MOTIVATION AND STRATEGIES FOR LEARNING 
IN TRADITIONAL-AGED COLLEGE STUDENTS: 
AN EXPLORATORY STUDY

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MOTIVATION AND STRATEGIES FOR LEARNING
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ABSTRACT

This exploratory study uses the 15 scales of the Motivated Strategies for Learning Questionnaire (MSLQ) to examine how traditional-aged college students in their first year of college compare with those who have persisted to their second year. In addition, the relationship of students’ motivation levels and use of learning strategies with student success and retention is examined. The goal of the study is to provide insights on how higher education administrators, faculty, advisors, and student development professionals can better help students learn and pursue their educational goals.
DEDICATION

To My Creator, Redeemer, King, and Friend who invented learning, gave me a love for it, and allows me to share it.

S.D.G
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One of the greatest blessings of my life is that I have always had the privilege of being part of loving and supportive communities, whether those were the loving parents and seven siblings of my childhood or the wide network of people who made it possible for me to climb Mt. Dissertation. So while arriving here is an accomplishment, it is one that I gratefully share with all those who helped me along the way. I’d like to acknowledge my gratitude to them here:

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>xv</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIST OF FIGURES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>xvii</td>
</tr>
</tbody>
</table>

## I. NATURE AND SIGNIFICANCE OF THE PROBLEM

- Statement of the Problem ........................................ 5
- Purpose of the Study ............................................. 9
- Research Questions .............................................. 10
- Research Design .................................................. 11
- Operational Definition of Terms ................................ 12

## II. LITERATURE REVIEW

- College Student Retention Theory ................................ 16
  - Model of College Student Departure: Tinto .................. 17
  - Student Involvement Theory: Astin ........................... 18
  - Student Attrition Model: Bean ................................. 20
  - Developments in Retention Research ............................ 21
  - A Psychological Model of College Student Retention .......... 33
- Motivation for Learning Theory .................................... 38
  - Cognitive Approach to Motivation ............................. 40
Metacognition ................................................................. 41
Self-Regulation ................................................................. 42
Self-Efficacy .................................................................... 43
Attribution Theory ............................................................ 47
Expectancy-Value Theories ............................................... 51
A Learning to Learn Course ............................................... 53
Achievement Goal Theory ................................................. 56
Components of Motivation Model ....................................... 59
A Taxonomy of Learning Strategies .................................... 63
The Motivated Strategies for Learning Questionnaire (MSLQ) .... 67
Research on Motivational Constructs ................................. 70
Intrinsic Goal Orientation and Extrinsic Goal Orientation ...... 70
Task Value ........................................................................ 76
Control Beliefs about Learning ........................................... 79
Self-Efficacy for Learning and Performance ....................... 81
Test Anxiety ..................................................................... 86
Research on Use of Learning Strategies .............................. 88
Rehearsal .......................................................................... 89
Elaboration ....................................................................... 91
Organization ..................................................................... 92
Critical Thinking ............................................................... 94
Use of the MSLQ ........................................................................................................ 136

Validity and Reliability of the Instrument ....................................................... 138

Construct Validity through Correlation .......................................................... 139

Construct Validity through Confirmatory Factor Analysis .............................. 142

Predictive Validity .............................................................................................. 143

Reliability through Cronbach’s alpha ............................................................... 145

Limitations of the MSLQ ................................................................................... 146

Data Collection Procedures ............................................................................ 149

Data Analysis Methods and Procedures ......................................................... 156

Descriptive Statistics ....................................................................................... 158

  Multivariate Analysis of Variance (MANCOVA) ........................................... 158

  Product-Moment Correlation Coefficients ..................................................... 159

  Multiple Regression ....................................................................................... 160

  Logistic Regression ....................................................................................... 161

Overall Quality of Research Design ............................................................... 161

Summary ........................................................................................................... 163

IV. RESULTS .................................................................................................... 164

  Introduction .................................................................................................... 164

  Response Rate ............................................................................................... 164

  Description of the Sample ............................................................................ 165
Research Question 1 ............................................................................................................. 167
Research Question 2 ............................................................................................................. 172
Research Question 3 ............................................................................................................. 177
Research Question 4 ............................................................................................................. 188
Summary ............................................................................................................................... 192
V. SUMMARY AND DISCUSSION ......................................................................................... 195
Introduction .......................................................................................................................... 195
Summary of the Study .......................................................................................................... 195
Limitations ............................................................................................................................ 201
Findings and Interpretations ............................................................................................... 203
   Findings from Testing Hypothesis 1 .................................................................................. 204
   Findings from Testing Hypothesis 2 ................................................................................ 209
Implications and Recommendations .................................................................................. 214
   Motivation for College Success Model .......................................................................... 216
   Strategies for College Success Model ............................................................................. 220
   Connection Point for Models ........................................................................................ 225
Suggestions for Future Research ....................................................................................... 228
Conclusion ............................................................................................................................ 230
REFERENCES ................................................................................................................. 231

APPENDICES .............................................................................................................. 253

APPENDIX A: MOTIVATED STRATEGIES FOR LEARNING

QUESTIONNAIRE ........................................................................................................... 254

APPENDIX B: PARTICIPANT ACKNOWLEDGEMENT LETTER AND

COUPON ....................................................................................................................... 268

APPENDIX C: SAMPLE MSLQ SCORE REPORT FOR STUDY

PARTICIPANT ............................................................................................................... 270

APPENDIX D: EMAIL COMMUNICATION TO REQUEST

PARTICIPATION ............................................................................................................. 274

APPENDIX E: CLASS VISIT HANDOUT ....................................................................... 276

APPENDIX F: REMINDERS OF REQUEST TO PARTICIPATE.................................... 278

APPENDIX G: PERMISSION LETTER FROM VICE PRESIDENT FOR

ACADEMIC AFFAIRS TO CONDUCT RESEARCH ON IWU

CAMPUS ...................................................................................................................... 283

APPENDIX H: IWU INSTITUTIONAL REVIEW BOARD RESPONSE TO

PROPOSED RESEARCH ............................................................................................ 285

APPENDIX I: PERMISSION FROM UNIVERSITY OF CHICAGO PRESS

TO REPRINT FIGURE 1 ............................................................................................... 287
APPENDIX J: PERMISSION FROM VANDERBILT UNIVERSITY TO REPRINT FIGURE 2 ................................................................. 289

APPENDIX K: PERMISSION FROM BILL MCKEACHIE TO REPRINT FIGURES AND TABLES AS NEEDED FROM NCRYPTAL PUBLICATIONS ................................................................. 291

APPENDIX L: PERMISSION FROM TAYLOR & FRANCIS GROUP TO REPRINT TABLE 3 ................................................................. 294

APPENDIX M: PERMISSION FROM SAGE PUBLICATIONS TO REPRINT TABLE 6 ................................................................. 296
### LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A Taxonomy of Learning Strategies</td>
<td>64</td>
</tr>
<tr>
<td>2. Structure of Motivated Strategies for Learning Questionnaire</td>
<td>69</td>
</tr>
<tr>
<td>4. Motivated Strategies for Learning Questionnaire Scales</td>
<td>132</td>
</tr>
<tr>
<td>5. Correlations among MSLQ Scales</td>
<td>141</td>
</tr>
<tr>
<td>6. Item numbers, Internal Reliability Coefficients, and Correlations</td>
<td>145</td>
</tr>
<tr>
<td>with Final Course Grade for MSLQ scales</td>
<td></td>
</tr>
<tr>
<td>7. Questionnaire Respondents and Response Rates</td>
<td>154</td>
</tr>
<tr>
<td>8. Data Analysis Methods for Current Study</td>
<td>157</td>
</tr>
<tr>
<td>9. Frequency Distribution of Participant’s Demographic Descriptors</td>
<td>166</td>
</tr>
<tr>
<td>10. Descriptive Statistics for MSLQ Scales by Class Level</td>
<td>169</td>
</tr>
<tr>
<td>11. Adjusted and Unadjusted Means for Freshmen and Sophomores</td>
<td>174</td>
</tr>
<tr>
<td>12. Effect Sizes of Significant Differences between Freshmen and Sophomores</td>
<td>176</td>
</tr>
<tr>
<td>13. Correlations between MSLQ Motivation Scales and Final Course Grade</td>
<td>178</td>
</tr>
<tr>
<td>14. Correlations between Learning Strategies Scales and Final Course Grade</td>
<td>179</td>
</tr>
<tr>
<td>15. Coefficients and Collinearity Statistics for Motivation Scales</td>
<td>182</td>
</tr>
<tr>
<td>17. ANOVA Summary Table for Motivation Scales</td>
<td>185</td>
</tr>
</tbody>
</table>
18. ANOVA Summary Table for Learning Strategies Scales.................................185
19. Multiple Regression Model Summary for MSLQ Motivation Scales..............187
20. Multiple Regression Model Summary for MSLQ Learning Strategies Scales.....188
21. Case Processing Summary for Logistic Regression....................................190
22. Classification Table for Logistic Regression.............................................190
23. Unusable Results Obtained from Logistic Regression with Too Few Cases......191
24. Major Findings from the Study.................................................................194
25. MSLQ Scale Categories and Corresponding Elements of Emerging Model.....214
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tinto’s (1987) Model of Institutional Departure</td>
<td>24</td>
</tr>
<tr>
<td>2.</td>
<td>Bean’s (2000) Psychological Model of College Student Retention</td>
<td>36</td>
</tr>
<tr>
<td>3.</td>
<td>Components of Motivation Model</td>
<td>60</td>
</tr>
<tr>
<td>4.</td>
<td>Motivation for College Success Model</td>
<td>217</td>
</tr>
<tr>
<td>5.</td>
<td>Strategies for College Success Model</td>
<td>222</td>
</tr>
</tbody>
</table>
Chapter I

NATURE AND SIGNIFICANCE OF THE PROBLEM

Increasing retention rates and bolstering the bottom line often seem to be the most important concern of many college and university administrators (Hoover, 2007). It appears to some that college education in the United States has come to be regarded as another consumer item (Fiske, 2008), and students have come to be regarded less as learners and more as “dollar signs” (Humphrey, 2008). Since the 1970’s, colleges and universities have established and come to rely upon their enrollment management departments to attract a certain number of students, making it possible for the university to maintain its tuition revenue and, thus, continue to operate (Bontrager, 2007; Humphrey, 2008). More charitably, another reason for the focus on retention rates is that institutions cannot fulfill their mission of providing students with a higher education if those students abandon their education in midstream (Bontrager, 2004).
Upon discovering attrition rates to be highest between the freshman and sophomore years (Levitz & Noel, 1989; Mallinckrodt & Sedlacek, 1987), much research was done to understand why first-year students leave college and what kinds of programs would help them stay. For example, various behavioral and social dimensions such as drinking, smoking, health-related quality of life, coping and social support were examined for their impact on student achievement and retention (DeBerard, Spielmans, & Julka, 2004; Wilcox, Wyne, & Fyvie-Gauld, 2005). Other studies have examined the effect of high school preparation, financial aid and first year performance on retention between the freshman and sophomore year (Herzog, 2005; Goldrick-Rab, 2007). Hodum and Martin (1994) describe the positive impact of a University 101 freshman seminar course designed at the University of South Carolina to help improve retention from the freshman to the sophomore year. And more recently, universities have combined curricular and co-curricular components to create comprehensive First-Year Experience (FYE) programs consisting of a 3-day series of workshops and social activities with the purpose of familiarizing students with one another, with faculty and staff, and with campus support services such as the campus library, tutoring services, and counseling centers (Schrader & Brown, 2008; Jamelske, 2009).

Tinto’s work (1975; 1982; 1987; 1993) on institutional departure did much to assist university personnel in understanding the conditions relevant to college student retention and achievement. Tinto’s model has been characterized as an
“interactionalist model of college student departure” (Kelly, Kendrick, Newgent & Lucas, 2007, p. 1022) because it posits that a complex variety of factors interact to create conditions under which students stay in college or leave. The model is organized into five categories. The first category is a student’s family attributes including the parents’ level of education, socioeconomic status, and parental expectations of the student. The second category of factors influencing student retention is the student’s prior qualifications or schooling, defined by their academic achievement at the high school level and the particular characteristics of that high school education. A third category is the student’s own individual attributes, skills, and abilities. Tinto’s model focuses specifically on race, gender, and academic ability. The fourth category is the formal and informal academic interactions the student has with faculty, either by means of the academic coursework requirements and the instructional strategies encountered or through contact with faculty outside of the classroom. The fifth and final category is the co-curricular activities or social support provided to the student. These activities and services include everything from participation in intramural sports and involvement in student organizations to spontaneous peer interactions in the residence halls or student union. According to Tinto (1993), the five categories together influence a student’s academic and social integration into the university. The degree to which a student is integrated then affects that student’s future decision concerning continuing at the university or departing. Tinto’s model was tested and generally supported in the earliest studies
(Terenzini & Pascarella, 1977; Pascarella & Terenzini, 1980). Subsequent work by Bean (1990) and Astin (1997) expanded on the model and contributed further to knowledge in this field.

Of the five categories described above affecting retention, the first three refer to characteristics or descriptors of students that are viewed as beyond the university’s control or influence (Schrader & Brown, 2005). Therefore, they often receive less attention by university personnel than the fourth and fifth categories, instructional and social support, which are considered to be the direct responsibilities of the university (Goenner & Snaith, 2004).

In an effort to apply emerging insights about student retention, colleges and universities instituted freshman seminar courses and advising programs to help address the unique challenges faced by the transition into college and throughout the first year (Lang, 2007; Jamelske, 2009). These programs take different forms including learning communities where first-year students are co-enrolled in several core courses, Summer Common Reading programs where all entering freshmen are assigned the same book to read before beginning their first year, and enhanced advising programs (Hunter, 2006). More specifically, the University of Connecticut instituted a program called “Finish in Four,” with the goal of helping students earn their diplomas within four years (UConn Wins 2006 Retention Award, 2007). Advisors in the program ensure that students are enrolling in fifteen credit hours per semester and taking courses in the right order to complete their selected major.
Many of these programs enjoyed success in raising retention rates after the freshman year (Gardner & Jewler, 1989; Levitz & Noel, 1989). The “Finish in Four” program described above was credited with raising the freshman retention rate from 86% in 1998 to 93% in 2005 (UConn Wins 2006 Retention Award, 2007). However, these programs are institutional programmatic efforts, operating externally to the student, that do not directly address factors internal to the student such as the motivational, cognitive, and academic beliefs and skills necessary for students to achieve and succeed in college (Svinicki, 1999; Bauer & Liang, 2003). These beliefs and skills include confidence in one’s ability to learn, preparing for tests by connecting ideas and concepts presented in class lectures, and managing one’s time and study environment.

Statement of the Problem

Recent research in the field of educational psychology suggests that beliefs held by students influence both student thinking and motivation (Pintrich 2004, Alderman, 2008; Eccles & Wigfield, 2002). Such work would seem to be promising for applied research designed to reveal student beliefs. One reason for the paucity of research done on how learner beliefs and skills relate to achievement and success may be the perceived difficulty of measuring such elusive constructs and concepts as self-efficacy, intrinsic motivation, and critical thinking in students. In contrast, ACT, Incorporated’s Research Services for Educators provides entering student profiles to client institutions concerning
students’ high school backgrounds, plans and goals, scores on the American College Test (ACT), predicted retention rates, and year-to-year trends in family income and high school grades (ACT, Inc., 2009). So while it may be easy to discover how many students did or did not continue in their college education from one year to another or to track upward or downward trends in grade point averages or in scores on standardized tests, it is not readily apparent whether the attrition rates or trends are related to the presence or absence of a student’s propensity toward test anxiety, amount of effort expended on a task, willingness to seek help, or other cognitive and motivational beliefs and skills. This is despite the fact that learner characteristics and the “motivation-related behavior” of students are more predictive of college student success than are scores on standardized tests (Moore, 2006; Svinicki, 1999).

Therefore, if it were possible to measure these constructs, university personnel would be better able to understand students’ beliefs and skill levels in areas critical to their success. Consequently, administrators and admissions personnel would be better able to predict success on the part of entering students. Instructors would be able to use teaching methods and assessment strategies matching the needs of the learner. Advisors could direct students toward resources for developing essential skills currently lacking. Student development professionals could better understand how their programs, interactions with students, and the campus environments they create, could lead students to the development of positive and helpful beliefs about themselves and
their ability to learn and achieve. Academic support specialists could design interventions and recognize adaptive and maladaptive beliefs about learning in the students they counsel or tutor. As this new knowledge was effectively applied, students would not only be more likely to persist and to graduate, but also be more likely to learn and leave college with the tools needed to continue learning (Svinicki, 1994; Kelly, Kendrick, Newgent, & Lucas, 2007; Hsieh, Sullivan, & Guerra, 2007).

An important contribution was made to solving this measurement problem and realizing these possibilities with the development of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1991). This instrument is predicated on several decades of research designed to identify those beliefs and skills that contribute to student achievement and success (Pintrich, Smith, Garcia & McKeachie, 1993). Pintrich, Smith, Garcia, and McKeachie (1991), a team of researchers at the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL) and the School of Education at the University of Michigan, developed the MSLQ in the early 1990’s. The instrument is comprised of six Motivation Scales and nine Learning Strategies Scales. The Motivation Scales include three Value components: Intrinsic Goal Orientation, Extrinsic Goal Orientation, and Task Value; two Expectancy components: Control Beliefs About Learning and Self-Efficacy for Learning and Performance; and one Affective component: Test Anxiety. The Learning Strategies scales are sub-divided into
five Cognitive and Metacognitive strategies: Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation; and four Resource Management Strategies: Time and Study Environment, Effort Regulation, Peer Learning, and Help-Seeking (Duncan & McKeachie, 2005).

An analysis of student responses on these fifteen scales has been used in a variety of contexts and with a variety of populations to yield new knowledge. The MSLQ has been used in studies involving adult learners in a CPR course (Hopstock, 2008), with pre-service and in-service teachers in Israel (Bierenbaum & Rosenau, 2006), and with community college students (Howey, 1999; Harris, Edmundson, & Jacobson, 2006). It has been used to understand student behaviors in distance education courses (Richardson, 2007; Bassili, 2008) and gender differences among learners (Bidjerano, 2005). And it has been used to investigate the impact of campus type on students (Jacobson & Harris, 2008). In addition, the MSLQ has been translated into Chinese and Spanish and validated for use in those languages (Duncan & McKeachie, 2005). Complementing the research done on and with the MSLQ, an additional body of research has formed that examines how the beliefs and skills measured by the MSLQ can be influenced, affected, and developed by university personnel in order to lead to increased success on the part of the student (Alderman, 2008; Pintrich, Smith, Garcia and McKeachie, 1993).

This study built upon that body of research by using the MSLQ to measure motivational, cognitive, and academic beliefs and skills that have an
established impact on first-year college student’s course grades and, therefore, their likelihood of academic achievement and graduation with a college degree. These beliefs and skills include: 1) the value students place on learning; 2) students’ expectancy of success in college; 3) students’ attitudes or affect; 4) students’ cognitive and metacognitive strategy use; and 5) students’ use of the resources available to them. The study examined the patterns of beliefs and skills in freshmen and sophomore students to discover if those who have persisted to a second year of college showed higher levels of belief or skill development. Scores on the fifteen scales of the MSLQ were compared to high school grade point averages and final course grades and were examined for their relationship with persistence into subsequent college semesters. The initial survey provided an overall baseline of student skill levels at the university which can equip instructors, advisors, and other providers of student support services to more effectively enhance the instruction and services they are providing in light of the particular needs of their students. It is hoped that the results will eventually point the way to mechanisms that result in higher student achievement leading to increased retention and student success.

Purpose of the Study

The purpose of this study, therefore, was to investigate the pattern of motivational, cognitive, and academic beliefs and skills students bring to or develop during their first year of college at a private, liberal arts university in the
Midwest, and examine if and how these patterns differ between freshmen and sophomores co-enrolled in sections of the same course. The intent was to provide valuable information to that university’s administrators, instructors, advisors, and student development professionals concerning how to achieve their goal of increasing student success and retention by supporting students’ development of beliefs and skills necessary for that success.

Research Questions

This study sought to answer the following research questions:

**Research Question 1:** What pattern(s) of motivation and what use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

**Research Question 2:** After controlling for prior achievement as measured by high school grade point average (GPA), what similarities and differences in the patterns of motivation and use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

**Research Question 3:** Is there a significant relationship between motivation or use of learning strategies and student achievement as measured by final course grade?

**Research Question 4:** Are MSLQ scale scores significant predictors of college student retention/persistence?
Research Design

This exploratory study used a cross-sectional survey design in which the Motivated Strategies for Learning Questionnaire was administered during the Fall 2010 and Spring 2011 semesters to almost 100 freshmen and over 100 sophomores co-enrolled in sections of a course required of all students at a private, liberal arts institution in the Midwest. The cross-sectional design fits the exploratory nature of the study. While a cross-sectional design precludes measuring change, it enables the researcher to collect data on several variables at one time from a large number of participants (Mertler, 2005).

The resulting data has begun to reveal insights into the motivational, cognitive and academic skills of freshmen and sophomore students and how freshmen and sophomore skills may differ one from the other. Moreover, a comparison of scores on the fifteen MSLQ scales with high school grade point averages (GPAs) and final course grades was examined for any consistent relationships. Further, the findings have begun to suggest directions for the development of effective supports to help students develop their motivational, cognitive and academic skills with the goal of increasing student success and achievement, which may well lead to increased student retention between the freshman and sophomore years.
Operational Definition of Terms

Because the following terms are used often throughout the manuscript, they are operationally defined below.

*Freshman*-A college or university student who has completed 0-28 credit hours toward a degree (“IWU Catalog,” 2011).

*Sophomore*-A college or university student who has completed between 29 and 59 credit hours toward a degree (“IWU Catalog,” 2011).

*Retention*-A measure, usually expressed as a percentage, of the number of students who achieve course credit or a degree in comparison to the number of students who register for the course or enroll in the degree program (Ashby, 2004).

*Persistence*-A measure, usually expressed as a percentage, of the number of students at a university who continue to be enrolled at that university or at another institution of higher education (Leppel, 2002).

*Traditional-Aged College Student*-A college or university student age 23 or younger, usually indicating that he or she enrolled in college within a year of graduating from high school (Spitzer, 2001).

*Intrinsic Goal Orientation*-“The desire to work because you enjoy the challenge of learning, you are genuinely curious, or you enjoy the feeling of understanding” (VanderStoep & Pintrich, 2003, p. 276).

*Extrinsic Goal Orientation*-“The desire to work because you appreciate the external rewards” (VanderStoep & Pintrich, 2003, p. 276).
**Task Value.** “The extent to which tasks are perceived as interesting, important, useful and worthwhile” (VanderStoep & Pintrich, 2003, p. 278).

**Control Beliefs about Learning.** “The extent to which you believe your efforts will result in positive outcomes” (VanderStoep & Pintrich, 2003, p. 275).

**Self-Efficacy.** “Self-appraisal of one’s ability to master a task” (VanderStoep & Pintrich, 2003, p. 277).

**Test Anxiety.** “Nervous or anxious feelings during an exam or test; related to poor performance” (VanderStoep & Pintrich, 2003, p. 278).

**Rehearsal.** “A low-level learning strategy that involves repeating information until it has been memorized” (VanderStoep & Pintrich, 2003, p. 277).

**Elaboration.** “The process of building connections and associating information with material that is meaningful to you in order to achieve sophisticated understanding” (VanderStoep & Pintrich, 2003, p. 275).


**Critical Thinking.** “The ability to use acquired knowledge in flexible and meaningful ways, through understanding the problem or issue, evaluating evidence, considering multiple perspectives, and taking a position” (VanderStoep & Pintrich, 2003, p. 275).
Metacognitive Self-Regulation—“Using both skill and will in learning; actively planning, monitoring, and controlling your own learning or behavior” (VanderStoep & Pintrich, 2003, p.275).

Time Management—Efficiently and effectively allocating and using available time so as to increase one’s productivity or success (VanderStoep & Pintrich, 2003)

Study Environment Management—Efficiently and effectively choosing and using study locations so as to increase one’s productivity and success (VanderStoep & Pintrich, 2003).

Effort Regulation—“Persistence in the face of difficulty or boredom” (VanderStoep & Pintrich, 2003, p. 276).


Help-Seeking—“Using the resources of more competent people who are available to you” (VanderStoep & Pintrich, 2003, p. 276).
University personnel are charged with helping students to learn new knowledge, skills and attitudes and make a meaningful contribution to society. Their ability to do this is often measured by graduation rates and degrees attained. Consequently, it has become important for them to know what keeps students in college and leads to their success. A major factor in students’ success is the beliefs they have about learning which, in turn, influence another major factor in their success—the learning strategies they adopt and use. This study sought to identify those beliefs and skills that are essential to student success and to their progress toward a degree. The research focused specifically on traditional-aged first-year students (freshmen) and second-year students (sophomores) in an effort to establish a baseline skill level that can begin to reveal what beliefs and skills they bring to college and what beliefs and skills they may develop through their first year of college.

This review of the literature links theories and models related to student persistence and retention with social cognitive theories of student motivation for learning and achievement. It explores how the body of knowledge about
motivation and use of learning strategies can shed light on retention and student success issues. Moreover, it compares traditional predictors of student success, such as high school grade point average (GPA) with the motivational and cognitive beliefs and skills measured in the MSLQ and their effect on student success.

**College Student Retention Theory**

Retention and student success are interrelated concepts. Students cannot perform well academically or graduate with a degree if they do not stay in college. On the other hand, if students perform well academically, they are more likely to persist in college (Ruddock, Hanson, and Moss, 1999). Therefore, concern for student success and achievement must be linked to concern for persistence and retention rates.

In recent years, institutions with higher retention and graduation rates are beginning to be seen as superior to those with lower rates (Astin, 2005-2006; Goenner & Snaith, 2003) despite the fact that such beliefs may be unfounded (Astin & Oseguera, 2004). This, combined with the dependence of many colleges and universities on tuition dollars to generate the needed revenue to continue operations (Bontrager, 2007; Humphrey, 2008), has created a focus on retention and graduation rates (Hoover, 2007).
Model of College Student Departure: Tinto

The model that has served as a theoretical framework in most studies of retention is the Model of Student Departure developed by Tinto (1975, 1987, 1993; Metz, 2004; Hutto, 2002). His model originates in the work of Spady (1970), a sociologist who approached the phenomenon of students dropping out of college as a cause-effect relationship. The variables he identified to be at work in a student’s decision to leave college were the student’s family background, socioeconomic status, ability, and academic performance in college.

Tinto (1975) posited a theoretical model dividing these variables into two major components: 1) the characteristics and disposition of the student and 2) the student’s experiences at the institution. The first component encompassed pre-college entry factors such as sex, race, family background, socioeconomic status, high school achievement, scholastic aptitude and prior experiences. These combined to form particular intentions and goals for coming to college and provided particular levels of commitment to those goals and to the institution itself. In Tinto’s theory, the stronger a student’s goals and commitments, the more likely that student would be to persist. These goals and commitments, however, would be strongly affected by the second major component of the model, the student’s experience at the institution. The more rewarding a student’s experiences with grades, intellectual development, and interactions with fellow student and faculty, the more likely that student would be to persist.
About the same time, Astin (1975) published a comprehensive overview of the relationship between financial aid and student persistence and over the next decade developed his signature Student Involvement Theory (Astin, 1984). This theory proposes that the key to student retention and achievement is student involvement, defined as the degree of energy, both psychological and physical, devoted to an academic experience. For Astin, involvement is distinguished from motivation by its emphasis on the behavioral outcome stemming from an internal state and “is more open to direct observation and measurement than the abstract psychological construct of motivation” (Hutto, 2002, p. 14).

The development of Student Involvement Theory led to a systematic investigation of various kinds of experiences and their impact on student success and retention including the number of hours students spent studying, the effectiveness of their study habits, the effort applied to their coursework, and their interest in it (Metz, 2004). In 1975, Astin had published Preventing Students from Dropping Out, which explored the effects of student characteristics, financial aid, employment, student’s place of residence, and institutional type on a student’s decision to leave college. The book ends with detailed Worksheets for Predicting Chances of Dropping Out intended for use by “policy-makers, administrators and students to compute measures of dropout-proneness for any individual student or any group of students” (p. 183). The content of this book
and Astin’s Student Involvement Theory became a theoretical framework for further research on student retention and achievement in college (Metz, 2004).

While Astin’s theory was being developed and his book written, Pascarella and Terenzini (1980) began testing and validating Tinto’s model. In a longitudinal study, they administered a questionnaire to 1,905 freshmen. The instrument contained items categorized into five scales: 1) peer-group interactions, 2) interactions with faculty, 3) faculty concern for student development and teaching, 4) academic and intellectual development, and 5) institutional and goal commitments. The results of the study supported Tinto’s model, generally finding relationships where one would expect to find them and accurately identifying students’ likelihood of dropping out of college.

Subsequently, Pascarella and Chapman (1983) conducted a study on freshmen at four different types of institutions. The findings here also supported the model with those freshmen students showing higher levels of social integration at all types of institutions, though most markedly at the liberal arts and residential institutions, being more likely to persist. At the two-year commuter institutions studied, however, persisters and withdrawers both tended to have less contact with faculty and with fellow students. From here, Pascarella (1986) began using the model to study retention at community colleges and Fox (1986) applied the model to study academically underprepared students.
In the early 1980’s, John Bean developed the Student Attrition Model that, while based on the work of Spady, Astin, and Tinto, also drew analogies between leaving college and leaving the world of work. Bean’s critiques of existing research included the fact that most of the studies done following Tinto’s work used simple correlation methods and were thus unable to make causal connections between various factors and a student’s likelihood of dropping out (Bean, 1980). Moreover, because many of the variables in the model fell into broad clusters such as personality dispositions or moral values and defied the kind of definition needed to use path analysis methods, it was not possible to ascertain which particular variables were significant. Bean’s model sought to avoid these problems and measured twenty-eight well-defined variables, using path analysis methods to determine causal connections between a particular characteristic or “determinant” (Bean, 1980) and dropping out of college. He included attitudinal variables not found in Tinto’s model such as a student’s personal evaluation of the quality of the institution and his or her satisfaction with it. His initial test of his model yielded important findings. He established both that males and females left college for different reasons and that his model accounted for 21% of the variance in dropout rates for females and 12% for males. Moreover, he was able to show that opportunity variables, referring to alternative roles filled by students such as a job or a family, affected a student’s institutional commitment. He summarized his study by creating profiles of a
typical male dropout and a typical female dropout and provided recommendations for reducing student attrition on this basis.

Bean went on to collaborate with Metzner, adding the psychological factors of stress and family outcomes to his model and testing it on non-traditional students (Bean & Metzner, 1985; Metzner & Bean, 1987). An important emphasis in Bean’s approach to measuring student persistence was the idea that beliefs shape attitudes and these attitudes shape behavioral intent. In addition, he stressed the importance of factors external to the institution in their influence on both attitudes and behaviors (Cabrera, Nora, & Casteneda, 1993).

Developments in Retention Research

Tinto’s work had continued during this time as well; in response to his critics, he revised and expanded his model. While criticizing other models for being atheoretical, in his book Leaving College: Rethinking the Causes and Cures of Student Attrition (1987) he drew connections between his model and the theories of Durkheim (1961) and Van Gennep (1960). Durkheim, commonly considered the father of sociology, created a theory regarding departure from a community through suicide. Tinto analogized that departure from college may follow the same pattern that Durkheim called the “egotistical” type of suicide. In egotistical suicide, a person’s decision to end his or her life is related to his or her failure to successfully integrate and establish membership in a community
within society. In a similar way, Tinto theorized, a student’s departure from college stems from his or her failure to integrate, academically and socially, into the college or university community.

Van Gennep’s Rites of Passage theory explained for Tinto how that integration should have occurred. Van Gennep, a Dutch anthropologist, posited that individuals go through three stages in their passage from youth to adulthood: separation, transition, and incorporation. Similarly, proposed Tinto, students need to go through these same three stages when entering college. Students must successfully separate from their families, high school and home communities; transition into a new community and learn its ways and expectations; and become incorporated into that community by establishing full membership, often through a special ceremony delineating the rewards and responsibilities of membership.

The desired outcome for students, then, which would lead to their persistence, was integration, both academic and social, into the life of the university community (Tinto, 1987). According to Tinto, policies and programs at institutions of higher education should be designed with this integration in mind; poor retention rates could be tied to failure on the part of students to achieve this integration. Because of the stress placed on the concept of integration, Tinto’s model was often referred to as the Student Integration Model.
In Tinto’s 1987 book, three major philosophical points were emphasized (Hutto, 2002). First, because what a person perceives is real and has consequences, a student’s perception of an interaction is as important as the interaction itself. Second, the model is an interactional systems model because the institution and the individual are constantly interacting with one another and the quality of these interactions bears directly on the student’s decision to stay or go. And third, while it may be possible to persist while experiencing academic or social integration alone, both types of integration are important factors in student persistence.

The revised model set out in this book (see Figure 1) provided five major theoretical bases for persistence research: psychological, societal, economic, organizational and student-institution interaction, leading to a strong foundation for future research (Metz, 2004) and laying the groundwork for his model to reach near-paradigmatic status in the literature (Baird, 2000). Tinto (1987), however, emphasized the role of the institution, focusing the rest of his 1987 book on institutional components essential to the integration process—enrollment management, orientation programs, counseling and advisory programs, and financial aid—and how these components could be used to improve retention rates.

Subsequently, a report of a longitudinal study over eight semesters conducted by Galicki and McEwen (1989) was published. This study
investigated persistence among African American students at a large institution. They found that students living on campus in residence halls showed higher persistence than those living off-campus. Furthermore, Stage (1989) found that among the many variables with the potential to influence persistence, one such variable was a student’s motivational orientation or reason for enrolling in
college in the first place. She classified motivational orientation in three
categories: Certification, Cognitive, and Community Service, and explored how
these orientations affected persistence. She found marked differences among the
three groups of students and concluded that psychosocial influences were an
important area of study within retention research.

Pascarella and Terenzini (1991) responded to these studies with several
recommendations for further research in regard to Tinto’s Model. They noted
that two-year colleges were excluded from the research and suggest that
institutional attributes, race, gender, college major and financial aid needed to be
included as variables in the model and studied for their contributions. They also
recommended focusing on the interrelationship of academic and social
integration as a factor in student retention and emphasized the role of peer,
faculty and advisor relationships.

Aspects of their comments were reflected in criticism from Tierney (1992),
who stated that Tinto had misrepresented Van Gennep with harmful
consequences for minorities. He went on to assert that because of the emphasis
on institutional variables, findings from studies using the model were not
generalizable to various institutions and students. Furthermore, he maintained
that the model was too broad and did not provide examples related to non-
traditional student populations, including “stopouts,” students who put their
education on hold but would later return and who were beginning to be studied
In this environment, a comparison of Bean’s Student Attrition Model and Tinto’s Student Integration Model was published by Cabrera, Castenada, Nora, and Hengstler (1992). The study sought to show where the models diverged and converged with several important results. Upon completion of the study, the authors concluded that both models appropriately asserted that a complex interaction of personal and institutional factors combine to affect college persistence. Likewise, both models were commended for highlighting the need for a good match between the student and the institution in creating a student’s intent to persist. In addition, the authors declared both models useful for investigating attrition at both traditional and urban institutions.

But, Tinto’s model was judged to be more robust in terms of the number of hypotheses validated with a total of seventy compared to a total of forty for Bean’s model. On the other hand, Bean’s model was able to account for more variance in the factors Intent to Persist (60.3 % for Bean’s model and 36 % for Tinto’s) and Persistence itself (44 % for Bean’s model and 38 % for Tinto’s). In other words, the additional variables found in Bean’s model, particularly parental encouragement, support from friends, and finances, made Bean’s model more able to explain different student’s intentions and decisions concerning continuing in college or leaving.

This comparison study also found a great deal of overlap in the two models but provided support for Bean’s claim that “the influence of environmental, organizational, and personal variables on Persistence is more
likely to be indirect, mediated through behavioral intentions to stay or remain at the institution” (Cabrera, Casteneda, Nora & Hengstler, 1992, p. 159). The authors concluded that the two models were complementary and in subsequent articles (Cabrera, Nora & Casteneda, 1993), proposed a new model integrating the two.

Around this same time, a variety of smaller studies focusing in on particular aspects of each model were coming to completion and adding to knowledge in the field. Bonham and Luckie (1993) contended that when studying persistence among community college students, it was particularly important to differentiate among stopouts, those leaving college temporarily; dropouts, those leaving college for good; and optouts, those who left after attaining the goal they set out to accomplish though that goal was short of a degree. Ryland, Riordan, and Brack (1994) found that self-confidence among students leaving college was low even when measures of those same students’ global confidence were high. Gerdes and Mallinckrodt’s (1994) longitudinal study of attrition revealed that a student’s personal adjustment was equally as important as his or her integration into campus life and suggested separate interventions for students who were struggling academically and those who were not. Research filling in the gaps in regard to retention at two-year colleges was conducted by Windham (1994) and Okun, Benin, and Brandt-Williams (1996), suggesting that non-traditional students experience integration processes
differently and that total credits earned per term and grade point averages are significant variables for persistence at community colleges.

An important development in the mid-1990’s was the work of Pajares (1996) applying Bandura’s (1977) concept of self-efficacy to academic settings. Self-efficacy refers to a person’s beliefs about his or her ability to perform a task. While not engaged specifically in studying retention in higher education, he found that greater self-efficacy was linked to greater effort, persistence and resilience on the part of the learner. It would be a few more years until the concepts of retention and self-efficacy would be linked. (Kelly, Kendrick, Newgent, & Lucas, 2007; Braxton, 2000).

During this time, Tinto had published a second edition of Leaving College: Rethinking the Causes and Cures of Student Attrition (1993) and turned his attention to research on learning communities and first year experience courses and programs, applying his sociological perspective to the question of best practices for realizing the academic and social integration called for in his model. He widened his focus from persistence alone to include Astin’s concept of involvement, which he saw as occurring on different levels. Both academic and social integration could occur at formal and informal levels. For example, academic integration at the formal level would include classroom instruction, laboratory work, or small group projects while informal academic integration occurred through interaction between faculty and students outside the classroom. Additionally, social integration included a student’s formal
involvement with clubs and organizations, athletics, intramurals or other co-curricular activities. Informal integration into the institution’s social systems occurred through daily activities and interaction with others on campus (Smith, 2002). Tinto (1998) stressed the need to apply the learning from student persistence research in educational reform, particularly at two-year colleges. Tinto also asserted that, while both academic and social integration are important, academic integration seemed to have more influence on a student’s persistence.

This was followed closely by studies showing the effect of various intervention strategies on persistence and retention. A study by Stovall (1999; 2000) demonstrated that participation in a student success course influenced the persistence rates of students at a community college. In another study, Coppola (1999) found that demographic data could be used to identify students at-risk for dropping out in order to provide early intervention programs to help them persist.

But by the turn of the century, many scholars and researchers were calling for revisions to Tinto’s model or finding it to be inadequate. A longitudinal study by Beil, Reisen, Zea, and Caplan (1999) of first-year student retention revealed that social and academic integration do affect retention but do so indirectly. While integration affects a student’s commitment level to the institution, it is the level of commitment that directly affects retention.
Ruddock, Hanson and Moss (1999) urged looking beyond interactional theories of student departure in order to find other variables or factors that could be related to retention rates. Particularly, they were interested in further study on the already established (Hanson & Swann, 1993) relationship between academic performance and a student’s decision to leave college. They matched and compared 747 Leavers with 746 Stayers on several pre-college characteristics (high school rank, SAT Total score, major, ethnicity, gender) and early experiences with campus life (on or off-campus housing and attendance at freshmen orientation). They then compared responses on a fifty-five item questionnaire and obtained student record information concerning the students’ GPAs, enrollment and performance in introductory or gatekeeper courses, and academic status at point of leaving. The questionnaire also contained seven background questions relating to the student’s involvement at the university. Through factor analysis, Ruddock et al. identified six factors associated with predicting staying or leaving, three of which were statistically significant. In order, they were Personal Academic Responsibility, Sense of Belonging/Prestige, Diversity, Goals, Faculty/Staff, and Finances. In the measures of Personal Academic Responsibility, Stayers agreed more often that they performed academically as well as they thought they would, while Leavers were more likely to agree that the adjustment had been more difficult than expected, were not sure how to study when they first arrived, and that they were so involved with friends that they did little beyond socialize. The Sense of Belonging/Prestige
scale showed that Stayers felt they belonged, thought it was important to graduate from that university, and had easily made friends among their peers. Leavers, however, agreed that they had misgivings about their decision to attend. On the third significant factor, Diversity, Stayers more often agreed that they had been observers of discrimination toward minority students but that the university was sensitive to the needs of those minority students. The questionnaire also asked open-ended questions pertaining to reasons that students left and what could have been done to help them stay. The responses given most often fell into the categories of academic and personal problems.

Another outcome of this comprehensive study by Ruddock et al. was the finding that both Stayers and Leavers found to be in good academic standing provided similar responses to the items on the questionnaire. The same was true of Leavers on academic probation and leavers who had been dismissed for academic reasons. The authors state that the most remarkable finding from their study was that, although Stayers and Leavers were quite similar on many of the measures, Leavers lagged dramatically behind the Stayers academically. 51.4 % of the Leavers had grade point averages below 2.00 while the same was true of only 4.3 % of the Stayers. There was also a strong relationship between grade point average and the Personal Academic Responsibility factor. This study provided strong support for the assertion that formal academic integration may have more influence than social integration on persistence and furthered the
argument that more than the current interactionalist models were needed to understand student attrition.

Mashburn (2000) advanced this line of thinking by proposing student attrition as the final outcome of a psychological process. He claimed, like Bean, that college students left higher education for similar reasons that employees left jobs. He adapted the model of employee turnover first developed by Hom, Caranikas-Walker, Prussia and Griffeth (1992) and posited that a student’s dissatisfaction led to withdrawal cognitions such as thoughts of quitting, intentions to search for alternative role or environment, and intentions to drop out. These cognitions, in turn, led to the student dropping out of college. His study supported the assertion that satisfaction and dropout are mediated by withdrawal cognitions.

Around the same time, Braxton, an associate professor of education at Vanderbilt University edited a volume of essays called Reworking the Student Departure Puzzle (2000). In his introductory comments, he summarized his earlier research with colleagues Sullivan and Johnson (Braxton, Sullivan & Johnson, 1997) in which the team had reviewed the formulations of Tinto’s theories related to student departure and assessed the empirical support for the thirteen testable propositions found in them. Braxton et al. found that “four propositions received strong empirical backing by multi-institutional tests, whereas single-institutional appraisals provide strong empirical affirmation for five propositions. As a consequence, Braxton, Sullivan, and Johnson (1997) conclude
that Tinto’s theory is partially supported and lacks empirical internal consistency (p. 3).” Therefore, Braxton (2000) proposed two possible reactions. The first one would be to seriously revise the theory; the second would be to abandon it altogether. Each chapter of the book describes proposed revisions to Tinto’s model using economic, psychological, organizational and cultural approaches.

Tinto (2000) himself contributed a chapter, continuing to take a broad, sociological view of retention issues; focusing on the value of learning communities; and lamenting that we have overlooked the ways that students’ classroom experiences affect student departure.

A Psychological Model of College Student Retention

Bean’s contribution to the volume, co-written with Eaton, takes the form of expanding Tinto’s work into a primarily psychological model. Bean and Eaton (2000) conceive of a student’s departure from college as a behavior. As such, they state that this behavior must be preceded by cognitive processes which then result in attitudes about oneself. Therefore, behaviors are connected to attitudes. They proceed to describe four families of theories from educational psychology that can expand upon the sociological constructs in Tinto’s model and, when applied, can be useful in retention research: attitude-behavior theory, coping strategies theory, self-efficacy theory, and attribution theory. The first two of these will be briefly described here. The second two, also briefly
described here and which bear directly on the questions explored in this study, will be discussed in more detail later in this chapter.

Attitude-behavior theory is based on the work of Fishbein and Azjen (1975) and links beliefs, attitudes, intentions, and behavior. This theory applied to retention would posit that the behavior of remaining enrolled in college would result from an intention to persist in college. This intention would stem from attitudes, such as in this case a favorable impression of the institution and satisfaction with it. This attitude would be developed based on a normative belief, often shaped by parents, family, or peers. For example, a parent’s belief that a college is a good one because s/he graduated from that institution could be transferred to the student. Other such normative beliefs can also exist concerning a student’s ability to succeed, the value of the education provided by that institution in pursuing future goals, or what makes one institution better than another (Braxton & Eaton, 2000).

Coping behavior theory, first developed by Lazarus (1966), refers to a person’s reactions to stress, or threats coming from their environments. A person can respond adaptively, improving or defusing the situation. This would be described as positive coping and has the goal of reducing stress. Applied to college student departure or persistence, students who cope well with the new and often stressful environment of college would achieve greater levels of academic and social integration and be less likely to drop out (Braxton, 2000).
Moreover, individual personality traits may make a student predisposed to more healthy patterns of coping behavior (Bauer & Liang, 2003).

Albert Bandura (1982; 1986; 1997) originated self-efficacy theory, which has gained wide acceptance and been used and developed in many studies on academic performance (Pajares, 1996). Self-efficacy refers to a person’s beliefs about his or her own ability to do a particular task. When applied to student persistence, high levels of self-efficacy in academic tasks would lead to better classroom performance and, therefore, higher levels of academic integration. Similarly, high levels of self-efficacy related to particular situations common to living and interacting with peers may lead to better social integration. A better integrated student would then be much more likely to stay in college (Braxton & Eaton, 2000).

The fourth psychological theory forming a basis for Bean and Eaton’s (2000) model would be attribution theory. This theory, developed by Weiner (1986) refers to the explanation given for success or failure in a given situation. Attribution incorporates 1) an individual’s locus of control, whether the cause of one’s success is thought to stem from inside oneself or from people or circumstances outside of oneself, 2) how stable or changeable that cause is thought to be, and 3) how much control a person thinks they have over those causes (Eccles & Wigfield, 2002). In the context of student departure, an external locus of control has been found to increase a student’s likelihood of dropping out of college, whereas an internal locus of control seems to translate to greater
institutional commitment, one of desirable outcomes in Tinto’s model (Guarino & Hocevar, 2005).

Thus, the model proposed by Bean and Eaton (p. 57, 2000; see Figure 2), builds upon these theories. In the model, entry characteristics are greatly expanded to include past behavior, personality, initial self-efficacy and attributions, normative beliefs, coping strategies, and motivation to attend in addition to Tinto’s original category of skills and abilities. The model diagrams

![Figure 2: Bean’s (2000) Psychological Model of College Student Retention](image)

the way bureaucratic, academic, and social interactions as well as interactions with entities outside the institution (e.g., family) lead to the psychological outcomes of self-efficacy assessments, coping processes, and attributions. These psychological outcomes, in turn, lead to academic integration or performance and to social integration which translate into a student’s sense of institutional fit and commitment. This, according to Bean and Eaton, results in an intent to persist and, ultimately, persistence.

The case for adopting a psychological model and focusing future retention efforts on improving academic performance is forwarded by subsequent research. After five years of research on eight inter-related questions, Ryan and Glenn (2002) conclude that, at their institution, “a strong focus on developing academic competency is our best strategy for increasing the academic motivation and persistence of our freshmen. This approach has produced far greater retention returns for us than did the customer-satisfaction approach that guided our earliest efforts. We suspect that one reason for this effect is that learning-strategies training enhances the academic self-efficacy of our students (p. 321).”

Herzog (2005) furthers this case, stating that three areas in retention scholarship require additional attention and development. First, most of the research comes from an institutional perspective, focusing on whether a student is retained or not and therefore misses those students that transfer to another institution. Second, the way financial aid is treated in retention models looks only at financial aid received in the current year and not on offers of future
financial aid or scholarships which affect students’ enrollment decisions. Third, and most importantly, while the retention models include a large number of variables, they all come from interactionalist theories that do not adequately consider pre-college preparation and its effect on retention. Because so many post-secondary students come to campus underprepared, this has dramatic effects on retention and these models do not measure or account for student’s classroom experiences on persistence. Herzog advocates shifting focus to these academic and curricular experiences with their strong relationship to student’s decision to stay, drop out, or transfer elsewhere.

The work of Tinto, Astin, and Bean has created an anchor point for much research about college student attrition. While some continue to study the effects of institutional variables on persistence (Liu & Liu, 2000), the future direction for research seems to be a focus on student’s experiences, both in and out of the classroom, and how those experiences affect their beliefs about themselves and their ability to learn and succeed (Kelly, Kendrick, Newgent, & Lucas, 2008; Herzog, 2005; Ryan & Glenn, 2002). But no matter the direction of future research, in an era of accountability at all levels of the education system, retention research will continue (Metz, 2004).

Motivation for Learning Theory

As focus in retention research shifts to students’ academic experiences and university personnel respond to a new era of accountability by turning their
attention to college student learning, a fruitful place to look for both inspiration and practical strategies is the field of educational psychology and, more specifically, the body of research on college student motivation for learning. Motivation can be defined as “the process of initiating, sustaining, and directing activity” (Wittrock, 1986, p. 304). Studies of motivation applied to college student learning focus on why and how students begin, continue and develop in their use of learning strategies and ability to learn.

McKeachie (1961) began exploring this area in the 1960’s, seeking to discover which variables would predict college students’ behavior and which factors motivated students to achieve. But McKeachie wanted to study this in a way that would provide useful information for teachers and for students themselves. So the focus of the research was not only student motives but also what teaching methods and classroom environment would activate those motives and what strategies for learning the student would choose and use. In this way the research built upon the prior work of Atkinson (1958) who had developed categories of motives—affiliation, power, and achievement—and investigated how they operated in a classroom setting and their effect on students’ course grades. In this early research and writing, McKeachie (1961) also considered anxiety and its effect on motivation and drew a distinction between intrinsic and extrinsic motivation. This led to the conclusion that motives do indeed affect learning in different classroom situations even though they affect different individuals in different ways. Therefore, individual
differences, such as previous educational experiences, skills, abilities, and motives, were important for understanding and predicting behavior in educational settings.

_Cognitive Approach to Motivation_

McKeachie’s initial work was being done when the behaviorist model of motivation and learning was dominant and researchers in the field of psychology were stressing observable, measurable, and repeatable events so as to gain acceptance for the field as a science (Svinicki, 1999). The behaviorist model defines behavior as a response to stimuli in the environment. So, while the influence of this model is seen in McKeachie’s work, where the external context of classroom setting and teaching methods are stressed in their influence on student learning, McKeachie also emphasizes individual learner differences, a shift in focus that would not be reflected in most research in the field until the 1970s and 1980s.

During these two decades, a cognitive view of motivation for learning emerged. It began as a mechanistic model that construed learning as the structuring and restructuring of memory. The learner, previously not considered in behaviorist models, was beginning to be part of the learning equation because researchers realized the influence of prior knowledge and the schemata, or structures of knowledge, that the learner brought to the learning task (Svinicki, 1999). As research progressed, learning began to be viewed as a process of
information processing, or storage and retrieval of information from the memory. This elevated the view of the learner still more, as the learner’s full participation was required to direct this process of storage and retrieval. Thus, metacognition, or the ability to think about one’s thinking and to direct it, began to be studied.

**Metacognition**

John Flavell (1979), working at Stanford University, proposed a model for understanding metacognition. He described metacognition as “the monitoring of a wide variety of cognitive enterprises [which] occurs through the actions of and interactions among four classes of phenomena” (p. 906). These classes of phenomena were metacognitive knowledge, metacognitive experiences, goals (or tasks) and actions (or strategies). Metacognitive knowledge, in Flavell’s paradigm, referred to a complex interplay of thoughts or beliefs concerning the person, the task, and the strategy. For a hypothetical student named Mike, an example of such metacognitive knowledge in a learning setting would be that because he believes science is not his strongest subject (a belief about the person), he needs to review his physics notes each evening (a belief about strategy) in order to pass his courses with good enough grades to keep his scholarship (a belief about the task).

In Flavell’s (1979) model, this metacognitive knowledge can influence metacognitive experiences. Metacognitive experiences are short or lengthy times
of confusion, wonder, doubt, or disappointment. For example, Mike might struggle through a physics exam, knowing he had not followed through on his intention to regularly review his notes. While working through some particularly difficult problems, he recalls working on similar problems in a review session with peers in the same class. He is surprised to receive high marks on the exam and begins to think about possible causes for this outcome.

Metacognitive experiences can lead a person to revise the other three aspects of the model—their knowledge, goals or actions. For example, after Mike’s experience with his physics exam, he might begin to believe that he is, after all, better at physics than he had thought, that study groups are a good learning strategy for him, and keeping his scholarship is more likely than previously believed. For Flavell (1979), the distinction between cognition and metacognition comes in its purpose. Cognition is used to process and learn the material while metacognition is used to monitor the processing and learning of the material. He cites evidence that metacognition can be taught and asserts that there cannot be too much instruction in this area. The endpoint of such instruction, in his view, would be of great benefit to society as people learn how to make better decisions and how to learn more effectively in school settings.

*Self-Regulation*

Another scholar concerned with the effect of educational practices on society was Thomas (1978). Thomas pointed out the flaws in many views of
education popular at that time. He suggested that these views resulted in permissive classroom environments, less time on task for students, decreased achievement on standardized tests, and decreased motivation for learning in students. He reviewed the literature on student motivational characteristics and self-management strategies and concluded that more emphasis needed to be placed on student responsibility and self-management. He coined the term “self-regulated learning behaviors” (Thomas, 1978, p.49) and suggested students should be taught to set goals and instructed in how to plan, manage, monitor and evaluate their own learning. While his work focused on elementary and secondary school students, it did much to emphasize the learner as an actor or agent in the learning process.

Self-Efficacy

Other work being done around this time by another Stanford scholar reflected and furthered this view of the learner. Bandura, a Canadian-born professor of psychology, published his seminal work on self-efficacy in 1977 (Bandura, 1977). This work combined with the work of Thomas and Flavell and with Bandura’s own subsequent research (1982) clearly transitioned the dominant view of the learner from one of functioning simply as a reactor, responding to external stimuli, to a central figure in shaping the learning process. Furthermore, his work connected motivation with cognition by positing that it is only through cognition, or thought processes, that a possible future outcome
could motivate one’s present action and affect (Bandura, 1997). In other words, only when individuals use the cognitive process of thinking to envision the attainment of the achievement, affiliation or power they are seeking would they be motivated or compelled to take particular actions in the present.

In particular, Bandura was concerned with how cognitions, such as a person’s expectations of success or judgment of his capabilities, would affect their behavior. These expectations and judgments led to “people’s sense of personal efficacy to produce and to regulate events in their lives” (Bandura, 1982, p. 122), or simply, self-efficacy. While investigating phobic behaviors, he discovered that performance in a task varies according to a person’s perceived self-efficacy. That is, if two people had the same level of ability or skill, the person who believed herself to be competent and able to do a task would perform better than a person who judged her competence to be lacking. In addition, he found that self-efficacy is not a global construct or a trait but is task-specific. For this reason, self-efficacy must be studied in relationship to a particular task (e.g., riding a bike, taking a course, making a speech) and cannot be studied as an enduring personality trait. Moreover, self-efficacy can be influenced—caused to decrease or increase—by four main conditions: enactive attainments, vicarious experiences, verbal persuasion, and physiological states. To explain these conditions and their effects in an academic setting, a hypothetical student named Karen will be described.
Karen has set about the task of writing a paper. Enactive attainments that might help develop her sense of self-efficacy could be past papers she has written resulting in good grades and positive feedback. Her perception of her ability to write the current paper would be influenced by past achievements in that task. If these past achievement were positive, her self-efficacy would be higher than if these past experiences were negative or failure experiences.

A vicarious experience for Karen in her paper-writing task might occur through having a friend who had previously taken the course and successfully written the paper. She may have observed her friend’s visits to the library to find sources, or setting aside time for writing. Or she may have been asked to proofread a copy of the paper. Experiencing the process of writing the paper through observing a model successfully completing the task would result in higher levels of self-efficacy for Karen. If, however, she observed negative outcomes or failure in the task on the part of the other person, her self-efficacy for the task might have decreased.

Verbal persuasion could also increase Karen’s sense of self-efficacy. If she took her paper to the campus writing center and the tutor indicated that the writing process and strategies Karen was using were appropriate and effective, that she was an able writer, and that she would likely succeed in the task, self-efficacy would increase. Conversely, if the tutor criticized her writing ability without providing helpful feedback, her self-efficacy might decrease.
And, finally, Karen’s physiological state could influence her perception of her self-efficacy. If Karen experiences writer’s block when writing papers, the writing assignment might create anxiety. This anxiety might lower her self-efficacy for writing papers.

While each of these four conditions can affect a person’s self-efficacy, not only in academia but also in a multitude of other settings (Eccles & Wigfield, 2002), each condition does not have the same degree of influence or ability to impact self-efficacy for the task at hand (Bandura, 1982). The conditions have been described above in order of influence, with enactive attainments having the strongest influence on perceived self-efficacy, followed by vicarious experience, verbal persuasion, and physiological states.

Moreover, it is important to remember that self-efficacy refers to a person’s judgments, beliefs, or perceptions about their ability; it is not a measure of the person’s actual ability. But while this is true, Bandura (1982) found that perceived self-efficacy is so closely linked to performance that when self-efficacy is lacking, capable people may behave in ineffective ways and perform poorly. Furthermore, self-efficacy has strong effects on an individual’s choice of activities, the goals they set, their willingness to expend effort and their persistence on a task (Bandura, 1977; Eccles & Wigfield, 2002). The link between self-efficacy and persistence was found to be so strong that Jacobs, Prentice-Dunn and Rogers (1984) advocated a focus on intentionally enhancing student’s
self-efficacy for challenging tasks “to provide the cognitive stamina needed to persist in the face of difficulty” (p. 343).

*Attribution Theory*

A person’s sense of self-efficacy, then, is both a belief shaped by various experiences and environmental cues and also a shaper of future behaviors and beliefs. Another belief that strongly influences student motivation for learning concerns the cause of an outcome, either positive or negative. These beliefs are called attributions because they involve attributing an outcome to a certain cause or reason. Attributions were studied extensively by Weiner (1979, 1985).

Weiner’s early work concerned the explanations given by individuals for their success or failure in an achievement setting and how these explanations affect subsequent performance. Explanations given fell into four categories: ability, effort, task difficulty, and luck. In the context of academia, an example of attributing success or failure to ability would be a student who explained her “A” paper as resulting from a natural writing ability and innate intelligence. This student believes her ability leads to success and achievement. An example of an attribution to effort would be the student who explained failing a test as the result of lack of time spent studying. For this student, a lack of effort led to low achievement. An attribution to task difficulty would be typified by a student’s comments explaining his high score on an exam by stating that it was easy. This student believes that a low level of task difficulty led to his success. Finally, an
attribution to luck would take the form of a student explaining her marks on a presentation by remarking on how fortunate it was that the instructor was having a good day. For this student, the success results from a chance event outside her control. Each of these explanations, or attributions, can be applied to a situation of success or failure. That is to say, a person could perceive luck to be the cause of either a negative outcome or a positive one; or the amount of effort expended could explain either a success or a failure.

According to Alderman (2008), use of learning strategies was later identified and added as a fifth possible attribution. However, it could be argued that use of learning strategies is a subcategory of effort. Use of learning strategies requires thoughtful and directed action and expenditure of mental, if not physical, energy on the part of the learner (Clifford, 1986). Attributing success or failure to the use of learning strategies would take the form of a student explaining his or her excellent course grade by stating that she kept her course notes organized, continually looked for real-world examples of concepts encountered in the course, asked questions of the teacher, and had a devoted time and space to studying for that course. In this example, the student believes that success followed the use of the learning strategies of organization, elaboration, help-seeking and management of resources.

Attributions, or perceived causes of success or failure, can be categorized according to a causal structure which Weiner adopted and advanced but credited to Heider (1958), an Austrian-born psychologist who did early work in
attribution theory. This causal structure includes three dimensions: locus of control, stability, and controllability. An application of these concepts to a hypothetical college student named Tom and his failed calculus test follows.

The first dimension of an attribution, locus of control, refers to where Tom locates the cause of his actions. If the cause is perceived to be within himself, he is said to have an internal locus of control. If it is from factors in the environment and outside himself, he is said to have an external locus of control. If Tom had an external locus of control, he might say he failed the test because his roommate was playing music too loudly for him to study the night before. Conversely, if Tom had an internal locus of control, he would accept responsibility for the failed test and may blame himself for not finding a quiet place to study or seeking a tutor to help him prepare.

The stability dimension of an attribution is a person’s perception of a cause as either consistent or variable over time. For Tom, a stable cause would be one he perceives to be unchanging, such as lacking a propensity for logical thinking consistently leading to failure in math-related courses. On the other hand, an unstable cause would be getting sick and, therefore, being unable to study for the failed test, a situation that would have had a different outcome in changed circumstances or at a different time.

Finally, the controllability dimension of an attribution describes whether a person perceives the cause to be within or beyond his ability to influence through his decisions and actions. An uncontrollable cause for Tom’s failed test
could also be getting sick the week before or not being good in math.

Controllable causes in Tom’s case could be failure to put the necessary time into studying or not leaving the room when the roommate’s music proved a distraction.

As may be evident in these examples, these dimensions interact with one another. A perceived cause such as illness can be both unstable and uncontrollable. Or, a cause could be internal and stable such as Tom experiencing debilitating test anxiety every time he takes a test. All four of the common reasons for success or failure identified by Weiner—ability, effort, task difficulty, and luck—could be classified according to these dimensions. Ability is most often seen as an internal, stable, uncontrollable trait while effort is usually perceived as controllable and unstable, varying according to the situation. Task difficulty is usually seen as external and uncontrollable but can be perceived as stable if a particular professor’s tests are thought to be consistently impossible, or unstable if Tom believed that working with a tutor will help him pass the test while not doing so would not (Alderman, 2008). Luck, while usually seen as uncontrollable, may be seen as unstable if Tom thought that he was lucky on some days and tests but not on others. Or luck could be perceived as stable if Tom thought of himself as an endurably unlucky person.

What is important to remember here is Weiner’s (1985) caution that “perceived causality certainly will differ from person to person and within an individual over occasions. This is true not only for a specific causal inference,
but also for the meaning or dimensional location of the cause (p. 555).” In other words, the reasons students give for their success or failure and the meaning this explanation has for the student will differ between students and within the same student depending on the context. Therefore, much care should be taken in interpreting students’ attributions as there are many variables to consider. In fact, it is this very variability that caused Weiner (1992) and others (Jesse & Gregory, 1986) to propose and research ways to influence the attributions students make in order to re-train them to make attributions that would help rather than hinder their success.

*Expectancy-Value Theories*

Weiner’s attribution theory is sometimes included in a category of motivation theories known as expectancy-value theories. These theories have two main assumptions: 1) that behavior is undertaken because the person expects to reach or fulfill a particular goal, and 2) that the goal the person is striving for is perceived to be valuable by that person (Weiner, 1992). Attributions serve as a potential explanation for goal-directed behavior in that individuals will pursue those positive outcomes that they value and can expect to attain. As such, attributions are “key motivational beliefs” (Eccles & Wigfield, 2002, p.117). Further research based on Weiner’s attribution model (Forsyth & McMillan, 1981; Porac, 1981; DeBoer, 1984) found it to be valid. Attributions were clearly linked to academic achievement and learning through their
influence on students’ affect and behavior (Wittrock, 1986). Moreover, a student’s locus of control and the perceived controllability of aspects of their college experience were found to have an impact on student persistence and retention (Frankel, 1985).

Expectancy-value models build on Atkinson’s (1964) model of achievement motivation. Expectancy-value theories conceptualize behavior as stemming from a combination of expectations about reaching a particular outcome and the value the person places in achieving that outcome (Schunk, 1991). Expectancy can be one of two types. Individuals can form an outcome expectancy, which connects a particular outcome with a particular action, or an efficacy expectancy, which connects a particular outcome with the person’s own ability to realize that outcome (Eccles & Wigfield, 2002). Value can be one of three types: attainment value, intrinsic value, or utility value.

Attainment value refers to the task’s ability to provide the student with a challenge, an achievement, or a view of self that the student needs or wants. For example, a student who perceives himself as smart may want confirmation of that view through attaining positive public feedback from the instructor on an oral presentation. Attainment value is thought to result in higher levels of engagement in the task (McKeachie et al., 1986).

Intrinsic value, however, relates to a students’ interest in the task not for its outcome but for its own sake. For instance, a student who enjoys physical activity may value the assignment of logging hours in the weight room or
swimming pool simply because it fits with her own preferences for what she would choose to do with her time. This kind of value not only affects a student’s involvement in the task but his/her achievement as well (McKeachie et al., 1986).

Utility value, like attainment value, stems from the outcome of the task and what it might mean to the student. But while the outcome itself is valued in attainment value, in utility value the outcome is only a means to reaching a valued goal at a later time. The more important the task is to achieving the future goal, the more utility value it will have for the student. Practicing scales and learning music theory may not have intrinsic value or attainment value for many students. But for a student with the goal of becoming a concert pianist or music teacher, these activities would have utility value. Like intrinsic value, utility value shapes students’ levels of involvement in a course and, most likely their choice of courses as well (McKeachie et al., 1986).

**A Learning to Learn Course**

In the early 1980s, at about the same time that these discoveries about attribution theory were being made, McKeachie began to collaborate with Pintrich, another scholar interested in motivation for learning. Pintrich had begun to apply Weiner’s theory to student perceptions of ability among elementary school children (Blumenfeld, Pintrich, Meece, & Wessels, 1982). The two received a grant from the National Science Foundation to create a “Learning to Learn” course at the University of Michigan (Duncan & McKeachie, 2005).
The purpose of the course was to help college students become lifelong learners by developing their motivation and skill for continued learning. Their approach to the course was defined by the work of Paris, Lipson, and Wixson (1983) who distinguished three kinds of knowledge, all of which McKeachie and Pintrich sought to impart through their course: declarative, procedural, and conditional.

In the context of the Learning to Learn course, declarative knowledge meant knowing what learning strategies were available, procedural knowledge meant knowing how to use the strategies, and conditional knowledge meant knowing when and why to use particular strategies. In including conditional knowledge as a goal for their course, McKeachie and Pintrich differentiated the course from other existing study skills programs. They wanted students to comprehend the psychological theories and processes underlying the strategies so they would understand why the strategies worked rather than merely how to use them (McKeachie, Pintrich, & Lin, 1984). They not only applied theory but also taught the theoretical framework that supported their work.

Another goal the team had in creating the course was to address concern about students coming to college without the necessary skills to succeed. Two populations were of particular concern. These were minority students, among whom the retention rate was lower than that of the general student population, and athletes, who seemed to lack academic confidence and skill. Additionally, McKeachie was particularly concerned about the effects of test anxiety on students. He believed this anxiety stemmed from students’ narrow collection of
study strategies—limited to rote memorization and repetition—and missing more effective strategies (McKeachie, Pintrich, & Lin, 1984).

Outcomes of the Learning to Learn course were assessed using items from the Learning and Study Strategies Inventory (LASSI; Weinstein, Schulte, & Palmer, 1987) and five newly-developed test anxiety items in addition to measures of attribution and expectancy for success. The grade point averages of students in courses they took following the Learning to Learn course were also collected from the 80-100 students taking this course each of the six semesters it was taught. When this data was analyzed, the results showed significant changes in students’ use of learning strategies, small but insignificant changes in grade point average, and significant interactions between measures of student attribution and test anxiety.

This course was an example of further philosophical changes taking place in the study of student learning and motivation in the mid-1980s. The learner became the center of most research related to motivation, as a societal shift toward greater personal responsibility was reflected in many models and theories. For example, constructivism, with its emphasis on the learner’s role in creating knowledge and shaping a worldview, became prevalent in education and guided studies of the nature and certainty of knowledge, or epistemology (Fosnot, 1996). In the field of motivation, Deci and Ryan (1985), proposed self-determination theory. According to this theory, individuals have needs for competence and an ability to act upon the world and cause particular outcomes.
These needs motivate them to act in particular ways. Moreover, the theory posits that individuals go through a process of internalizing their motivation as their reasons for acting stem more and more from their thoughts, beliefs, and desires rather than from external forces such as the wishes of other people, course grades, or incentives offered (Deci, Vallerand, Pelletier, & Ryan, 1991).

**Achievement Goal Theory**

Accompanying this change in the view of the learner was another shift that refocused the study of motivation. Motives, which had primarily been viewed as drives until this time, came to be viewed instead as goals (Covington, 2000; Pintrich 2000a). Because early theorists such as Woodworth (1918), Thorndike (1911) and Hull (1943) viewed the human person as a machine, it followed that motivation had been seen until that time as a drive, the result of bodily processes acting on the person. This view left little room in their theories for unobservable mental processes that would lead to purposeful action in pursuit of a meaningful goal (Weiner, 1992).

Unobservable mental processes were key in the work of Atkinson (1957) and McClelland (1955) who had proposed two opposing motivational dispositions, hope for success and fear of failure, which served to motivate people. They assumed that people could and would connect their actions with their view of the possible outcomes and that they had decision-making ability about their behavior. This change in the view of the person led to a
transformation in the approach taken to motivation. So it was that, during the 1980s, the dominant view of motives as drives impelling people to action gradually gave way to an approach to motives as goals that enticed people to action (Covington, 2000).

Goal theorists such as Ames (1992), Dweck (1986), and Nicholls (1984) claimed that goals give meaning and purpose to an individual’s actions and, in doing so, motivate that individual’s behavior to fulfill that meaning and reach that purpose. These goals were dichotomized into performance goals or mastery goals.

Mastery goals (also called learning goals) refer to “increasing one’s competency, understanding, and appreciation for what is being learned” (Eccles & Wigfield, 2002, p. 174). Students who adopt these kinds of goals tend to seek challenge, to persist when obstacles arise, and to enjoy the process of mastering a task. They will choose challenges because of the potential for increasing their knowledge and skill even when they risk failure in doing so. Obstacles, for students with mastery goals, point to a need either for additional effort or use of new or additional strategies in reaching the goal. An obstacle, then, often results in improved performance on the part of that student (Dweck, 1986; Hagen & Weinstein, 1995).

On the other hand, performance goals (also called task goals, self-enhancing goals, or ego-goals) “involve outperforming others as a means to aggrandize one’s ability status at the expense of peers” (Eccles & Wigfield, 2002,
Students who pursue these types of goals tend to choose tasks based on how their success or failure will reflect their levels of ability. Because they are motivated to outperform others and want to avoid being seen as lacking in ability, they may avoid challenging tasks in which a positive outcome is seen as unlikely in favor of easier tasks on which they are more confident they will succeed. Or, they may choose exceedingly difficult tasks in which failure would not reflect poorly on their ability. In general, however, in the minds of students with performance goals, failure is equated with low ability. Consequently, these students will commonly use defensive strategies to avoid being perceived as lacking ability. One of these strategies is called learned helplessness, in which the student will avoid taking on a challenging task or respond to a challenging task by decreasing effort and strategy use so that should the student fail, the failure can be portrayed as stemming from a lack of effort rather than a lack of ability (Dweck & Leggett, 1988; Elliott & Dweck, 1988). So, while challenging tasks for students with learning goals improved performance, for students with performance goals, challenging tasks often decreased their level of performance. In addition, performance goals have been found to work against the development of intrinsic interest in the task because the individual is not doing the task for its own sake but as a means to an end (Dweck, 1986; Hagen & Weinstein, 1995).
Components of Motivation Model

This new knowledge, which came to be known as achievement goal theory, was applied to various classroom contexts and became an important foundation in the work on college student motivation being done by McKeachie and Pintrich. In 1986, they had been tapped to head Program B of the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL), a newly-established initiative at the University of Michigan funded by a five-year grant (Pintrich, Smith, Garcia & McKeachie, 1993; Duncan & McKeachie, 2005). Along with Lin, Smith and Garcia, McKeachie and Pintrich began to focus their research on what college students brought to the learning task: their motivations, their cognitions and their beliefs (McKeachie, Pintrich, Lin, & Smith, 1986). Upon reviewing the current literature on motivation for learning, they created a model defining the components of student motivation (see Figure 3) and their relationship to one another.

The model was based on several important prior assumptions about teaching and learning (McKeachie, et al., 1986). First, the model is a student-mediated model. This means that student’s motivations and cognitions are central in understanding how learning and achievement take place and less emphasis is given to teacher behaviors or instruction methods in their effect on student outcomes. This is especially relevant at the college level where much of student’s learning and studying takes place outside the classroom. Furthermore,
variations in a student’s motivations and cognitions will vary all other aspects of the model.

Second, the model is a social-cognitive model rather than a developmental or personality model. For this reason, motivational constructs such as attribution patterns or self-efficacy are not seen as inalterable personal qualities or traits present at birth and emerging as the person matures. Instead, these constructs are the result of a person’s thoughts and beliefs, which are influenced by factors.

Figure 3: Components of Motivation Model
From Teaching and Learning in the College Classroom: A Review of the Research Literature (p. 44), by W.J. McKeachie, P.R. Pintrich, Y. Lin, & D. Smith, 1986, Ann Arbor, MI, University of Michigan National Center for Research to Improve Postsecondary Teaching and Learning. Copyright 1986 by the National Center for Research to Improve Postsecondary Teaching and Learning. Reprinted with permission.
in the environment and give rise to motivated behavior. In fact, these three entities—person, behavior and environment—are said to be in a relationship of triadic reciprocity (Schunk, Pintrich, & Meece, 2008), each one affecting the others. This translates into an emphasis on the student as an active processor of information whose perceptions not only matter but also play a key role in a students’ potential achievement (McKeachie et al., 1986).

Third, the model assumes that the more engaged a student is the more that student will learn. This engagement happens through self-regulated learning. Self-regulated learning refers to students’ attempts to control various aspects of their own learning process in order to achieve their goals (Zimmerman, 1990; Pintrich, 1995). It includes planning, monitoring, and adjusting their motivations, cognitions, behaviors and contexts. McKeachie et al. (1986) both connect this concept to and distinguish it from Astin’s concept of student involvement discussed in an earlier section:

*Student involvement in self-regulated learning* is similar to Astin’s (1985) construct, although we take a more cognitive approach to student involvement than Astin’s behavioral approach. Our construct of student involvement concerns the students’ cognitive engagement and commitment to the task at hand. We assume that the more a student is meaningfully engaged in the task, the more she or he will learn. Our conceptualization of student involvement in self-regulated learning assumes that the student is an active learner. Self-regulated learning is a combination of cognitive and metacognitive involvement with a task as well as motivated involvement with a task. (p.3)

Fourth, their model would fall into the family of motivation theories known as expectancy-value theory. To a greater extent than other expectancy-
value models, however, McKeachie, Pintrich, Lin and Smith’s model (1986) has a distinct emphasis on the cognitive aspects of motivation. It focuses on how students’ thoughts and beliefs impact their desire or will and behavior to achieve particular goals. It assumes that motivation and cognition are interconnected processes rather than happening apart from one another.

A fifth assumption is that cognition is assumed to include students’ learning strategies, their content knowledge, and their problem-solving and thinking skills. This is closely related to a sixth assumption, which is that instructional activities and methods do have an effect on both student motivation and cognition (McKeachie et al., 1986).

And finally, the model assumes that students are not blank slates upon arrival on college campuses. Therefore, student entry characteristics are important because of the ways that students’ prior experiences have shaped their motivation and cognition (McKeachie et al., 1986).

The desired outcome and endpoint of the model is student achievement (see Figure 3). Achievement in this model would be characterized by students’ degree of self-regulated learning, their choice of and persistence in a learning task, and their academic performance as measured by grades and grade point averages. Student achievement would result from a student’s expectancy for success at the task under consideration and the value the student gave to the task.
Students’ expectancy for success flows from a complex interaction of a variety of factors. These include the students’ beliefs concerning their self-efficacy, control, and the potential outcome. These beliefs, in turn, are affected by students’ perceptions of the difficulty of the task and their own competence in the task. Closely related to their perception of task difficulty and their competence are the student’s affect, or emotions, and level of text anxiety. Together these factors form what McKeachie et al. (1986) call the Expectancy for Success path. The other path in the model, the Task-Value path, is envisioned as a simpler flow of student’s goals and goal orientation causing them to value certain tasks. These values, in turn, affect their achievement.

A Taxonomy of Learning Strategies

Because of their assumption about the relationship of cognition to motivation and their commitment to the idea that students can be taught how to learn, it is not surprising that, in addition to their Components of Motivation model, McKeachie and the team at the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTEL) developed a Taxonomy of Learning Strategies (see Table 1).

The taxonomy focused on macrolevel learning processes that were under the control of the student and could be measured via self-report. The taxonomy extends previous work by Weinstein and Mayer (1986) and has three basic
<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Taxonomy of Learning Strategies</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1. Cognitive Strategies</td>
</tr>
<tr>
<td>A. Rehearsal Strategies</td>
</tr>
<tr>
<td>Reciting list</td>
</tr>
<tr>
<td>Keywork method</td>
</tr>
<tr>
<td>Imagery</td>
</tr>
<tr>
<td>Method of loci</td>
</tr>
<tr>
<td>C. Organizational Strategies</td>
</tr>
<tr>
<td>Clustering</td>
</tr>
<tr>
<td>Mnemonics</td>
</tr>
<tr>
<td>2. Metacognitive Strategies</td>
</tr>
<tr>
<td>A. Planning Strategies</td>
</tr>
<tr>
<td>Skimming</td>
</tr>
<tr>
<td>Generating questions</td>
</tr>
<tr>
<td>B. Monitoring Strategies</td>
</tr>
<tr>
<td>Attention-focus</td>
</tr>
<tr>
<td>Test-taking strategies</td>
</tr>
<tr>
<td>C. Regulating Strategies</td>
</tr>
<tr>
<td>Re-reading</td>
</tr>
<tr>
<td>Reviewing</td>
</tr>
<tr>
<td>Test-taking strategies</td>
</tr>
<tr>
<td>3. Resource Management Strategies</td>
</tr>
<tr>
<td>A. Time Management</td>
</tr>
<tr>
<td>Goal setting</td>
</tr>
<tr>
<td>B. Study Environment Management</td>
</tr>
<tr>
<td>Quiet area</td>
</tr>
<tr>
<td>Organized area</td>
</tr>
<tr>
<td>C. Effort Management</td>
</tr>
<tr>
<td>Mood</td>
</tr>
<tr>
<td>Self-talk</td>
</tr>
<tr>
<td>Persistence</td>
</tr>
<tr>
<td>Self-reinforcement</td>
</tr>
<tr>
<td>D. Support of Others</td>
</tr>
<tr>
<td>Seeking help from peers</td>
</tr>
<tr>
<td>Peer/group learning</td>
</tr>
<tr>
<td>Tutoring</td>
</tr>
</tbody>
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categories: cognitive strategies, metacognitive strategies and resource management strategies.

The Cognitive strategies include rehearsal strategies, elaboration strategies, and organizational strategies; each group of strategies in this section is separated into basic tasks and complex tasks. A hypothetical student named Lisa will serve as an example in explaining these strategies. If Lisa were studying for a grammar exam she might use the strategy of rehearsal to learn a list of common prepositions. As rehearsal involves reciting or repeating information in a list to be learned, she might say the list over and over to herself or a study partner. This would be basic rehearsal. On a more complex level, Lisa could copy the list or underline all the prepositions in her notes. She also could use elaboration strategies. On a basic level, she might imagine a favorite object in all the locations specified by the prepositions: in a box, on a box, under a box, beside a box and so forth. At a more complex level, she might answer questions posed to her by a study partner about prepositions or identify words in sentences that were prepositions and explain how she knew. She could also use Organizational strategies to learn the prepositions. For basic organizing, she could pair the prepositions into opposites such as to and from, for and against, over and under, or she could create a song or jingle using all the words to serve as a memory device or mnemonic. On a more complex level, she would diagram sentences, using a particular symbol to indicate a prepositional phrase. All of these cognitive
learning strategies—rehearsal, elaboration, and organization—function to help
the student process information and code it in the memory (McKeachie et al.,
1986).

Metacognitive learning strategies include planning strategies, monitoring
strategies, and regulating strategies. Lisa might also use these strategies in
studying for her exam. If her grammar exam is on Friday, she might use
planning strategies by setting up a study group session for the Tuesday before
the exam so that any unresolved questions the group had about the material
could be asked of the instructor in Wednesday’s class. She could also plan for
the exam by using what she knew about the instructor’s previous tests and
quizzes to generate possible questions that might be on the exam. The use of
monitoring strategies might include testing herself with flashcards to see what
areas she knows well and what areas are lacking. During the exam itself, she
might monitor the time spent on each section of the test to make sure she
completes all the questions. Or, Lisa could use regulating strategies by
reviewing her class notes and spending extra time on concepts or procedures
that are more difficult.

The Resource Management strategies include time management, study
environment management, effort management, and support of others. For Lisa
to schedule two hours of study each weeknight before the Friday exam would be
an example of using time management as a learning strategy. If she spends the
scheduled two hours in the library where she is better able to concentrate, she
would be using the study environment management as a strategy. If she tells herself that week that her studying for past tests has paid off and rewards herself for each completed block of study by watching a favorite sitcom with friends, she would be using effort management. And finally, forming a study group, asking questions of the teacher, and finding a tutor for the especially difficult concepts would be examples of utilizing the support of others to learn and reach her goal of succeeding on the exam.

The Motivated Strategies for Learning Questionnaire (MSLQ)

The Components of Motivation Model and Learning Strategies Taxonomy reflected what McKeachie and Pintrich had learned through teaching their Learning to Learn course and administering various instruments to the hundreds of students who had taken the course. In addition, the model and taxonomy were based on a thorough review of motivation literature completed and published by the NCRIPtal team (McKeachie et al. 1986). Now, as this team sought to advance knowledge of effective teaching and learning at the college level, they needed an instrument able to measure the various constructs in the model and use of strategies in the taxonomy. The instrument McKeachie, Pinrich, Smith and Garcia, a graduate assistant that had joined the team, would develop over the next five years would come to be known as the Motivated Strategies for Learning Questionnaire (MSLQ; Pinrich, Smith, Garcia, & McKeachie, 1991).
Various instruments had been designed to assess the outcomes of their Learning to Learn course. These had been analyzed and revised between each administration. In their different forms the instruments had ranged in length from 50 to 140 items and were administered to over one thousand students. Now these instruments and the literature-based model and taxonomy the team had created formed a starting point for them when the formal development of the MSLQ began in 1986 (Duncan & McKeachie, 2005).

From 1986 to 1988, there were three major waves of data collection: 326 students in 1986, 687 students in 1987, and 758 students in 1988. The students in these samples represented a four-year comprehensive university, a small liberal arts college, and a community college. After each administration, the questionnaire items were analyzed for internal reliability and factor analyses were conducted to group the items into scales. Based on these analyses, items were rewritten, dropped, or added for the next wave of administration and analysis (Pintrich et al., 1993). The final version of the instrument, representing ten years of work and multiple data collections, contained fifteen scales, divided between two major sections (see Table 2).

The first section contained thirty-one items and measured motivational constructs from the Components of Motivation model in three groupings: values, expectancies, and affect related to learning. The second section contained 50 items that measured the use of strategies that make up the Taxonomy of Learning Strategies in two groupings: cognitive and metacognitive strategies and
resource management strategies (Duncan & McKeachie, 2005). It was significant that the MSLQ included measures of both cognitive and motivational constructs. In doing so it laid the groundwork for current research, particularly in the field of self-regulated learning that emphasizes both cognition and motivation and

Table 2

Structure of Motivated Strategies for Learning Questionnaire (MSLQ)

<table>
<thead>
<tr>
<th>Listing of Motivation Scales</th>
<th>1. Value Components</th>
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<tbody>
<tr>
<td></td>
<td>a. Intrinsic Goal Orientation</td>
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<tr>
<td></td>
<td>b. Extrinsic Goal Orientation</td>
</tr>
<tr>
<td></td>
<td>c. Task Value</td>
</tr>
<tr>
<td>2. Expectancy Components</td>
<td>a. Control Beliefs about Learning</td>
</tr>
<tr>
<td></td>
<td>b. Self-Efficacy for Learning &amp; Performance</td>
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<tr>
<td>3. Affective Components</td>
<td>a. Test Anxiety</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Listing of Learning Strategies Scales</th>
<th>1. Cognitive and Metacognitive Strategies</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>a. Rehearsal</td>
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<td></td>
<td>b. Elaboration</td>
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<td></td>
<td>c. Organization</td>
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<td></td>
<td>d. Critical Thinking</td>
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<td></td>
<td>e. Metacognitive Self-Regulation</td>
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<tr>
<td>2. Resource Management Strategies</td>
<td>a. Time and Study Environment</td>
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<td></td>
<td>b. Effort Regulation</td>
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<td></td>
<td>c. Peer Learning</td>
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<td></td>
<td>d. Help-Seeking</td>
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seeks to understand how they interact (Zimmerman, 1990; Garcia & Pintrich, 1995; Zimmerman, 2000). Moreover, the development of the MSLQ enabled further research on all the constructs and learning strategies defined in its fifteen scales. The remainder of this chapter will review the literature related to these constructs and learning strategies.

**Research on Motivational Constructs**

The MSLQ measures six motivational constructs: Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Control Beliefs about Learning, Self-Efficacy for Learning and Performance, and Test Anxiety. These constructs and their links to student learning and achievement will be discussed in the following sections.

**Intrinsic Goal Orientation and Extrinsic Goal Orientation**

Intrinsic Goal Orientation and Extrinsic Goal Orientation, two motivational constructs measured by the MSLQ, will be discussed together as they are most often studied together. Intrinsic Goal Orientation and Extrinsic Goal Orientation are often understood in contrast to one another and reflect much of the work done on achievement goal theory. Goal orientation, in general, can be defined simply as a student’s perceived reasons for engaging in a learning task. A student’s goal orientation answers the question “*why am I participating in this learning task?*” An intrinsic goal orientation answers the
question by referencing the task itself. Illustratively, items on the MSLQ measuring intrinsic goal orientation ask students to rate their desire to take a course for the sake of challenge, learn new things, assuage curiosity, and understand thoroughly. For someone with a strong intrinsic goal orientation, learning is an end in itself (Pintrich et al., 1991). Intrinsic goal orientation, then, mirrors the concept of mastery goals in achievement goal theory. Cronbach’s alpha (coefficient alpha), a measure of reliability, for this MSLQ scale is .74. (Pintrich et al., 1991).

In contrast, extrinsic goal orientation can be likened to the concept of performance goals in achievement goal theory. Reasons for participating in a learning task given by a student with an extrinsic goal orientation would likely be high grades, rewards, the opportunity to perform well and be highly evaluated by others, and competition. For such a student, participating in the learning task is a means to an end other than the learning itself. MSLQ items measuring this scale in reference to a course refer to showing one’s ability to family, friends, or employers, improving a grade point average, and outperforming others in the class. The coefficient alpha for this MSLQ scale is .62.

But while intrinsic and extrinsic goal orientation are often seen as opposites, further research into mastery and performance goals showed that these goal orientations are not necessarily mutually exclusive. Instead, it is possible for students to have multiple goals for the same task (Wolters, 2004; Grant & Dweck, 2003, Pintrich 2000b). For instance, a student may be very
interested in a subject and desire to learn for learning’s sake and, at the same
time, desire to learn about that topic to get an excellent grade on a paper. Lin,
McKeachie, and Kim (2003) suggest that intrinsic goal orientation (mastery goals)
and extrinsic goal orientation (performance goals) ought not to be seen as
dichotomous but rather as “separate continua” (p. 252).

Furthermore, performance goals were found to be of two different types:
performance-approach goals and performance-avoidance goals (Harackiewicz,
Barron, Pintrich, Elliot, & Thrash, 2002). Approach goals are positive in nature,
reflecting the learner’s desire to attain a particular outcome. Avoidance goals are
negative, reflecting the learner’s desire to evade the consequences of NOT
achieving the desired outcome. In an academic setting, a performance-approach
goal might be to give an excellent speech in communications class so as to get a
good grade and be positively evaluated by others. A performance-avoidance
goal would be to give an excellent speech so as to avoid failing or looking foolish
to the instructor and peers in the class. Grant and Dweck (2003) distinguish
among three different kinds of performance-approach goals. The first of these is
a performance goal that if achieved would confirm a person’s view of himself.
That is, if Matt sees himself as a highly intelligent honors student, he may work
hard on a scholarship application essay in order to receive a scholarship. This
would validate this view of his ability and identity. The second type of
performance approach goal is normative, or one in which an individual
compares himself to others. For example, Matt may want to be the chosen
scholarship recipient in order to see his name announced in the school paper, thus being evaluated more favorably than the other applicants. Thirdly, a performance-approach goal can take the form of simply wanting to achieve the positive outcome related to doing well on a task. In Matt’s case, this might mean he wants to receive the scholarship simply because this would be a good reward for his efforts and could help him get into his first-choice of graduate schools.

Mastery goals have also been sub-divided into approach and avoidance categories (Pintrich, 2000a). A mastery-approach goal would be a goal in which the focus is on learning and understanding and the standards used to evaluate this learning would be self-defined, often in terms of making progress, improving or achieving a deep understanding of a topic. For example, Mary may have a keen interest in understanding how the human body works and she may investigate topics in her study for biology class that are unrelated to getting a good grade on an exam. She is interested in advancing her knowledge. A mastery-avoidance goal, on the other hand, is one in which the student wants to avoid not learning or understanding. Such goals are often characteristic of perfectionists and the evaluative standard here would be “not getting it wrong” (Pintrich, 2000a, p. 100). If Mary adopted a mastery-avoidance goal, she might spend additional time studying for her biology class in an effort to ensure that she has a complete understanding of the topic and won’t miss any important aspects that could result in only a partial understanding.
While the motivated behavior—Matt working hard on his scholarship application essay or Mary spending additional time studying for her biology class—may be the same, the reasons for the behavior are different in the various approach or avoidance states. This difference, in turn, affects various outcomes associated with motivation. Adopting a performance-approach goal to validate one’s ability was found to predict negative affect and cognition and poorer performance in future tasks (Grant & Dweck, 2003). So, returning to Matt’s case, if he did not receive the scholarship, he would likely have a lower assessment of his ability and not do as well on future scholarship application essays.

In addition, when students adopt any type of performance goals, they are less likely to use deeper cognitive processing strategies in their learning. On the other hand, when students adopt mastery goals, they have been found to have higher intrinsic motivation and self-efficacy, use more metacognitive self-regulated learning strategies, and exhibit a higher level of performance on the task, especially when encountering obstacles or challenges (Grant & Dweck, 2003; Wolters, 2004; Hsieh, Sullivan, and Guerra, 2007). Further, students with high intrinsic motivation were also found to be low in test anxiety, high in self-efficacy, and more likely to use study strategies such as elaboration and organization (Ford, Weissbein, Smith, & Gully, 1998; Lin, McKeachie, & Kim, 2003).

Because intrinsic motivation and mastery goals have been so often associated with more positive learning outcomes for students, extrinsic
motivation and performance goals are usually seen as maladaptive. But this is not always the case. In fact, Pintrich (2000b) found little difference between a group of students with both a high mastery orientation and a high performance orientation when compared to a group of students with a high mastery orientation and a low performance orientation. Similarly, Lin, McKeachie and Kim (2003), studying four groups of college students (three in the United States and one in Korea), found that high grades were obtained by intrinsically motivated students but the best grades were obtained by students with a high level of intrinsic motivation coupled with a moderate level of extrinsic motivation. For these reasons, Pintrich (2000a) suggests that it is unhelpful to think of students as either motivated or unmotivated and more helpful to focus on how students are motivated. Understanding whether students hold mastery or performance goals and whether those goals are oriented toward approach or avoidance may seem to be a fine distinction. However, according to Harackiewicz et al. (2000), “each of these goal orientations fosters distinct patterns of cognition, affect and behavior” (p. 317). And it is in understanding these patterns that the theories translate into useful practice for promoting student success and performance and thereby, student learning and retention.

Moreover, Pintrich (2000a) emphasizes the importance of viewing goals as contextual and dynamic constructs that change over time and in relationship to different tasks and situations. Therefore, measuring them in relation to particular contexts and developmental stages is essential for a true
understanding. Because the MSLQ is course-specific, it is able to do this. It is also able to measure the interrelatedness of Intrinsic and Extrinsic Goal Orientation with other constructs.

Task Value

The Intrinsic Goal Orientation scale, for example, is strongly related (with a correlation coefficient, \( r \), of .68) to the third of the value components scales: Task Value. Unlike Goal Orientation, which addresses why a student is doing a task, Task Value answers the question “what do I think of this task?” (Pintrich et al., 1991). The items on the Task Value scale measure the constructs of attainment value, intrinsic value, and utility value discussed earlier in this chapter and included in the Components of Motivation Model developed by McKeachie and his colleagues. Attainment value is explored through items addressing how important the task is to the respondent. Intrinsic value is assessed through items relating to how much the respondent likes and is interested in the course content. And, utility value is addressed through items concerning how useful the course content is perceived to be currently and in relation to future coursework. The coefficient alpha for the Task Value scale of the MSLQ is particularly strong at .90 (Pintrich et al., 1991).

Cost value, a fourth category of value not included in the model or MSLQ, was posited by Eccles (1987). Cost value reflects the reality that choosing one task over another results in the necessity to delay or lose the opportunity to
choose another task. Additionally, in an academic setting, when a student chooses a particular course there are costs associated with that choice. Such costs include the perceived time and effort a student must commit to that course and the emotional states, such as performance anxiety or fear of failure, that the student risks experiencing (Schunk, Pintrich, & Meece, 2008).

Cost value, attainment value, intrinsic value, and utility value combine to define the perceived significance that a particular task has for an individual. In general, the value a student places on a particular task is more predictive of which choice of tasks or courses that student will make than it is of either the student’s success or achievement in that course and the student’s expectancy beliefs about their likelihood of reaching the valued outcomes (Schunk, Pintrich, & Meece, 2008). Choice, however, can be a significant predictor of motivation, persistence, performance and production (Patall, Cooper & Robinson, 2008), so it could be said that, through its impact on the choices students make, task value indirectly rather than directly affects student success and achievement.

The value placed on a task may also vary according to a student’s time orientation. A study by Husman, Derryberry, Crowson, and Lomax (2004) found that different responses were given to inquiries about task value when the items referred to a task’s utility value in the present versus the future. That is, while a student may perceive a task to be valuable in achieving future goals, that student may not find the task to be useful at the present time. Value in terms of these different time orientations is not distinguished on the MSLQ’s Task Value scale.
In addition, these researchers found intrinsic motivation to be significantly related to task value, but the constructs to be unique. Intrinsic motivation and future-oriented utility value (also called instrumentality) were related to more time spent studying. This is another indication that while task value may not directly influence college student learning it may do so indirectly, in this case by increasing a student’s intrinsic motivation or by motivating them to spend more time studying (Husman et al., 2004).

Intrinsic value, also called interest, is often studied for its impact on learning and achievement. A particularly intriguing study was conducted by Sansone, Weir, Harpster, and Morgan (1992) in which they found that subjects used various mechanisms to stimulate their own interest in a given task. The more they did so, the more likely they were to continue the task and report more positive feelings about it. For example, individuals asked to copy letters onto a piece of paper would use the task as an opportunity to develop artistic skills or make it into a game. Wolters (1998) also found that students would use strategies such as connecting a task with other, more valued, tasks or goals in order to increase an assignment’s task value and their subsequent motivation to complete it. It is possible, therefore, for interest, or intrinsic task value to be strategically increased. Hagen and Weinstein (1995) suggest that this can be done not only by students using interest-regulating strategies but also by instructors. They advocate that instructors motivate their students by providing
challenging classroom tasks. Challenge increases interest and stimulates student engagement in a task, thereby increasing students’ motivation.


Control Beliefs about Learning

The fourth scale of the MSLQ, called Control Beliefs about Learning, measures students’ beliefs about their own ability to control the outcome of their efforts at learning. This scale seeks to measure the concepts posited by attribution theorists. Attribution theory maintains that when students believe that positive outcomes are linked to effort, rather than luck, ability or task difficulty, they will be more likely to expend effort to use study strategies and thus perform better on academic tasks. Conversely, if students believe that their effort will make little difference to the outcome, they will not be motivated to use study strategies. Four MSLQ items measure Control of Learning Beliefs and refer to whether a student is trying hard, studying in appropriate ways, and holding oneself responsible should the course material not be learned. The coefficient alpha for this scale is .68 (Pintrich et al., 1991).

Holschuh, Nist, and Olejnik (2001) conducted research on college students’ beliefs about the causes of failure in a course. They found that a student’s belief that failure is caused by ineffective use of study strategies is
linked to several important beliefs about that student’s likelihood of future success. Attribution to strategy use was more strongly linked to the belief that the student will try again and succeed in the future, will change study behaviors, and can expect success, than was attribution to ability.

This study also researched the effect of attribution on various emotions, finding that attribution to effort resulted in the most negative emotional responses. In particular, they found sadness about the failure outcome most strongly linked to attribution to effort, suggesting students would feel the most sadness when they thought the failure was due to not trying hard enough. Shame was related to all attributions—effort, strategy use, or ability—for men but related most strongly to effort for women. In other words, women responded saying they would feel more shame when course failure resulted from not trying hard rather than from not having the ability or using effective strategies while men thought shame would result no matter the cause of the failure. Guilt was linked more strongly to attribution to effort and least strongly to incorrect strategy use. The respondents associated anger with attribution to effort more strongly than to strategy use.

In summary, this study found the strongest negative emotional responses resulted from attribution to effort while the most positive outlook for future success was linked to attribution to strategy use. This means that although students may believe that changes in strategy use will lead to better outcomes, they may be unlikely to change their strategy use because they do not have as
negative an emotional response to failure when they believe it results from incorrect strategy use. Said differently, it is not as bad an experience affectively to fail when not using strategies for these students, so they have less motivation to learn and use the strategies even when they believe they will do better when using them. This “may explain why many students do not change their studying habits despite the fact that the strategies they are using result in continued failure” (Holschuh, Nist, & Olejnik, 2001, p. 170).

Pintrich (2004) writes that this link between affect and regulation of strategy use warrants additional research. Because effort and strategy use are controllable and ability and luck are not, the fact that students in Holschuh, Nist, and Olejnik’s study (2001) most often linked failure with causes within a student’s control offers hope for supporting enhanced student achievement. If students’ believed success was beyond their control, they would not be motivated to expend effort and use strategies known to improve achievement. Furthermore, interventions can and have been designed and offered to teach students to use effective learning strategies.

*Self-Efficacy for Learning and Performance*

The other expectancy component of motivation measured by the MSLQ is Self-Efficacy for Learning and Performance. The coefficient alpha on this scale is the highest of the fifteen at .93, meaning the seven items making up this scale are particularly effective at measuring this construct. Two very similar aspects of
expectancy are measured in this scale. First, the scale measures expectancy for success, or the degree to which the student anticipates doing well in the course. Second, the items on this scale measure self-efficacy. Differentiating these two concepts reflects Bandura’s (1982; 1989) work on self-efficacy. He distinguishes between judgments that a behavior is likely to lead to a particular outcome and judgments of personal competence. These two similar but distinct approaches to self-efficacy have been called self-efficacy for performance and self-efficacy for learning (Schunk, 1996). Another way to understand this distinction is to contrast the contexts in which they are most likely to operate. For example, Marty is a new college student. She is new to the experience of college coursework and has never passed a college test or exam. Consequently, Marty might not have beliefs in place regarding her likelihood of success (self-efficacy for performance) but might have strong positive beliefs about her ability to learn (self-efficacy for learning) because she did well in what she believes to be a similar setting—her high school Advanced Placement classes. On the other hand, perhaps a sophomore student named Norm has passed his first two semesters of Spanish with A grades in both courses. He is taking the third semester course from the same professor and, upon seeing the syllabus on the first day of class, recognizes the structure of the course to be the same. Norm is likely to have a high level of self-efficacy for performance, believing he will do well in the course in the same way he did in his previous two. Correspondingly, the items in the MSLQ Self-Efficacy for Learning and Performance scale ask the
respondents to rate both their beliefs that they will do well in the course and receive excellent grades as well as their confidence in their ability to master the skills being taught in the course and to understand basic and complex material (Pintrich et al., 1991).

This scale differs from the Control of Learning scale in that it is less interested in control of the causes of success and more interested in confidence in success. Students who believe strongly in their ability to master a task and succeed at it will score highly on the Self-Efficacy for Learning and Performance scale. In early analyses of the MSLQ’s fifteen scales, this scale was found to correlate most strongly with a student’s final course grade (r=.41).

Because strong correlations such as this were found between self-efficacy and both performance and achievement in a variety of settings, self-efficacy has been studied extensively in order to further understand how people’s beliefs about their abilities can lead to better outcomes on a variety of measures. Pajares (1996) provides a summary of the findings in this research.

Efficacy beliefs help determine how much effort people will spend on an activity, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations—the higher the sense of efficacy, the greater the effort, persistence, and resilience. Efficacy beliefs also influence individuals’ thought patterns and emotional reactions. People with low self-efficacy may believe that things are tougher than they really are, a belief that fosters stress, depression, and a narrow vision of how best to solve a problem. High self-efficacy, on the other hand, helps to create feelings of serenity in approaching difficult tasks and activities. As a result of these influences, self-efficacy beliefs are strong determinants and predictors of the level of accomplishment that individuals finally attain. (p. 544-545)
Bandura, who originally identified and defined the self-efficacy construct, continued his research and was joined by many others, especially from the field of educational psychology, in studying the construct. An important discovery early on in this research was the necessity of studying self-efficacy in relation to a specific task or activity, such as using certain study strategies or solving mathematics problems, rather than as a global concept or personal trait. Consistently, when the task and domain specificity of the self-efficacy construct is not recognized, effects are weakened (Pajares, 1996).

Another important consideration in studying self-efficacy is the proliferation of concepts that are related to self-efficacy but are not the same. For example, a study distinguishing between self-efficacy and self-concept found college students’ self-efficacy for mathematical problem solving having a greater impact than self-concept on academic performance. The same was also true when comparing the influence of efficacy beliefs with that of perceived usefulness of the task and prior experience doing the task (Pajares & Miller, 1994). In fact, self-efficacy was found in a series of studies (Pajares & Kranzler, 1996) to have as great an impact on academic performance as general mental ability (also referred to as intelligence or “g”). Thus, a college student’s intellectual ability and the college student’s judgments about that ability can be said to be equally important in predicting the level of achievement that student will reach.
In more recent studies, self-efficacy has been studied in its relationship to other constructs. Most often these relationships are reciprocal where both constructs affect one another. One such interrelationship that is particularly strong is that between goal orientation and self-efficacy. Hsieh, Sullivan, and Guerra (2007) and Carmona, Buunk, Dijkstra, and Peiro (2008) demonstrated this connection in their studies. In an attempt to understand factors influencing student attrition and underachievement, Hsieh, Sullivan and Guerra (2007) found that high self-efficacy in college students strongly correlated with the adoption of mastery goals and low self-efficacy correlated with adoption of performance-avoidance goals. This was especially true of students on academic probation. The authors theorized that this may be because these students responded to being labeled as students on academic probation. This label lessened their confidence and belief in their success and they therefore adopted performance-avoidance goals in an effort to avoid being found lacking in their ability. Consequently, because students with performance goals are least likely to seek help because of the risk of appearing stupid to others, they may perform poorly, lowering their self-efficacy for future related tasks. Thus, these beliefs about their ability and the kind of goals they adopt combine to sabotage their success. The authors suggest that instructors attend to both a student’s self-efficacy and their goal orientation in seeking to provide interventions to improve student success and help students avoid self-sabotaging behaviors.
Another construct that can sabotage a student’s success is measured by the sixth scale on the MSLQ: test anxiety. This scale measures the affective component of motivation. Unlike the other MSLQ scales, the score on the test anxiety scale has an inverse relationship with both a student’s expectancy of success and that student’s academic performance (Pintrich et al., 1991). In other words, a higher measure of test anxiety in a student correlates with both a lower measure of expectancy for success and lower course grades. The coefficient alpha for this scale is .80.

Test anxiety is a complex construct but is generally defined as “the set of phenomenological, physiological, and behavioral responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation” (Zeidner, 1998, p. 17). As such, it has both a cognitive and an affective aspect. The cognitive aspect refers to the students’ worry and negative thoughts that disrupt their ability to perform well. This cognitive aspect has been shown to have the greatest influence on a student’s academic performance (Pintrich et al., 1991; Bembenutty, McKeachie, & Lin, 2000). The MSLQ’s Test Anxiety scale measures the cognitive aspect with items that ask the respondents to report what they are thinking about while taking a test, such as how poorly they are doing or what the consequences of failing might be.

The affective aspect concerns the physiological arousal state that results from the negative emotions the student is experiencing. Items on the MSLQ
measure this component by asking whether respondents perceive that their heart rates speed up while taking a test or they experience an upset or uneasy feeling during test-taking. Bandura’s (1989) work on self-efficacy revealed that the link between physiological reactions such as test anxiety and performance in a task was the effect on an individual’s confidence in their ability to perform that task.

Text anxiety is not only related to a student’s sense of self-efficacy but also relates to the way students think about, plan, monitor and regulate their learning. Spada, Nikcevic, Moneta, and Ireson (2006) found that text anxiety strongly correlated with measures of metacognition and subsequent choices of study strategies made by students. The study found that the more likely students were to hold positive beliefs about worry and negative beliefs about their ability to control outcomes, the higher their reported levels of text anxiety. For example, students that reported a belief that worrying helped them to cope and that when they start worrying they are unable to stop would be more likely to experience test anxiety. Conversely, the stronger their beliefs and confidence in their cognitive abilities, the less test anxiety they would report.

In a comprehensive study of the effects of text anxiety on academic performance of undergraduate and graduate students, Chapell, Blanding, Takahashi, Silverstein, Newman, Gubi, and McCann (2005) found that undergraduate students reporting a low level of text anxiety had significantly higher GPAs than those reporting either a moderate or high level of test anxiety. Although the effect size was small, on average the difference between a B and
B+, this finding does support the contention that test anxiety affects a student’s academic performance. Notably, this study employed different norms for categorizing low, moderate, and high levels of test anxiety for freshmen than for students at other class levels because of previous research completed by Spielberger (1980) showing that freshmen experience higher levels of test anxiety than other students.

Test anxiety is the sixth and final motivation scale on the MSLQ. Together the six scales discussed so far reflect the Components of Motivation Model (see Figure 3) posited by McKeachie, Pintrich, Lin and Smith (1986) in their early work. The work of this same team of researchers on the Taxonomy of Learning Strategies (see Table 1) formed the basis for the second major section of the MSLQ: the Learning Strategies Scales.

Research on Use of Learning Strategies

The final nine scales on the MSLQ measure students’ use of various learning strategies. These nine scales are subdivided into two categories. The first category is Cognitive and Metacognitive Strategies, which contains five scales: Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation. The second category is Resource Management Strategies, which contains the remaining four scales: Time and Study Environment, Effort Regulation, Peer Learning, and Help-Seeking (see Table 2). The MSLQ served as a helpful instrument in advancing knowledge about how
students use these strategies in learning and how their use of these strategies has an effect on their academic performance and success. Each of the nine Learning Strategies scales will be described and elaborated upon in the following pages.

Rehearsal

The learning strategy of rehearsal involves repeating or reciting a list of items in order to encode the information in the memory. Items that measure use of rehearsal on the MSLQ refer to memorizing key words and repeating class notes to oneself while studying. The coefficient alpha for this scale is .69 (Pintrich et al., 1991).

Rehearsal is often categorized as a surface-level study strategy rather than a deep strategy because it does not result in connections between the information to be learned and prior knowledge. However, some authors distinguish between shallow rehearsal strategies such as simple repetition for the purpose of recall and deep rehearsal strategies such as using mnemonic devices where such connections begin to be made and a second level of processing information is required (Lyke & Kalaher Young, 2006, VanderStoep & Pintrich, 2003).

According to Simpson, Olejnik, Tam, and Supattatham (1994), “research studies have generally concluded that verbal rehearsal (a) can improve retention of material, (b) is a developmental skill that improves with age, and (c) must match the processing demands of the criterion task to be effective” (p. 267). That is, activities such as reciting a list of main points from a text can help a student
remember the material and can be done more effectively as a student matures. However, the choice of strategy must match the task at hand and will only be effective when it does.

This match between task and strategy was investigated by Lynch (2007). He compared faculty perceptions of the learning strategies needed for success in their courses with college students’ reported use of learning strategies. While students reported rehearsal strategies as the most commonly used, faculty rated deeper learning strategies such as elaboration, organization and critical thinking as most important and necessary for success in their courses.

A student’s choice of rehearsal as a study strategy is related to their motivation levels in a course. Lyke and Kalaher Young (2006) found that students with higher measures of extrinsic motivation tended to use more surface strategies while those with higher measures of intrinsic motivation tended to use deeper study strategies. In addition, classroom environments perceived as focusing on the task of learning rather than the performance of students resulted in more use overall not only of rehearsal but other cognitive strategies as well.

When investigating the use of rehearsal in a chemistry course, Zusho, Pintrich and Coppola (2003) found that the use of rehearsal increased students’ academic performance. Average achievers in the chemistry course used rehearsal throughout the course as a primary study strategy. Higher achievers,
on the other hand, used rehearsal less often and elaboration, the next study strategy discussed here, more often as the semester progressed.

Simpson, Olejnik, Tam, and Supattathum (1994) discuss the value of enhancing the use of rehearsal by combining it with elaboration in the form of elaborative verbal rehearsals. In their study with high-risk college students, students that prepared for a test by creating elaborative verbal rehearsals did significantly better on the test than a control group who had only used verbatim rehearsal in test preparation.

Elaboration

These discoveries about the use of rehearsal and elaboration are consistent with a common practice in the literature of categorizing study strategies as either surface strategies or deep strategies. Deep strategies are viewed as more adaptive than surface strategies because deep strategies call for more complex processing of the material and, therefore, lead to improved long-term retrieval of information (Zusho, Pintrich & Coppola, 2003). Elaboration is one of these deep strategies. Elaboration involves building connections between new information and prior knowledge. This can be done through paraphrasing, summarizing, creating analogies and certain methods of note-taking (Pintrich et al., 1991). The items on the MSLQ measuring the use of elaboration ask students to report whether they commonly write summaries of what is learned; pull together information from lectures, readings and discussions while studying; or relate
concepts learned in class with those learned previously or in other courses. The coefficient alpha for the Elaboration scale is .76 (Pintrich et al. 1991).

Willoughby, Wood, and Khan (1994) demonstrated that elaboration is better used when learners have a well-developed knowledge base in a domain and are adding to it rather than when learners are entering a new domain of knowledge. In their experiments, when university students encountered unfamiliar material, there was no difference in learning gains whether those students used elaboration or rehearsal strategies.

Balch (2005) studied the use of three different types of elaboration on learning psychology terms for a test. The three types of elaboration were examples, paraphrases, and mnemonic techniques. When students prepared for a test using examples or mnemonics, they performed significantly better on the associated test than those who prepared by studying repeated definitions. Despite the fact that students reported all three types of elaboration as being helpful to their learning, there was no significant difference in test scores between those who studied using repeated definitions and those who studied using paraphrases of the definitions.

Organization

Another deep learning strategy measured on the MSLQ is organization. Like rehearsal and elaboration, organization is a basic way of understanding the course material. Organization as a learning strategy is based on a cognitive-
constructivist approach to learning where new and prior knowledge are integrated (Herman, 1998). Pintrich (2004) categorizes organization as a deep rather than surface learning strategy. Organization involves the student in the learning task through clustering ideas, outlining material to be studied, or selecting main ideas in readings or lectures (Pintrich et al., 1991; Lynch, 2007). MSLQ items measuring the use of this strategy ask respondents to report their use of these techniques and others such as making charts, diagrams or tables. The coefficient alpha for the Organization scale is .64 (Pintrich et al., 1991).

Herman (1998) discusses his use of a teaching strategy in a psychology course that helps students learn this kind of organization. He found that student’s use of this strategy led to improved mastery of concepts and terminology in his course and improved ability to transfer knowledge from the course into practical contexts later.

Studying students’ use of learning strategies over time in a chemistry course, Zusho, Pintrich, and Coppola (2003) found that students use of organization as a learning strategy increased throughout the semester. In a study of use of learning strategies in various disciplines, VanderStoep, Pintrich, and Fagerlin (1996) found that use of organization as a learning strategy significantly increased performance in humanities-based courses while use of rehearsal, elaboration and metacognitive self-regulation did not have a significant effect.
Paulsen and Feldman (2007) found that students’ epistemological beliefs about the certainty of knowledge are positively related to their use of organization. In particular, the more certain they think knowledge is, the more they use organization as a strategy in their learning. This result is unique to organization as a learning strategy.

**Critical Thinking**

The MSLQ also provides a way to measure Critical Thinking, a cognitive strategy of much interest to many educators. Pintrich et al. (1991) describe critical thinking as “applying previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations with respect to standards of excellence” (p. 22). MSLQ items used to measure the degree to which a student uses this strategy ask the student to report how likely they are to question or develop alternative explanations for what they hear or read in the course; evaluate supporting evidence for theories, interpretations or conclusions presented in the course; or develop their own ideas about the concepts being taught in the course. The alpha for this scale is .80 (Pintrich et al., 1991).

While critical thinking was not a strategy included in the Taxonomy of Learning Strategies developed by McKeachie et al. (1986), their early work acknowledges the importance of transferring learning to other contexts and applying content learned to solve problems or evaluate ideas. Critical thinking
differs from the other learning strategies in that it is not as much a way of mastering subject matter as it is applying and using it.

An early study of critical thinking, values and attitudes of college students conducted by Lehmann (1962) showed that students improved significantly in their ability to think critically between their freshman and senior years. During the same time they developed an openness to new ideas and showed fewer stereotypical beliefs. In addition, this study found that most of this change occurred during the freshman and sophomore years.

In a 1992 study, Garcia and Pintrich examined how critical thinking related to motivation, learning strategies and classroom experiences. They then studied how these relationships vary according to the subject matter of a course. They found critical thinking to be positively related to the use of elaboration as a learning strategy and to metacognitive self-regulatory strategies across the three disciplines examined: English, biology and social science. Measures of critical thinking were not related to use of rote rehearsal as a learning strategy and this outcome led to the conclusion that critical thinking was related to deep rather than surface information processing strategies. Moreover, perceived course difficulty and the amount of collaborative learning in which the students were engaged were related to measurements of critical thinking. After adjusting for the other variables of concern in the study, the English students in this study had the highest levels of critical thinking while the biology students had the lowest (Garcia & Pintrich, 1992).
Critical thinking in a leadership course was examined by Burbach, Matkin, and Fritz (2004). Their study confirmed that critical thinking can be learned and that active learning methods, such as service-learning, journal writing or small group discussion are most likely to result in gains in critical thinking. The gains observed were related to the teaching method used in the course.

This finding confirmed earlier studies of how teaching methods influence growth in critical thinking. In a sociology class, Weast (1996) modified his teaching techniques to promote critical thinking among his students. After teaching students strategies for identifying and evaluating assumptions, evidence, reasoning and cause and effect arguments in writing on current issues, Weast found that students in his course outperformed those in a traditional sociology course. In fact, the students with the lowest cumulative grade point average (GPA) in his course did significantly better on a measure of critical thinking than those with the highest cumulative GPA in the traditional course.

Tsui (1999) also found instructional technique to be key in increasing critical thinking skill. Her study showed that students reported more growth in critical thinking after having a paper critiqued by an instructor, conducting an independent research project, working on a group project, giving a class presentation or taking an essay exam. These students did not report growth in critical thinking in relation to taking multiple choice exams.
In investigating the effectiveness of a teaching method called dialogical instruction, Reiter (1994) used the MSLQ scales to assess college students’ self-reported critical thinking, task value, intrinsic motivation, and self-efficacy. The students participated in ecology, literature and philosophy courses taught using dialogical instruction, a technique that seeks to stimulate learning by creating cognitive dissonance in the learner. While finding a statistically significant relationship between dialogical instruction and critical thinking only among students in the literature course, she consistently found measures of critical thinking to relate to measures of the motivational constructs of task value, intrinsic motivation, and self-efficacy. In general, the students who reported higher levels of these motivational constructs also had higher scores in critical thinking.

Rugutt and Chemosit’s (2009) study yielded a similar finding about the relationship of motivation to critical thinking. These researchers investigated the ability of peer relationships, student-faculty interaction and critical thinking skills to predict student motivation. They found that critical thinking skills accounted for six % of a students’ motivation while the three constructs together accounted for 40.7 %. A conclusion of their study is that it is “important to note that understanding of individual and institutional factors related to student motivation in learning are important professional issues and there is need [for] further research on this important area” (p. 24).
**Metacognitive Self-Regulation**

Metacognitive Self-Regulation, the next construct measured on the MSLQ, refers to engaging in the processes of planning, monitoring, and regulating one’s own cognition or thinking. Metacognitive Self-Regulation is one aspect of the larger concept of self-regulation. Self-regulation has arguably become the most fruitful direction for future research in improving the learning and achievement of college students. Since the development of the MSLQ, theories of self-regulation have expanded to include self-regulation of cognition, behavior, context, and motivation or affect (see Table 3; Pintrich, 2004). In fact, in a tribute to Pintrich after his untimely death in 2003, his colleague Schunk (2005) cites the conceptual framework for studying self-regulation that Pintrich developed as one of his greatest contributions to his field.

Metacognitive self-regulation differs from metacognition or metacognitive knowledge. Metacognition is the process of thinking about one’s thinking. For

**Table 3**

Conceptual Framework for Studying Self-Regulation

<table>
<thead>
<tr>
<th>Phases of Self-Regulation</th>
<th>Areas for Self-Regulation</th>
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</thead>
<tbody>
<tr>
<td>Forethought, planning, activation</td>
<td>Cognition</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Motivation</td>
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<tr>
<td>Control</td>
<td>Behavior</td>
</tr>
<tr>
<td>Reaction, reflection</td>
<td>Context</td>
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</table>

instance, metacognition is occurring when one is tracing one’s train of thought from one idea to the next or analyzing how a problem was solved. Metacognitive knowledge includes knowing strategies that can enhance one’s thinking and how to use those strategies. Metacognitive self-regulation, however, involves the process of putting metacognitive knowledge into practice by, for example, noticing how a particular strategy is leading one toward or away from a goal, or matching the kind of thinking one is doing to a particular problem or context (Pintrich, 2002).

In the early development of the MSLQ, items were created to measure distinct metacognitive strategies that were part of the Taxonomy of Learning Strategies. These were Planning Strategies, Monitoring Strategies, and Regulating Strategies. However, in factor analyses of the MSLQ instrument, items measuring planning, monitoring and regulating all loaded onto one factor. In other words, these strategies were so closely correlated with one another that if one was measured, all were measured. Thus, Pintrich and his colleagues collapsed planning, monitoring and regulating into one scale called Metacognitive Self-Regulation. The reasoning behind this was that if a respondent reported using one of these strategies, they tended to report using the other two. So, the measure of Metacognitive Self-Regulation on the MSLQ reflects the use of all three processes: planning, monitoring and regulating.
For this reason, the Metacognitive Self-Regulation scale contains twelve items, the largest number of items of any MSLQ scale. These items address the frequency with which respondents set goals for their learning, notice when they are confused or not paying attention, and adjust their activity accordingly. Planning, the first of three processes involved in metacognitive self-regulation, serves to activate prior knowledge by analyzing the task to be accomplished and setting goals so that the new material can more easily be comprehended and organized. Monitoring involves tracking attention and self-testing to assist in integrating new knowledge with old. Regulating involves correcting and continuously adjusting cognitive activities during learning. The coefficient alpha for this MSLQ scale is .79 (Pintrich et al., 1991).

A significant development in research on the influence of self-regulation on achievement was a study undertaken by Zimmerman and Martinez Pons (1986) to develop and test the use of a structured interview in assessing the self-regulation of high school students. They divided their sample into high and low achievement groups and found that 93% of students could be correctly classified into their achievement group based on their responses to questions about how they regulated their learning. Of the fifteen aspects of self-regulation drawn from social learning theory, all but one were significantly related to a student’s achievement group membership. The aspects of self-regulation studied included goal-setting and planning, keeping records and monitoring, seeking information, reviewing learning materials and seeking assistance from others.
This research study was important not only for showing the contribution of self-regulation to academic success, but also for showing that a student’s degree of self-regulation was more important than the students’ ability in determining that success. Further analyses of the data in this study showed that a student’s use and consistent use of self-regulatory strategies was a reliable predictor of their performance on a standardized test.

Another significant and interesting finding came from an early study using the MSLQ done by Pintrich and DeGroot (1990). Again, self-regulation emerged as the best predictor of academic performance. In addition, the metacognitive self-regulation scale was highly correlated with the use of cognitive strategies such as rehearsal, elaboration, and organization and proved to be the best predictor of academic performance. This means that metacognitive processes are at work when students plan to use cognitive strategies in learning, monitor how those strategies are working and adjust their use of strategies.

As studies such as these continued, self-regulated learners came to be defined as those who a) are aware of and use strategies to achieve learning outcomes, b) have a feedback loop in place that allows them to monitor and react to what they observe, and c) have motivated reasons to proactively use strategies (Zimmerman, 1990). Planning enables the learner to identify the most appropriate strategies for the learning task at hand. Monitoring is essential to the self-regulation process and enhances learning by allowing students to
discriminate between strategies that are effective or ineffective. They can then recognize the need to engage in regulating processes, choosing different strategies or resuming lost attention and control of thought processes (Demetriou, 2000; Zimmerman & Paulsen, 1995).

But self-regulation not only influences students’ choice and use of learning strategies, it also influences and is influenced by the student’s motivation. Pintrich and Garcia (1994) state that “different levels of self-regulated learning may be partially accounted for by students’ self-beliefs” (p. 117). For example, students who attribute past success in biology to employing elaboration and organization strategies while studying for an exam may be more likely to plan ahead to use those same strategies on the next exam. Pintrich and DeGroot (1990) studied these links between self-regulation and various aspects of motivation measured by the MSLQ. Students with strong measures of intrinsic goal orientation and self-efficacy were more likely to self-regulate. Because of the links between motivation and self-regulation, Pintrich and Garcia (1994) advocated further research into self-regulation among college students because they had encountered so many college students who were motivated and wanted to succeed but did not seem to be able to follow through in the midst of college life and its various distractions.

Boekaerts and Niemivirta (2000) point out, however, that college students often need to be convinced to acquire the skills of self-regulation. They attribute this need to beliefs students have about the role of instructors—that
instructors are the ones who will plan, monitor, and regulate the students’
learning, providing the feedback, motivation and resources needed for them to
learn. However, the strong ties between student motivation and achievement
should spur educators toward further research on effective methods of creating
self-regulated learners who have both the skill and the will to learn (Garcia,
1995).

*Time and Study Environment Management*

In addition to regulating their metacognition, students must also learn to
regulate resources. The remaining scales of the MSLQ address various resources
available to students. Two of these resources are the time available to them and
the environment in which they study. Students’ skill in managing these two
resources is measured in one scale on the MSLQ called Time and Study
Environment Management. The two strategies are combined into one scale for
the same reason that the planning, monitoring and regulating strategies were
combined in the Metacognitive Self-Regulation scale—in early analyses of what
became the MSLQ items, these factors loaded together. In other words, these
tests showed that measuring one was virtually the same as measuring each
separately so only one scale was needed (Pintrich, 2004).

Time management refers to students’ ability to effectively schedule, plan
and use opportunities for study. Management of the study environment would
require creating an organized, quiet, and distraction-free setting in which to do
work assigned in class (Pintrich et al., 1991). The items on this scale ask the respondent to report whether or not they have a study schedule, make good use of their time in studying for the course, review their notes, attend class regularly, have place set aside for study and can concentrate in the location where they study. The scale has eight items and the coefficient alpha for the scale is .76 (Pintrich et al., 1991).

Effective time management has been shown to increase academic achievement. Britton and Tesser (1991) conducted a study that examined college students’ self-reported time attitudes, short-range planning and long-range planning. Time attitudes included whether students felt they were in charge of their own time and could make constructive use of it. The authors noted that this quality was similar in definition to self-efficacy in its emphasis on a person’s belief and confidence around a certain task. Short-range planning referred to setting goals, prioritizing tasks, making lists and schedules and starting the day with a clear idea of what they would do in it. Both time attitudes and short-range planning were predictive of grade point average. In fact, when students’ scores on these two measures of time management were compared with measures of grade point average (GPA), the time management measures were more closely related to achievement than SAT (Scholastic Aptitude Test) scores. That is, students’ time management skills were better predictors of their academic performance than was a standardized test of scholastic aptitude.
Long-range planning, setting monthly or semester goals and schedules, was not found to be predictive of GPA in this study.

In another study, conducted almost two decades later by Kitsantas, Winsler, and Huie (2008), time management was also found to predict academic performance as well as self-efficacy. More specifically, measures of skill in time management predicted grade point average at the end of the sophomore year.

Understanding of study environment management as a strategy for learning evolved from research by Zimmerman and Martinez Pons (1986). In studying students’ ability to self-regulate, a factor called environmental restructuring was one of those found to relate significantly to a student’s level of achievement. The more likely they were to mention changing their environment as a study strategy, the more likely it was they were part of the high achieving group. Later work by Wolters (1998) found that when students were asked what they would do to cope with motivational problems and complete a task while studying, 14% of responses cited strategies that could be classified as attempts at environmental restructuring: e.g., find a quiet room, drink some coffee, or take a short break. While there is no indication that this led them to more meaningful study, learning, or achievement, it does indicate that the environment is relevant to students’ understanding of how to achieve academic success.
Effort Regulation

In the same way that making changes to one’s external environment can be a strategy for learning, making changes in one’s internal environment through regulating effort can also be a strategy for learning. Effort regulation is a process of monitoring and adjusting the amount of energy expended on an academic task despite distractions or lack of interest in the subject matter. Effort regulation is a kind of self-regulation; but while the Metacognitive Self-Regulation scale measures monitoring and adjusting of cognition, the Effort Regulation scale measures the monitoring and adjusting of affect. The four items that make up this scale ask respondents to report the frequency of persistence or attempts to succeed at a task when feeling lazy, bored, overwhelmed, or uninterested. The coefficient alpha for this scale is .69 (Pintrich et al., 1991).

Garcia (1995) called self-regulation of learning “a fusion of skill and will.” (p. 29). Skill in using cognitive strategies such as elaboration or rehearsal is required of self-regulated learners. But the will is also needed to regulate emotions or affect. In fact, the ability to regulate affect affects the regulation of cognition because a student must have the will to expend effort in the use of cognitive strategies. And because the use of cognitive strategies improves academic achievement, effort regulation is, therefore, vital to academic achievement.

Strage (2007) studied the circumstances under which students would be willing to work hard. She found that students reported expending more effort
in major courses than in elective courses and in courses where they connected with the professor than in courses where they did not. Similarly, they reported expending more effort in courses they perceived as interesting than in courses they perceived as uninteresting. This may be why one effort regulation strategy is to think about the task in such a way as to make it more interesting (Hidi & Harackiewicz, 2000). Increased effort in Strage’s (2007) study was positively related to GPA, self-reported perseverance, ability to remain involved in the task and better rapport with instructors.

An investigation of variables related to students failing an exam was conducted by Diseth, Palleson, Brunborg, and Larsen (2010), a group of researchers in Norway. They found that students who failed the exam scored lower in effort, motivation for learning, and use of deep learning strategies. When they examined the data collected from students who failed to take the exam at all, they found no difference in use of deep or surface learning strategies between this group and the group that passed the exam. However, the difference found was that the students who failed to take the exam scored lower in effort and motivation for learning. These results lend support to two hypotheses: 1) that effort improves academic achievement and 2) that effort is needed to activate the use of learning strategies.

These studies address the links among effort, achievement and learning strategies. But much of the literature related to effort regulation addresses why students do not expend effort even when they know it is necessary for
achievement. One common response to this question has been that learners reduce effort in order to protect their view of themselves as able and competent. In other words, they believe that if they expended effort on a test and did not do well, it would mean they were less able; therefore, if they think they will get a low score, they will reduce effort so as not to risk being seen as less able.

Jagacinski and Nicholls (1990) tested this hypothesis in an experiment with college students and found no evidence to support it. In fact, they found that students were not in favor of reducing effort to avoid being seen as incompetent. Neither were they in favor of reducing effort in order to give others a positive impression of their ability. The report of this study concluded with some suggested reasons why effort might be reduced. First, students may reduce effort when their commitment to a task wanes. Or they may lose awareness of the amount of effort they are expending, thereby failing to monitor or regulate their effort. This study also found that the expenditure of effort is more important to students when trying to impress an instructor than when trying to impress peers and that students see low effort as more likely to be shown by others than themselves.

Dweck (2007) links effort regulation to conception of intelligence. She posits that students may reduce their effort because they view effort expenditure as necessary only for students who lack intelligence. Wanting to appear intelligent, therefore, is incompatible with expending effort. Furthermore, she suggests that students who believe intelligence is a fixed ability that cannot
change will be less motivated to expend effort than those who believe that intelligence is knowing how to learn. When conducting a series of workshops for children, she found that students who were praised for being intelligent gave up more quickly and performed less well over time. The students who were praised for their effort, on the other hand, were more confident and continued to improve over time.

*Peer Learning*

The final two scales on the MSLQ measure resource management strategies in which the resource takes the form of support from other people. The Peer Learning scale measures to what degree a student collaborates with peers to increase understanding of course material. The three items for this scale ask respondents to address how often they set aside time to discuss material with a study group or try to explain the course concepts to a classmate or friend. The coefficient alpha for this scale is .76 (Pintrich et al., 1991).

Positive peer relationships are related to increased motivation (Rugatt & Chemosit, 2009), but very little research has been done concerning other outcomes of informal peer learning. More research has examined the impacts of formal or structured peer learning, where peer learning is used as an instructional technique. An example of this kind of peer learning is peer tutoring, where the process of learning from a peer is formalized in a tutor-student relationship. Bruffee (1999) examined the dynamics of peer tutoring and
found several positive effects. Tutors helped students to organize and to add
detail to their writing. The students who received the tutoring were higher in
self-confidence and lower in anti-academic and anti-intellectual attitudes.
Bruffee states that having a “sympathetic, knowledgeable peer” (p. 102) resulted
in students realizing that they knew more than they thought that they did.

A study by Kapatinoff (2009) found that collaborative testing, where
students work together on responses to examination questions, led to increased
test scores and self-confidence and decreased self-reported test anxiety. These
outcomes were significantly related to the student’s self-reported use of three
cognitive processes—retrieving information, thinking through information, and
engaging in quality discussions.

Retention researchers Cartney and Rouse (2006) found that small group
learning can be an effective way to integrate students into university life, thus
achieving the institutional integration promoted by retention research. They
suggest that small group learning may be effective because the small group
provides a sense of belonging and identity and can serve the function of families
often left behind when coming to campus.

Arendale (2005) states that the students most likely to benefit from peer
cooperative learning groups are least likely to participate. He suggests that this
may result from fear of academic weaknesses being exposed. Others posit that
lack of interest or knowledge, fear, passivity, or embarrassment may be the
reason for non-participation in group learning (Karabenick & Sharma, 1994).
Arendale recommends that more research be done on motivation at the postsecondary level in order to understand how to motivate students to voluntarily participate in learning groups and to adopt new academic behaviors that will contribute to their success.

**Help-Seeking**

The last of the MSLQ scales is Help-Seeking. Because help can be sought from peers, it is not surprising that the correlation coefficient between the Help-Seeking scale and Peer Learning scale is .55. Other sources of help include instructors, peer tutors, or academic support service personnel. The four items measuring Help-Seeking ask the respondents to report how often they ask instructors for clarification on course concepts or identify and ask other students in the course for assistance. The coefficient alpha for this scale is .52 (Pintrich et al., 1991).

Karabenick and Knapp (1991) found that active learners who use more cognitive, metacognitive and resource management strategies also ask for more help. For this reason, these authors maintain that help-seeking should be portrayed as an achievement-related behavior rather than a dependent behavior.

Subsequent research on help-seeking defined two different categories of help-seeking. These are instrumental help-seeking and executive help-seeking (Karabenick & Sharma, 1994). Instrumental help-seeking occurs when a student requests the minimum amount of assistance necessary to complete a task. Most
often students seeking help in this way have mastery of the material or skill as their goal. This kind of help-seeking decreases dependency on the source of the help because the student acquires the needed knowledge or skill and transfers it to other contexts. In executive help-seeking, however, the student wants to have the answer given to them or the work done for them by the one they ask for help. Students employing this kind of help-seeking are motivated by a desire to minimize their participation or activity during the learning process. Therefore, executive help-seeking perpetuates dependency because students do not seek the knowledge or skill in a way that prepares them to use it independently.

Furthermore, Karabenick and Sharma (1994) identified relationships between help-seeking and goal orientation theory and between help-seeking and attribution theory. They posited that students with learning or mastery goals were more like to seek help while those with performance goals were less likely to do so. Similarly, students who attributed success or failure to task difficulty, luck or ability would be less likely to seek help while those who attributed success or failure to effort would seek help more often. In theory, the first group would find help-seeking irrelevant while the latter group would view help-seeking as a strategy they could employ to succeed.

However, the perceived threats or costs involved in help-seeking often interfere with students’ intentions to seek the help they need. Some of the costs identified by Karabenick and Sharma (1994) included a feeling of indebtedness to the one providing help, embarrassment that help is needed, and lower self-
esteem because the problem cannot be solved on one’s own. Because of these potential costs, students may prefer informal sources of help such as family, friends, or classmates which are perceived as less costly.

Newman (2002) promotes the benefits of help-seeking. “Help seeking can avert possible failure, maintain engagement, lead to task success, and increase the likelihood of long-term mastery and autonomous learning. Indeed, adaptive help seeking is a strategy of self-regulated learning” (p. 132). He goes on to discuss the competencies needed for help-seeking. These competencies are cognitive, social, motivational, and contextual. In order to seek help, the student must know when help is needed, that help is available, and how to form the question that will result in the needed assistance. In addition, the student must decide whom to ask and must do so in an appropriate way. Students’ goals, beliefs about themselves, ability to tolerate difficulty, willing to take risks, and sense of agency are also involved. For example, low-achieving students with poor perceptions of themselves are less likely to seek help. And finally, the grading system, expectations from teachers and others, and quality of teacher-student relationships can influence help-seeking behavior.

Because help-seeking is so complex, Newman (2002) recommends that teachers actively communicate support, making them less threatening to students and lessening student reluctance to seek help. Moreover, he recommends that educators not underestimate the nature of students’ peer relationships. The more important friendship and intimacy are to a student, the
more that student will value and use help-seeking as a strategy when faced with academic difficulty. If a students’ peer group does not value academic achievement, however, help-seeking is likely to be inhibited.

Clegg, Bradley, and Smith (2006) undertook a qualitative study of help-seeking by college students. They discovered that for a student, the decision to seek help can be a complex one. While they also found that peers seemed to be the least problematic source of help from the students’ perspective, students needed to be confident in the ability of a peer to help with the particular issue at hand. Students in their study reported feeling uncomfortable about asking tutors or university workers for help. These students also felt that seeking help represented inadequacy or failure on their part rather than self-reliance and ownership of problems.

Help-seeking is the last of the learning strategies measured on the MSLQ. Like research on motivational constructs, the research on use of learning strategies has many implications for practice in teaching and learning as instructors and administrators seek to help students reach their potential as learners.

Summary

The aim of this chapter has been to review the literature related to college student retention and to provide insight on how the study of college students’ motivation and use of learning strategies can aid university personnel in
increasing student persistence toward a college degree. Linking the retention theories of Tinto, Astin, Bean with the work of Bandura, McKeachie, Pintrich and others on motivation for learning can begin to show how students’ motivation and ability to learn relate not only to their level of achievement but also their decisions to continue their formal education.

Understanding and assessing students’ goal orientation, perception of task value, self-efficacy in the learning task, attribution beliefs, and levels of test anxiety can increase educators’ ability to respond to students’ needs and concerns and help them persist in pursuit of their learning goals. Understanding and assessing student’s use of rehearsal, elaboration, organization, critical thinking, metacognitive self-regulation, management of their time and study environment, regulation of effort, utilization of opportunities for peer learning, and their help-seeking behavior can assist university personnel in equipping students with the skills and resources needed to achieve those goals. The next chapter will describe the methods this study employed to understand and assess student motivation and use of learning strategies and to examine links between these constructs and behaviors and student achievement and retention.
Chapter III

METHOD

This chapter describes the methods used in this study. After reviewing the purpose and the research questions of the study, this chapter discusses the chosen research design. The chapter includes a description of the research participants, a detailed review of the instrument used in data collection including a history of its development and usage, and a thorough description of the data collection and analysis procedures. The chapter concludes with a discussion of internal and external threats to the validity of this study.

Purpose of the Study

The purpose of this study was to describe and compare patterns of motivation and use of learning strategies among freshmen and sophomores enrolled in a general education course and to examine the impact of these patterns on student success and retention. The intent was to provide information to the university’s administrators, instructors, advisors, and student development professionals concerning how to achieve their goal of increasing
student success and retention by supporting students’ development of beliefs and skills necessary for that success and for persistence toward a college degree.

Research Questions

Recent literature in the field of retention calls for an examination of psychological aspects of a student’s decision to persist in college (Bean & Eaton, 2000) and the effect of academic competence on students’ intent to persist (Ryan & Glenn, 2002). Because motivation is one of these psychological constructs and use of learning strategies is one measure of a student’s academic competence, this study explored and compared motivation and learning strategy use among two populations of interest in the study of retention, freshmen and sophomores. Attrition rates tend to be highest after the freshman year (ACT, Inc., 2002) and an estimated two thirds of college student gains in knowledge and cognitive skill are made during the first two years of college (Reason, Terenzini, & Domingo, 2006). For both these reasons, a study of how student motivation and use of learning strategies in the midst of these two critical years influences student success and retention seemed most appropriate.

In particular, the study sought to answer the following research questions:

Research Question 1: What pattern(s) of motivation and what use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?
Research Question 2: After controlling for prior achievement as measured by high school grade point average (GPA), what similarities and differences in the patterns of motivation and use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

Research Question 3: Is there a significant relationship between motivation or use of learning strategies and student achievement as measured by final course grade?

Research Question 4: Are MSLQ scale scores significant predictors of college student retention/persistence?

These research questions guided the collection of data and the choice of methods and procedures that were most appropriate in answering them.

Hypotheses

Research hypotheses and null hypotheses were defined for this study and were tested using statistical methods and procedures.

Research Hypotheses

The research hypotheses tested in this study were:

1) Controlling for high school GPA, sophomore scores on MSLQ scales will differ significantly from those of freshmen in the study.
2) There is a significant relationship between MSLQ scale scores and student achievement in the course as measured by final course grade.

3) MSLQ scale scores are significant predictors of student persistence into the following semester.

**Null Hypotheses**

The corresponding null hypotheses generated for statistical testing purposes for this study were:

1) Controlling for high school GPA, there are no significant differences between freshmen and sophomores in the motivation and learning strategy scales of the MSLQ.

2) There is no significant relationship between motivation and learning strategy scale scores and student achievement as measured by final course grade.

3) Motivation and learning strategy scale scores are not significant predictors of student persistence into the following semester.

Prior to data collection, statistics called alpha (α) and beta (β) are set as a measure of the probability of making false claims or errors concerning the research hypotheses or null hypotheses. There are two kinds of errors that can be made. A Type I error is rejecting the null hypothesis when it is correct. Alpha (α) measures the likelihood of this type of error. Alpha (α) is set at .05 for this study. This means that there was a five percent chance that one of the three
null hypotheses would mistakenly be rejected and a Type I error would occur. (Gall, Borg, & Gall, 1996; Cohen, 1992)

A Type II error is failing to reject the null hypothesis when it is not correct (Gall, Borg, & Gall, 1996). Beta ($\beta$) measures the likelihood of this type of error and is set at .30 for this study. This means that there was a thirty % chance that one of the three null hypotheses would not be rejected even though it is false and a Type II error would occur. Because the formula $1.0 - \beta$ determines the statistical power of a study, setting beta ($\beta$) at this level also established the statistical power of the study at .70 (Gall, Borg, & Gall, 1996; Cohen 1992).

Research Design

This study employed a cross-sectional design to explore, discover and compare patterns of motivation and learning strategy use among college students in a general education course using descriptive research methods.

Cross-sectional Research

In cross-sectional research, the investigator collects data at a single point in time from different groups at different ages or stages of development (Gall, Borg & Gall, 1996; Mertler, 2005). Cross-sectional designs are useful in developmental research when “people from different age groups are sampled and compared” (Leedy & Ormrod, 2005, p. 183). Cross-sectional surveys are
appropriate for collecting data on several variables from large numbers of
participants. However, they cannot measure change (Mertler, 2005).

This study fit the definition of cross-sectional survey research because
data was collected only once for the purpose of describing the research
participants’ motivation and use of learning strategies at a single point in time.
Responses from participants in each of two groups, college freshmen and college
sophomores, was collected by sending a link to an online version of the
Motivated Strategies for Learning Questionnaire (MSLQ) to 442 potential
participants via electronic mail. The data collection instrument used in this
study and the rationale for the required number of participants is examined
thoroughly in subsequent sections of this chapter.

Descriptive Research

The purpose of descriptive research is “to show status by first describing
and then, to the extent possible, interpreting present and past situations,
conditions, behaviors, interactions, events, and trends” (Mertler, 2005, p. 277).
This type of research increases knowledge about a topic of interest and
frequently aids in decision making. Descriptive research aids understanding of
the current state of people, places, situations, processes or conditions but does
not seek to determine their causes (Gall, Borg, & Gall, 1996; Mertler, 2005).
Researchers using descriptive research methods pose research questions and
often develop research hypotheses when two or more groups are being
compared. Primary data sources for descriptive research include participants, informants, settings, records, objects and documents. Interview guides or questionnaires are often used to collect data from informants. Questionnaires are most often used when distance or time constraints preclude interviewing each informant individually (Mertler, 2005).

Data obtained through descriptive research can be analyzed and presented verbally, statistically, or both. Descriptive statistics such as measures of central tendency (i.e. mean, median, and mode) or measures of variability (i.e. standard deviation, variance, and range) are often used to present data. Statistical methods used in analyzing data in descriptive research data include Chi-square analysis, t-tests, and analysis of variance. The conclusions presented at the end of a descriptive study provide responses to the research questions and hypotheses as well as an interpretation of them for the reader (Gall, Borg & Gall, 1996; Mertler, 2005).

This study, with the objective of describing variations in patterns of motivation and use of learning strategies among groups of college students, fit the criteria of descriptive research. In keeping with the purpose of descriptive research, the collected data described the participants’ level of motivation and use of learning strategies at the time a questionnaire was administered but did not attempt to provide evidence for the causes of those outcomes. The research was intended to increase understanding of motivation for learning and use of study strategies among college and university faculty and administrators that
could aid them in making decisions. Research questions and hypotheses were stated to guide the research. Descriptive statistics, measuring central tendency and variability, were computed and are presented in the following chapter.

**Potential Strengths and Weaknesses of Research Design**

One weakness of survey research is its reliance on self-report data. That is, the participants completing the questionnaire are reporting their beliefs about what has happened or their perception of their motivation levels rather than what has actually happened or what their motivation truly is. Participants may provide the responses they wish were true or their responses may be influenced by the particular setting or context in which they are completing the questionnaire (Leedy & Ormrod, 2005; Schwarz, 1999).

A second potential weakness of survey research is that questionnaires may have a low response rate (Leedy & Ormrod, 2005). In other words, because the researcher is dependent on completed questionnaires to obtain data and if the majority of those invited to complete a questionnaire choose not to do so, the data collected may not be truly representative of the group being studied.

Cross-sectional research designs have strengths and weaknesses as well. A strength of cross-sectional research is that data is collected once, avoiding the problems associated with participant attrition from the study. On the other hand, a weakness of cross-sectional research is that the researcher cannot confidently make certain inferences about what the data means. While the
researcher may find a significant difference between groups in the study, there is no way of knowing why that difference is present. Further, the data of different groups at different age levels cannot be correlated or used to make predictions (Leedy & Ormrod, 2005). In short, cross-sectional research is limited to describing a status at the time the data is collected and cannot be said to occur as a result of past events nor be used to predict future outcomes.

The implications of these weaknesses, or limitations, in the research design for the current study are discussed in a later section of this chapter.

Sampling Method and Participants

For the study to be valid, the groups of respondents to the questionnaire must be representative of the target population. This is known as a representative sample (Leedy & Ormrod, 2005). This section describes how the participants were chosen, the desired sample size and why it was important, as well as issues and problems related to sampling that required attention in this particular study.

The participants in this study were a convenience sample of college freshmen and sophomores at a private, mid-sized university in the Midwest. Convenience sampling includes participants that are readily available (Leedy & Ormrod, 2005). The participants were enrolled in sections of a general education course.
The targeted sample size \((n)\) for both the freshmen group and the sophomore group in this study was 100 respondents to the questionnaire in each group. This sample size \((n)\) is based on Gall, Borg, & Gall’s (1996) and Cohen’s (1992) discussion of statistical power analysis. Statistical power refers to the ability of a study to do what it is setting out to do—claim that evidence has been found to support a hypothesis and reject the null hypothesis. For this reason, if the null hypothesis is indeed false but the study fails to show that this is so, the study would have little to no power.

Statistical power analysis considers four aspects of the study: level of significance, directionality, effect size, and sample size (Gall, Borg & Gall, 1996). Each of these four aspects and their application to this study are explained in the following paragraphs.

First, the level of significance must be considered when analyzing statistical power. The level of significance is indicated by the alpha value \((\alpha)\) and refers to the probability of wrongly rejecting the null hypothesis. Because it refers to probability, it is also referred to as \(p\). A more powerful study will have a lower chance of committing an error and, therefore, a lower \(\alpha\) value. In other words, the less likely an error, the more powerful the study (Cohen, 1992). While Cohen (1992) states that \(\alpha\) values of .10 are acceptable for exploratory studies, the \(\alpha\) value for this study was set at .05, increasing its power. An \(\alpha\) or \(p\) value of .05 is most commonly used in practice (Gall, Borg, & Gall, 1996).
A second important element necessary in analyzing statistical power is directionality. Most of the time, one variable can differ from another in two directions. For example, a measure of variable A will sometimes be greater than that of variable B and sometimes less. If it were possible by the application of theory to specify in the research hypothesis which direction one variable would consistently differ from the other, the researcher could use a one-tailed significance test rather than a two-tailed significance test. Using one-tailed significance tests increases statistical power. However, because this study was intended to explore the pattern of relationships between variables and not enough was known to confidently state directionality, this study used two-tailed significance tests.

Thirdly, effect size must be examined in determining statistical power. Effect size (ES) refers to the magnitude or degree of observed differences detected between variables in the population being studied. The greater an effect size, the lesser the probability of committing a Type I error and incorrectly rejecting the null hypothesis. For this reason, as an effect size increases, the alpha value decreases and statistical power increases. Larger effect sizes, therefore, are desirable but cannot be manipulated by the researcher. Effect size is beyond the control of an investigator (Gall, Borg & Gall, 1996) who can only estimate it as small, medium, or large prior to data collection (Cohen, 1992). For the current study, a medium effect size was assumed.
And finally, sample size \((n)\) must be considered when analyzing statistical power. The larger the sample size, the greater the statistical power. This is because having more subjects in a sample increases the researcher’s ability to detect differences and relationships and reject the null hypothesis (Gall, Borg, & Gall, 1996). While greater sample sizes are always desirable, they are not always practical in research. For this reason, minimum sample sizes have been studied and charted by Olejnik (1984). His analysis recommends a sample size \((n)\) of 100 when using independent sample t-tests in studies where \(\alpha=0.05\), a medium effect size is assumed, and the statistical power desired is .7. Therefore, the desired sample size in this study was 100 freshmen and 100 sophomores.

The next important question to consider beyond the size of the sample is whether the sample was representative of the population being studied. Because the purpose of this study was to investigate, describe, and compare patterns of motivation and use of learning strategies among freshmen and sophomores and examine the effect of these patterns on success and retention, the population of interest was college freshmen and sophomores. Because the intent of the study was to provide useful information concerning student success and retention to administrators, faculty and student development professionals at a particular university, the target population then narrowed from college freshmen and sophomores everywhere to freshmen and sophomores at the university in question. Next, because the instrument used in the study measured motivation and use of learning strategies in relation to a particular course, the sample
needed to be drawn from freshmen and sophomores at the university enrolled in the same course. Surveying all freshmen and sophomores at the university would result in data that would not be comparable. For example, the measure of an individual’s self-efficacy in an Art course should, in theory, differ from a measure of that same individual’s self-efficacy in an Algebra course. Likewise, use of the rehearsal study strategy may be effective in learning Biology terms but not at all useful in writing an essay for an English course. Therefore, all students participating in the study had to be enrolled in similar courses in order to measure and compare their motivation and use of learning strategies.

Here the sample size once again becomes relevant. Because a sample size \((n)\) of 100 for both the freshman group and the sophomore group was needed, a course needed to be found that had over 100 freshmen and 100 sophomores enrolled in it for the study to maintain adequate statistical power and provide useful and valid results. At the university in question, this limited the researcher’s choice of courses from which to recruit participants to general education courses with a large number of both freshmen and sophomores enrolled.

Furthermore, it was necessary for participants to be chosen randomly in order for the sample to be truly representative of the population (Leedy & Ormrod, 2005). The necessity for participants to be enrolled in the same university course makes pure random sampling, where each member of the population has an equal chance of being involved in the study, impossible.
However, because the course in which students were enrolled was a general education course required of all students at the university, the course enrolled a representative cross-section of freshmen and sophomores at the university in any given semester including the ones in which the questionnaire was administered.

Another practical consideration in choosing participants for this study was that the university where the research took place is committed to small class sizes. This means that while there may be 100 freshmen and 100 sophomores enrolled in a particular course during a given semester, these students would be enrolled in different sections of the course with different instructors in different classrooms, meeting at different times of the day. While the various sections had the same course description and objectives, instructor teaching styles and assessment methods would affect student motivation and use of study strategies.

Finally, because the validity of the study depended upon the sample being truly representative of the population, demographic data was collected from the participants to confirm the degree to which the sample truly represented the target population of all freshmen and all sophomores at the university. Demographic information collected from the participants included class level, age, race/ethnic background, and sex. The demographic data can be used to explore various patterns in motivation and use of study strategies that may be useful to university administrators, faculty and staff in keeping with the overall purpose of the study.
Description of Instrumentation

For this study, the researcher collected data by way of a questionnaire, or instrument. This section will describe the instrument and its development, and provide evidence of its validity and reliability for use in answering the research questions and testing the hypotheses posed by this study.

The instrument used in the study was the Motivated Strategies for Learning Questionnaire (MSLQ). The MSLQ “is a self-report instrument designed to assess college students’ motivational orientations and their use of different learning strategies for a college course” (Pintrich et al., 1991, p. 3). The MSLQ uses 81 items to obtain scores for 15 scales. Six of the 15 scales measure motivational constructs while nine of the 15 scales measure use of learning strategies.

The Motivation section contains 31 items measuring the motivational constructs of Extrinsic Goal Orientation, Intrinsic Goal Orientation, Control Beliefs about Learning, Task Value, Self-Efficacy for Learning and Performance, and Test Anxiety. The second section contains 50 items that measure the use of the following learning strategies: Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self Regulation, Time & Study Environment, Effort Regulation, Peer Learning, and Help Seeking (Duncan & McKeachie, 2005). Table 4 shows the two major subsections, the 15 scales, a definition of the scale, and the range of scores possible for that scale.
The items on the MSLQ measure self-reported motivation for learning or use of learning strategies using a 7-point Likert-type scale (see Appendix A). Items on the instrument are statements to which the respondent circles a response ranging from “1” meaning “true of me” to “7” meaning “not at all true of me” (p. 119, Duncan & McKeachie, 2005). Some of the items are worded negatively and in scoring required the score to be reversed so as to measure the degree to which a construct was present (Pintrich et al., 1993). For example, item 52 reads I find it hard to stick to a study schedule. Because a response of 7 on this negatively-worded item would indicate that the respondent found this statement to be very true of me and would therefore indicate the absence of skill in the management of Time & Study Environment, the value for that item was reversed to a 1 while a response of 6 was reversed to a 2, and a 5 to a 3 and so on.

Scale scores for each respondent were calculated by computing the mean value of the responses to the items constituting that scale. For instance, because five items measure critical thinking, the response values on those five items were averaged to provide a score for the Critical Thinking scale (Garcia & Pintrich, 1995).

Table 4 lists and defines the 6 motivational constructs and 9 learning strategies measured by the MSLQ. The table also shows the number of items on the MSLQ measuring each construct and the possible range of scores for that scale. Scales with items requiring reverse scoring are also indicated.
Table 4

Motivated Strategies for Learning Questionnaire Scales

<table>
<thead>
<tr>
<th>Section</th>
<th>Scale</th>
<th>Definition</th>
<th>Number of Items in Scale</th>
<th>Possible Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation Scales</strong></td>
<td>Intrinsic Goal Orientation</td>
<td>“The desire to work because you enjoy the challenge of learning, you are genuinely curious, or you enjoy the feeling of understanding” (Vander Stoep, 2003, p. 276)</td>
<td>4</td>
<td>4-28</td>
</tr>
<tr>
<td></td>
<td>Extrinsic Goal Orientation</td>
<td>“The desire to work because you appreciate the external rewards” (p. 276)</td>
<td>4</td>
<td>4-28</td>
</tr>
<tr>
<td></td>
<td>Task Value</td>
<td>“The extent to which tasks are perceived as interesting, important, useful and worthwhile” (p. 278)</td>
<td>6</td>
<td>6-42</td>
</tr>
<tr>
<td></td>
<td>Control Beliefs about Learning</td>
<td>“The extent to which you believe your efforts will result in positive outcomes” (p. 275)</td>
<td>4</td>
<td>4-28</td>
</tr>
<tr>
<td></td>
<td>Self-Efficacy for Learning &amp; Performance</td>
<td>“Self appraisal of one’s ability to master a task” (p. 277)</td>
<td>8</td>
<td>8-56</td>
</tr>
<tr>
<td></td>
<td>Text Anxiety</td>
<td>“Nervous or anxious feelings during an exam or test; related to poor performance” (p. 278)</td>
<td>5</td>
<td>5-35</td>
</tr>
<tr>
<td>Totals</td>
<td>6 scales</td>
<td>31 items</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Learning Strategies Scales</strong></td>
<td>Rehearsal</td>
<td>“A low-level learning strategy that involves repeating information until it has been memorized “(p. 277)</td>
<td>4</td>
<td>4-28</td>
</tr>
<tr>
<td></td>
<td>Elaboration</td>
<td>“The process of building connections and associating information with material that is meaningful to you in order to achieve sophisticated understanding” (p. 275)</td>
<td>6</td>
<td>6-42</td>
</tr>
<tr>
<td></td>
<td>Organization</td>
<td>“The process of identifying important information, seeing relationships, and constructing connections between information” (p. 276)</td>
<td>4</td>
<td>4-28</td>
</tr>
<tr>
<td></td>
<td>Critical Thinking</td>
<td>“The ability to use acquired knowledge in flexible and meaningful ways, through understanding the problem or issue, evaluating evidence, considering multiple perspectives, and taking a position” (p. 275)</td>
<td>5</td>
<td>5-35</td>
</tr>
<tr>
<td></td>
<td>Metacognitive Self-Regulation</td>
<td>“Using both skill and will in learning; actively planning, monitoring, and controlling your own learning or behavior” (p.275)</td>
<td>12*</td>
<td>12-84</td>
</tr>
<tr>
<td></td>
<td>Time &amp; Study Environment</td>
<td>Effectively and efficiently allocating and using available time and choosing study locations so as to increase your productivity and success</td>
<td>8**</td>
<td>8-56</td>
</tr>
</tbody>
</table>
Table 4: Motivated Strategies for Learning Questionnaire Scales, continued

<table>
<thead>
<tr>
<th>Section</th>
<th>Scale</th>
<th>Definition</th>
<th>Number of Items in Scale</th>
<th>Possible Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Strategies</td>
<td>Effort</td>
<td>“Persistence in the face of difficulty or boredom” (p. 276)</td>
<td>4*</td>
<td>4-28</td>
</tr>
<tr>
<td>Scales</td>
<td>Regulation</td>
<td>“Working with school peers on course-related tasks and projects” (p. 277)</td>
<td>3</td>
<td>3-21</td>
</tr>
<tr>
<td></td>
<td>Peer Learning</td>
<td>“Using the resources of more competent people who are available to you” (p. 276)</td>
<td>4***</td>
<td>4-28</td>
</tr>
</tbody>
</table>

Totals 9 scales 50 items

Note. *=scoring for two items in this scale is reversed; **=scoring for three items in this scale is reversed; ***=scoring for one item in this scale is reversed. The quoted definitions are from Learning to Learn: The Skill and Will of College Success, (pp. 275-278), by S.W. VanderStoep and P.R. Pintrich, 2003. Columbus, OH: Prentice-Hall.

Development & Testing of the MSLQ

The MSLQ grew out of the work of researchers and educators Pintrich and McKeachie on college student motivation for learning and achievement at the National Center for Research to Improve Postsecondary Teaching and Learning. These individuals in conjunction with a team of researchers at the center created a Components of Motivation model (see Chapter 2, Figure 3) and a Taxonomy of Learning Strategies (see Chapter 2, Table 1), which defined the constructs that the MSLQ was subsequently designed to measure. In 1986, when the development of the MSLQ began, research had consistently shown that better academic performance and higher levels of cognitive engagement were linked with positive motivational beliefs. The greater the perceived self-efficacy, focus on learning or mastery goals, and value ascribed to the learning task, the more students would use learning strategies. Such use of learning strategies indicated higher cognitive engagement and led to improved academic achievement (Garcia
& Pintrich, 1995). Conversely, these same positive outcomes were found to be associated with low test anxiety. Thus, creating an instrument that could measure these constructs met a “genuine need for a tool to assess students’ motivation and learning strategies to help students and faculty improve learning” (Duncan & McKeachie, 2005, p. 117).

From 1986 to 1988, there were three major waves of data collection using items that McKeachie and Pintrich had developed to assess the effectiveness of a Learning to Learn course they had created and taught. Early versions of the MSLQ were administered to 326 students in 1986, 687 students in 1987, and 758 students in 1988. The students in these samples represented a four-year comprehensive university, a small liberal arts college, and a community college. After each administration, the questionnaire items were analyzed for internal reliability and factor analyses were conducted to group the items into scales. In addition, based on these analyses, items were rewritten, dropped, or added for the next wave of administration and analysis (Pintrich et al., 1993).

The final version of the instrument, representing ten years of work and multiple data collections, contains fifteen scales divided between two major sections (see Chapter 2, Table 2). The first section measures motivational constructs from the Components of Motivation model in three groups: values, expectancies, and affect related to learning. The second section measures the use of strategies included in the Taxonomy of Learning Strategies in two groupings: cognitive and metacognitive strategies and resource management strategies.
(Duncan & McKeachie, 2005). By including measures of both cognitive and motivational constructs in the MSLQ, the instrument reflected work being done in the field of self-regulated learning which emphasizes both cognition and motivation and seeks to understand how they interact (Zimmerman, 1990; Garcia & Pintrich, 1995).

**Uniqueness of MSLQ**

Because the MSLQ was firmly based in theory, it differed from the study skills inventories that existed and were being developed at that time. Many of the existing instruments focused on individual differences or learning styles and measured constructs as static traits. In particular, the MSLQ differed from the Learning and Study Strategies Inventory (LASSI) developed by Weinstein, Schulte and Palmer (1987) because the MSLQ took a more detailed look at the motivational aspects of self-regulated learning. A recent study (Muis, Winne, and Jamieson-Noel, 2007) comparing the MSLQ to the LASSI and to another instrument called the Metacognitive Awareness Inventory (MAI) showed that because each is based on a unique theoretical framework, they measure different constructs. Differences between them are not solely due to the response formats or instructions given.

Another unique element of the MSLQ design is its focus on motivation and use of study strategies at the course level. That is, while the LASSI measured students’ use of study and learning strategies in college learning in
general, the MSLQ focused on the study strategies and motivation levels for a particular course. This was done intentionally based on the underlying assumptions that different learning strategies would be appropriate for different kinds of courses and reflects the theoretical understanding that constructs like self-efficacy and attribution are different depending on contextual variables such as the task at hand or the timing of an event (Garcia & Pintrich, 1995; Duncan & McKeachie, 2005).

Use of the MSLQ

Recognizing the effects of differing contexts also means that no norms can be created for the MSLQ because of differences in numerous variables such as instructor, assignments, and teaching methods between one classroom and another. Instructors, however, can develop norms for individual courses. After taking the MSLQ, a score profile can be generated and given to students along with suggestions for increasing their motivation and use of learning strategies (Pintrich et al., 1991). And a handbook for instructors providing teaching tips related to each MSLQ scale was published shortly after the instrument itself was introduced (Johnson et al., 1991). The instrument can be administered in its entirety in 20-30 minutes during a class session but the scales can also be used independently of one another (Duncan & McKeachie, 2005). The MSLQ is in the public domain and does not require permission of a publisher to be used. It has been translated into various languages and currently has both a college version
and a junior high/high school version. Online versions have also been created and it has been used by instructors in a variety of content areas, by staff of academic advising centers, by student development professionals, and by researchers.

Research using the MSLQ most often falls into one of four categories: instructional strategies, course structures, interventions, and educational technology (Duncan & McKeachie, 2005). First, the MSLQ has been used to compare and contrast the effectiveness of different instructional strategies. For example, Rittschoff and Griffin (2001) conducted a study of a cooperative learning technique called Reciprocal Peer Tutoring. They used the self-efficacy and test anxiety scales of the MSLQ to test the effectiveness of Reciprocal Peer Tutoring on increasing self-efficacy and lowering test anxiety.

Second, the MSLQ has advanced research on course structures such as the emphasis students perceive on particular kinds of achievement goals. For example, Karabenick (2004) studied student’s likelihood of seeking help in courses with an emphasis on performance goals versus courses emphasizing mastery or learning goals. In his study he used items from the MSLQ and adapted them to create an instrument to measure the constructs of help-seeking and goal orientation.

Third, because the MSLQ measures motivational beliefs and cognitive skills that affect academic performance, it is often used to determine the effects of interventions on particular populations of students. In a dissertation study, Ray
(2003) studied the impact of developmental programs on community college
student’s self-regulated learning using selected scales from the MSLQ.

And finally, as educational technology changes the shape of teaching and
learning for many students, the MSLQ is used to discover what effects
instructional delivery methods such as multimedia designs, Internet or
computer-based instruction might have on student learning. A study at the
Open University, an exclusively distance education institution in the United
Kingdom, for example, used the MSLQ to research the study behaviors of its
students (Richardson, 2007).

Many other examples could be given of the wide array of uses for the
MSLQ, but these uses would not be appropriate nor the conclusions of these
studies relevant if the MSLQ were not a valid and reliable instrument. The next
section will discuss evidence of the validity and reliability of the MSLQ.

Validity and Reliability of the Instrument

In order for the MSLQ to be a useful tool to accomplish the purpose of this
study, it must be both a valid and reliable instrument. To be valid, an
instrument must provide appropriate, useful and meaningful scores on which
the researcher can base inferences about an individual or group.

There are five sources of evidence of validity when collecting data by
means of a test or instrument (Gall, Borg, & Gall, 1996; Mertler, 2005). These are
construct validity, predictive validity, content validity, concurrent validity, and
consequential validity. The first two are most relevant to this study and will be discussed in relation to the MSLQ in the following paragraphs.

*Construct Validity through Correlation*

Construct validity “is the extent to which an instrument measures a characteristic that cannot be directly observed but must instead be inferred from patterns in people’s behavior (such a characteristic is a construct)” (p. 92, Leedy & Ormrod, 2005). Applied to the MSLQ, the constructs being measured are the names of the scales (see Table 4 earlier in this chapter). The Task Value of a particular course, for example, is a theoretical construct that cannot be directly observed. For this reason, items on the MSLQ have been designed in an attempt to measure it.

Establishing construct validity for the MSLQ would require evidence that the scale scores do indeed reflect, for example, the level of Extrinsic Goal Orientation or Test Anxiety possessed by a respondent to the questionnaire. Moreover, individual items on the questionnaire must be shown to be adequate measures of the constructs in question. That is, it must be shown how well the item that reads “I make lists of important terms for this course and memorize the lists” (Pintrich et. al, 1991, p. 19) does, as purported, relate to a student’s use of the learning strategy of Rehearsal.

One way to measure construct validity is to compare scale means to one another after an administration of the test to see if the relationships between the
scales matches the kind of relationship that would be expected based on the theory on which the instrument is based. For example, the theory underlying the concepts of self-efficacy and test anxiety would indicate that a student high in self-efficacy would be low in anxiety. It would be reasonable to expect that the higher the score in self-efficacy, the lower the score for test anxiety.

The comparison of the scale means takes the form of a correlation coefficient. A value of 1.0 would indicate a perfect relationship between the two scales, a value of 0.0 would indicate no relationship between the two scales, and a negative value would indicate an inverse relationship between the two scales. So, using the example posited above, the expected outcome when comparing the MSLQ’s Self-Efficacy for Learning and Performance scale with the Test Anxiety scale would be a negative value, indicating the expected inverse relationship.

Pintrich, Smith, Garcia, & McKeachie (1993) analyzed the MSLQ scales in this way. The study involved 380 students across thirty-seven classrooms, fourteen subjects, five disciplines, all grade levels and various ethnicities at a four year university and a community college. Table 5 shows the correlations among MSLQ scales (Pintrich et al., 1993).

Because the majority of these values are significant at the .05 level in the expected direction, they provide evidence for the construct validity of the scales (Gall, Borg & Gall, 1996). In other words, because the constructs interact with one another in the ways a theory-informed model would suggest that they would, it is much more likely that they do indeed measure those constructs.
Table 5
Correlations Among MSLQ Scales

<table>
<thead>
<tr>
<th></th>
<th>Intr</th>
<th>Extr</th>
<th>Taskv</th>
<th>Cont</th>
<th>Slfef</th>
<th>Tanx</th>
<th>Reh</th>
<th>Elab</th>
<th>Org</th>
<th>Crit</th>
<th>Mcg</th>
<th>Tsdy</th>
<th>Efft</th>
<th>Prln</th>
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<tr>
<td>Extr</td>
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<td></td>
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<tr>
<td>Taskv</td>
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<td>.18</td>
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<td>Cont</td>
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<tr>
<td>Slfef</td>
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<td>.51</td>
<td>.44</td>
<td></td>
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<td></td>
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<tr>
<td>Tanx</td>
<td>-.15</td>
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<td>-.14</td>
<td>-.10</td>
<td>-.37</td>
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<tr>
<td>Reh</td>
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<td>.44</td>
<td>.22</td>
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<td>.36</td>
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<tr>
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<td>.11</td>
<td>.47</td>
<td>.07</td>
<td>.44</td>
<td>-.21</td>
<td>.26</td>
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<td>.25</td>
<td>.61</td>
<td>.70</td>
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<tr>
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<td>.09</td>
<td>-.03</td>
<td>.05</td>
<td>.10</td>
<td>.21</td>
<td>.19</td>
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<td>.25</td>
<td>.15</td>
<td>.10</td>
<td>.05</td>
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<td>.22</td>
<td>.19</td>
<td>.25</td>
<td>.21</td>
<td>.18</td>
<td>.55</td>
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</tbody>
</table>

Note. Extr=Extrinsic Goal Orientation; Intr=Intrinsic Goal Orientation; Tskv=Task Value; Cont=Control of Learning Beliefs; Slfef=Self-Efficacy for Learning and Performance; Tanx=Test Anxiety; Reh=Rehearsal; Elab=Elaboration; Org=Organization; Crit=Critical Thinking; Mcg=Metacognitive Self-Regulation; Tsdy=Time & Study Environment Management; Efft=Effort Regulation; Prln=Peer Learning; Hsk=Help-Seeking. From A Manual for the Use of the Motivated Strategies for Learning Questionnaire, by P.R. Pintrich, D.A.F. Smith, T. Garcia, and W.J. McKeachie, 1991, p. 75. Copyright 1991 by The Regents of the University of Michigan. Reprinted with permission.

Specifically, the expected relationship between the Self-Efficacy for Learning and Performance scale and the Test Anxiety scale is present in a correlation coefficient of -.37. In fact, Test Anxiety has an inverse relationship with a majority of the other scales meaning that the lower the score in test anxiety, the higher the score in Intrinsic Goal Orientation, Control Beliefs about Learning, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation, Time & Study Environment, and Effort Regulation. These results are also consistent with the theory undergirding the instrument.

Several other notable relationships between scales lend support to the construct validity of the MSLQ. One of these is that Task Value shows a strong
relationship with Intrinsic Goal Orientation (.68) and Effort Regulation (.47). An understanding of motivation theory would lead one to expect that when a student valued the coursework, that student would be motivated by an internal desire to learn the material and would, subsequently, expend effort on mastering that material. Another correlation of interest is the weak relationship of Extrinsic Goal Orientation (<.20) with all of the scales except Test Anxiety (.23) and Rehearsal (.23). This is consistent with an expectation that the more a student is motivated by external rewards, the less that student would value the learning task for its own sake, attribute success to effort, and use more complicated learning strategies such as Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation, or Help-Seeking. Finally, the strongest relationship (.70) was found between Effort Regulation and Time & Study Environment. This would be consistent with an expected overlap between a student expending effort in a course and doing so by designating times and locations particularly conducive to study.

Construct Validity through Confirmatory Factor Analysis

In addition to comparing scale scores to one another to provide evidence of construct validity, a second way to provide such evidence is to use a procedure called confirmatory factor analysis. In this process, the individual items (called indicators) on the instrument are analyzed for the degree to which they fit or match a particular scale (called a latent variable). Before the
correlations are computed, an estimate (or parameter) is set for what the correlation coefficient will be. At this point, the correlations are computed.

Finally, a goodness-of-fit test is conducted to see how the parameters compare with the correlations. Using this procedure, if an item was found to match more than one scale or not consistently fit one scale, its ability to measure a particular construct would be cast into doubt. If, on the other hand, indicators are found to fall within the expected parameters, this fact serves as evidence of that item’s ability to measure the construct. In this way, confirmatory factor analysis serves as evidence of construct validity.

Two of these confirmatory factor analyses were conducted with the items in the MSLQ by the research team at NCRIPTAL (1993). One confirmatory factor analysis was conducted on the Motivation Scales and the other on the Learning Strategy Scales. The results were published in 1993 in Educational and Psychological Measurement. The outcome showed that the instrument truly was a quantitative representation of the theoretical model (Pintrich et al., 1993), therefore supporting its construct validity.

**Predictive Validity**

Additional evidence for the validity of an instrument can result from comparing later behavior to scores on the instrument and finding consistent patterns. That is, if a respondent’s current scores on the instrument correspond in a predictable way with future measured outcomes, the instrument can be said
to be measuring a present characteristic. This is referred to as predictive validity.

Evidence for the predictive validity of the MSLQ was collected in the 1990 study (Pintrich et al., 1993) using correlations between the scale scores and the students’ final grades in the course in which they were enrolled at the time the MSLQ was administered. Because the sample size in that study was 380 respondents, correlations at or exceeding .13 can be considered significant at the .05 level. Table 6 displays this data.

All of the Motivation Scales with the exception of Extrinsic Goal Orientation (.02) were significant predictors of final course grade (Pintrich et al., 1991; Pintrich et al., 1993). Among the nine Learning Strategies Scales, six were found to be predictive of final course grade except Rehearsal, Peer Learning and Help-Seeking. Thus, the MSLQ can be considered to have reasonably good predictive validity (Artino, 2005; Garcia & Pintrich, 1995).

Taken together, the evidence of construct validity and predictive validity make a strong case that the MSLQ is measuring the constructs it purports to measure. But an instrument must not only be valid but also consistent, or reliable, in doing so. Therefore, once an instrument is shown to be valid, it must also be analyzed for its reliability. To be reliable, an instrument must “yield consistent results when the characteristic being measured hasn’t changed” (Leedy & Ormrod, 2005, p. 93).
Table 6

Item Numbers, Internal Reliability Coefficients, and Correlations with Final Course Grade for MSLQ Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Items Comprising the Scale</th>
<th>Coefficient Alpha</th>
<th>Correlation with Final course Grade</th>
</tr>
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<tr>
<td><strong>MOTIVATION SCALES</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intrinsic Goal Orientation</td>
<td>1,16,22,24</td>
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<td>.25</td>
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<td>.62</td>
<td>.02</td>
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<td>Task Value</td>
<td>4,10,17,23,26,27</td>
<td>.90</td>
<td>.22</td>
</tr>
<tr>
<td>Control of Learning Beliefs</td>
<td>2,9,18,25</td>
<td>.68</td>
<td>.13</td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance</td>
<td>5,6,12,15,20,21,29,31</td>
<td>.93</td>
<td>.41</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>3,18,14,19,28</td>
<td>.80</td>
<td>-.27</td>
</tr>
<tr>
<td><strong>LEARNING STRATEGY SCALES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehearsal</td>
<td>39,46,59,72</td>
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<td>.05</td>
</tr>
<tr>
<td>Elaboration</td>
<td>53,62,64,67,69,81</td>
<td>.75</td>
<td>.05</td>
</tr>
<tr>
<td>Organization</td>
<td>32,42,49,63</td>
<td>.64</td>
<td>.17</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>38,47,51,66,71</td>
<td>.80</td>
<td>.15</td>
</tr>
<tr>
<td>Metacognitive Self-Regulation</td>
<td>33r,36,41,44,54,55,56,57r,61,</td>
<td>.79</td>
<td>.30</td>
</tr>
<tr>
<td>Time &amp; Study Environment</td>
<td>76, 78,79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort Regulation</td>
<td>37r,48,60r,74</td>
<td>.69</td>
<td>.32</td>
</tr>
<tr>
<td>Peer Learning</td>
<td>34,45,50</td>
<td>.76</td>
<td>-.06</td>
</tr>
<tr>
<td>Help Seeking</td>
<td>40r,58,68,75</td>
<td>.52</td>
<td>.02</td>
</tr>
</tbody>
</table>


**Reliability through Cronbach’s alpha**

One way of measuring reliability is to compute a statistic called Cronbach’s alpha (or coefficient alpha) for each scale, or construct. Cronbach’s alpha indicates the variability in how a participant responds to various items measuring the same construct. Because a participant would be expected to
respond similarly on different items measuring the same construct, the
coefficient alpha is a quantitative representation of the consistency in these
responses. The greater the value of the coefficient alpha, the more reliably that
construct is being measured. Similarly, the coefficient alpha provides evidence
in support of the validity of the instrument in question as well, because
consistent responses to items purportedly measuring the same construct also
provide evidence that a particular construct is being measured.

Coefficient alphas for each scale were computed by Pintrich, Smith,
Garcia, and McKeachie (1993) in the 1990 study. Again, the sample in that study
was 380 Midwestern college students spanning 37 classrooms, 14 subject
domains and 5 disciplines. The coefficient alphas are show in Table 6. While
they ranged from .52 for the Help-Seeking scale to .93 for the Self-Efficacy for
Learning and Performance, the fact that nine of the fifteen exceeded .70 indicates
that in general the scales are robust and the MSLQ can be considered to have
good internal reliability (Pintrich et al., 1993; Garcia & Pintrich, 1995; Artino,
2005).

Limitations of the MSLQ

Due to its validity and reliability and wide range of practical uses, the
MSLQ has helped to advance knowledge in the field of motivation for learning.
It does have limitations, however. The first of these comes from its status as a
self-report instrument. Self-report instruments are often criticized for measuring
the respondents’ opinions about why a certain event or process occurred, not necessarily measuring what did occur, and thereby call into question the validity of the measures. Garcia and Pintrich (1995) respond to this criticism by pointing to evidence that shows that a respondent’s report about a behavior that person has engaged in or an attitude that person has held has been shown to be accurate while abstractions and inferences have shown more distortion. Therefore, because the MSLQ items are reports of what learning strategies a student uses (behaviors) or beliefs a student holds (attitudes), this is an empty criticism.

Another threat to validity related to self-report instruments is social desirability bias. Duncan & McKeachie (2005) address this concern by stating that measures of response bias on their work with the MSLQ has not been related to any significant variance or impacted their results.

Duncan and McKeachie (2005) also respond to what may be perceived as a threat to reliability in the MSLQ. Because the instrument measures beliefs and strategies related to a specific course, the same student’s responses may well be different on the same items when related to different courses or contexts. Reliability is usually defined as the repeatability of a measure and the stability of a construct. But the theoretical framework on which the MSLQ is based assumes self-regulated learners will adapt their strategies and change their beliefs in different contexts. That is, a student might use rehearsal strategies regularly for learning biology terms but use critical thinking strategies more often for a literature class. Likewise, a student might have high self-efficacy for biology and
low self-efficacy for English. From this perspective, the lack of repeatability in results is not as much a threat to reliability as it is part of the design of the instrument. Even so, Duncan & McKeachie urge caution in interpreting self-report measures of motivation and learning strategies.

Another property of the MSLQ that can threaten internal reliability is the fact that in the factor analyses, somewhat different factor structures emerged from the junior high school questionnaire data than emerged in the college version of the questionnaire data. This too, however, fits with the conceptual model on which the MSLQ is based because the learning contexts of college students and junior high students are vastly different. Furthermore, because students can learn to learn, they should develop in their beliefs and strategies between junior high and college (Duncan & McKeachie, 2005).

At the conclusion of various statistical analyses, the MSLQ has been found to have good internal reliability and reasonable predictive validity. And despite its limitations, it has proven to be an “efficient, practical, and ecologically valid measure of students’ motivation and learning strategies” (Talbot, 1994, p.124; Duncan & McKeachie, 2005). Its strong rooting in theory makes it a valuable tool for measuring constructs with proven links to academic achievement and success.
Data Collection Procedures

This study is exploratory in nature using a cross-sectional survey design in which the Motivated Strategies for Learning Questionnaire was administered during the Fall 2010 and Spring 2011 semesters to freshmen and sophomores co-enrolled in sections of a course required of all students at a private, liberal arts institution in the Midwest.

For ease of data collection, demographic items, participant identification items and the 81 items of the MSLQ were entered in an online survey tool called Qualtrics. Free use of the website and its functions was negotiated with the company by the researcher in exchange for including the name of the program in the dissertation manuscript. The questionnaire could be accessed via a link sent to the respondent’s email address.

The first screen of the questionnaire (see Appendix A) served as the consent form. It provided the potential participant with information regarding risks and benefits of participation, procedures for ensuring anonymity, assurance of voluntary participation and the right to withdraw, and contact information should the student have any questions. The potential participant could progress beyond the first screen only after checking a box stating they had opportunity to read the information, understood their rights and were cooperating freely in the study.

The second screen asked for the student’s university ID number. This screen was placed at the beginning of the questionnaire as capturing this
information was crucial for the study. The ID number was used later in the study to link the participants’ scores with their high school GPAs, final course grades, and enrollment status.

Next was an instruction paragraph, introducing the purpose of the following section as gathering information about the participant’s motivation and attitudes and explaining the meaning of the points on the 7-point response scale. The 31 MSLQ Motivation Scale items followed. Another instruction section, introducing the purpose of the next section as gathering information regarding the participant’s learning strategies and skills proceeded the final 50 MSLQ Learning Strategies Scale items.

The following section included four demographic items. Participants were asked to provide their sex, race, high school graduation year and number of college credits completed. Finally, respondents were directed to enter their campus mailbox number and informed that this number would be entered into a drawing for a $75 cash prize as well as used to send them a report of their scores, accompanying study tips and a $1 coupon for the campus coffee shop. The student was also thanked for participating at this point.

The Qualtrics online survey tool captured the student responses and enabled the researcher to send follow-up or reminder emails only to those students who had not yet responded. Follow-up emails could also be sent to students who had started but not completed the questionnaire.
Before beginning data collection with university students, the researcher tested the Qualtrics program with six colleagues who agreed to receive the email link, respond to the items, and provide feedback about their experience. In this process, typographical errors were detected, wording was clarified in instruction sections, presentation was improved, and the researcher grew in confidence that the program could capture and retain the needed data. The pilot program respondents were rewarded with a $1 coupon to the campus coffee shop. The researcher then began the process of collecting data from the university students, the population of interest in the study.

The participants in this study were 93 freshmen and 109 sophomores co-enrolled in sections of History 180, a general education course at a private, Midwestern university. The History 180 course was chosen upon consultation with the staff of the Registrar’s Office at the university because it is the course with the largest enrollment that is fairly evenly balanced between freshmen and sophomores, the two groups of interest in this study. Because it was estimated based on past semesters that approximately 150 freshmen and 150 sophomores were enrolled in sections of this course during the Fall 2010 semester when the instrument was to be administered, it seemed most likely that the target number of 100 freshmen respondents and 100 sophomore respondents could be obtained by inviting students in the History 180 course to participate. Having both freshmen and sophomores co-enrolled in sections of the same course would also minimize the effect of the course itself on the outcome, enabling a better
comparison of sophomore and freshmen motivational and skill patterns. The
target return rate, considering the need for a sample size of 100 freshman and 100
sophomores for the questionnaire, became 65%.

However, for one reason or another, only 240 freshmen and sophomores
enrolled in the 9 sections History 180 in the Fall 2010 semester. This was fewer
than expected. The researcher received permission from faculty to visit 7 of the 9
sections to describe the benefits of participating and request student
participation face-to-face. Benefits of participation were a score report with
study tips being sent to the participant’s campus mailbox along with a $1 coupon
good at the campus coffee shop (see Appendix B). In addition, each participant’s
mailbox number was entered in a drawing for one of two $75 cash prizes. See
Appendix E to view the handout provided to each freshman and sophomore in
the course sections visited.

After each class visit, the researcher used the online survey tool Qualtrics
to email a link (see Appendix D) to an online version of the MSLQ (see Appendix
A) to each freshman and sophomore in that section. Email addresses for the 240
freshmen and sophomores enrolled in History 180 had been provided to the
researcher by the university Registrar’s Office upon the study receiving approval
from the Vice President for Academic Affairs at the university (see Appendix G).
Freshmen and sophomores and, inadvertently, one senior, in sections where the
faculty member did not allow the researcher to visit were also sent a similar
e-mail, inviting them to participate. Periodically during the next two to three
weeks, three email reminders (see Appendix D) were sent to those who had not yet responded. Score reports were generated by transferring data from the Qualtrics program into a Microsoft Excel spreadsheet, reversing the scores on the appropriate items (see Table 6), computing the scale scores and mail merging the scores into Microsoft Word documents. The score reports and coffee shop coupons were sent to respondents in three waves.

At the end of the Fall 2010 semester, 50 freshmen and 54 sophomores had chosen to participate and completed the questionnaire. Six students had partially completed the questionnaire. This fell short of the targeted 100 freshmen and 100 sophomores sample size needed to give adequate statistical power to the results. Therefore, data collection was extended into the Spring 2011 semester. The researcher held the drawing for one of the two $75 cash prizes at the end of the fall semester, reserving the second for the spring semester participants.

There were 202 freshmen and sophomores enrolled in 8 sections of History 180 in the Spring 2011 semester. The researcher visited 5 of the 8 sections to ask the freshmen and sophomores to participate in the study. The same procedures from the Fall 2010 semester were followed in the Spring 2011 semester to disseminate the survey, collect the data, generate score reports and thank those who participated. A drawing from the mailbox numbers of the spring semester participants was conducted and the $75 cash prize awarded.
Of the 202 freshmen and sophomores enrolled in History 180, 98 students responded when the questionnaire was sent to them. These 98 student responses were added to the 104 complete responses and six partial responses from the fall semester. Table 7 provides information concerning the questionnaire distribution and response rates. The overall response rate for both semesters

Table 7

Questionnaire Respondents and Response Rate

<table>
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<tr>
<th>Section of HIST 180</th>
<th>Questionnaire Links mailed</th>
<th>Questionnaires Started</th>
<th>Questionnaires Finished</th>
<th>Class Visit to Encourage Participation</th>
<th>Response Rate (%)</th>
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</tr>
<tr>
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<td>32</td>
<td>10</td>
<td>5</td>
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<td>15.6</td>
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<td>B</td>
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<td>20</td>
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<tr>
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<tr>
<td>D</td>
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<td>3</td>
<td>2</td>
<td>No</td>
<td>15.4</td>
</tr>
<tr>
<td>J</td>
<td>36</td>
<td>23</td>
<td>17</td>
<td>Yes</td>
<td>47.2</td>
</tr>
<tr>
<td>K</td>
<td>17</td>
<td>8</td>
<td>7</td>
<td>Yes</td>
<td>41.2</td>
</tr>
<tr>
<td>Spring 2011 Sections</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>16</td>
<td>12</td>
<td>11</td>
<td>Yes</td>
<td>68.8</td>
</tr>
<tr>
<td>B2</td>
<td>20</td>
<td>7</td>
<td>5</td>
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<td>25.0</td>
</tr>
<tr>
<td>C2</td>
<td>42</td>
<td>25</td>
<td>21</td>
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</tr>
<tr>
<td>D2</td>
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<td>20</td>
<td>18</td>
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</tr>
<tr>
<td>E2</td>
<td>11</td>
<td>3</td>
<td>2</td>
<td>No</td>
<td>18.2</td>
</tr>
<tr>
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<td>24</td>
<td>10</td>
<td>8</td>
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</tr>
<tr>
<td>G2</td>
<td>37</td>
<td>12</td>
<td>10</td>
<td>No</td>
<td>27.0</td>
</tr>
<tr>
<td>I2**</td>
<td>17</td>
<td>17</td>
<td>16</td>
<td>Yes</td>
<td>94.1</td>
</tr>
<tr>
<td>All 17 Sections</td>
<td>442</td>
<td>234</td>
<td>195</td>
<td></td>
<td>44.1</td>
</tr>
</tbody>
</table>

Note. * = there was no Section E or F offered; ** = Section H2 was an Honors College section
was 44.1%. The data was organized in a Microsoft Excel spreadsheet in preparation for analysis.

Other data remaining to be collected for the purpose of this study included participants’ high school grade point average (GPA), final course grade, and retention status in the following semester. This data was obtained through the university’s Office of Institutional Research. High school GPAs could be obtained immediately. Final course grades were obtained after the semester had ended and faculty had posted final grades. Enrollment status was obtained for the Fall 2010 in the early weeks of the Spring 2011 semester. Enrollment status information was not pursued for the Spring 2011 group for reasons that will be explained in Chapter 4.

For the purpose of controlling for the variance created by students’ prior achievement, high school grade point averages for students participating in the study were obtained from the Office of Institutional Research and used in analysis. High school GPA was chosen over standardized test scores for this purpose because the high school GPA is a measure of student’s achievement that encompasses both cognitive (mastery of material) and non-cognitive (e.g. attendance, class participation) aspects of the student’s prior learning experiences (Noble & Sawyer, 2004) and has been found to be more predictive of college success than scores on standardized tests such as the ACT or SAT (Geiser & Santelices, 2007).
Confidentiality of all student data was maintained by using only an assigned identification number for each participant rather than names during the time the data was being collected and analyzed. Score reports and incentives were sent to the campus mailbox number provided by the participant and only the two winners of the $75 cash prizes needed to reveal their names to claim their prize and provide documentation for the expenditure of research grant money.

Upon submission of a proposal, this study was deemed exempt from full review by the Institutional Review Board at the university where the study was conducted (see Appendix H). These procedures were followed in order to collect the data needed to address the research questions, maximize the questionnaire return rate, minimize risk to the participants, and maintain the integrity of the study.

Mertler & Vannatta (2005) state the necessity of considering how data will be used before it is collected. The next section seeks to provide a description of the methods and procedures that were planned and later used for data analysis.

Data Analysis Methods and Procedures

Once data is collected, it must be analyzed in light of the research questions and hypotheses posed for the study using appropriate statistical methods. Table 8 summarizes the measures and methods that were used to examine the data in response to each research question as well as the relevant
variables for use with that method. The information in the table is discussed in more detail in subsequent sections.

Table 8

Data Analysis Methods for Current Study

<table>
<thead>
<tr>
<th>Question</th>
<th>Statistical Measures Used</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research Question 1:</strong> What pattern(s) of motivation and what use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?</td>
<td><em>Descriptive Statistics:</em> Mean for each scale, variance, standard deviation, standard error of measure</td>
<td>15 MSLQ scale scores; Class level</td>
</tr>
<tr>
<td><strong>Research Question 2:</strong> After controlling for prior achievement as measured by high school grade point average (GPA), what similarities and differences in the patterns of motivation and use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?</td>
<td><em>Inferential Statistics:</em> MANOVA-compare means; MANCOVA--compare means while controlling for another variable</td>
<td>Independent: Class Level; Dependent: means for each MSLQ scale; Covariate: high school GPA</td>
</tr>
<tr>
<td><strong>Research Question 3:</strong> Is there a significant relationship between motivation or use of learning strategies and student achievement as measured by final course grade?</td>
<td><em>Inferential Statistics:</em> Pearson r Correlation Coefficients; Multiple regression</td>
<td>Independent: high school GPA, means for MSLQ scales; Dependent: final course grade</td>
</tr>
<tr>
<td><strong>Research Question 4:</strong> Are MSLQ subscale scores significant predictors of college student retention/persistence?</td>
<td><em>Inferential Statistics:</em> Logistic regression</td>
<td>Independent: Means for MSLQ scales; Dependent: persistence (yes/no)</td>
</tr>
</tbody>
</table>
The data collected in the current study was organized using an Excel spreadsheet in the form of a data matrix, where rows represent the research participants and columns the variables of interest in this study. The variables relevant to this study include responses to demographic questions from each participant, responses to each item on the MSLQ, the class level of each participant, the high school grade point average of each participant, the final course grade for each participant, and the enrollment status of participants in the subsequent semester.

Descriptive Statistics

The responses to demographic questions were counted and converted to percentages in order to provide a description of the participants for the study. Additionally, these percentages provided information concerning the generalizability of the study.

Multivariate Analysis of Variance (MANCOVA)

The MSLQ item responses were converted to scale scores for each participant. The mean scale scores and standard deviation was then computed for the group of freshman respondents and the group of sophomore respondents. The mean scale scores for the two groups were then compared using a procedure called multivariate analysis of covariance (MANCOVA). This method is used in
analyzing the difference between groups based on multiple dependent variables while controlling for another variable, called the covariate.

MANCOVA allows the researcher to understand whether any difference between the groups is due to a variable, called the covariate, that would be expected to affect the dependent variables. In the current case, it is reasonable to expect that participants with a higher level of achievement in high school would also have higher levels of motivation and would be more likely to employ learning strategies in college. For this study, measure of achievement in high school was the high school GPA. The measures of six motivational constructs and use of nine learning strategies were the MSLQ scale score means. The covariate was high school GPA. The advantage of using multivariate statistics in this study is that “the researcher is able to obtain a more complete and detailed description of the phenomenon under investigation” (Mertler & Vannatta, 2005, p.2). In summary, using MANCOVA enabled an examination of how the two groups compare in motivation and use of learning strategies regardless of their level of past achievement in high school.

Product-Moment Correlation Coefficients

To discover the relationship of participants’ scale scores with their final course grades, product-moment correlations coefficients (or Pearson r) was used. Pearson r is a bivariate statistic appropriate for use when both variables under consideration can be expressed numerically as ratios. An advantage of this
technique is its small standard error (Gall, Borg & Gall, 1996). This statistical method shows how the two variables are related to one another. The closer the $r$ is to 1 or -1, the stronger the relationship between the variables and the stronger the degree to which one variable can be said to predict the other. Because the final course grade and scale score can be expressed on a continuous scale (as ratios), Pearson $r$ enabled the researcher to address the question of the extent to which MSLQ scale scores were related to course grades. The current study sought to replicate results of other studies discussed earlier in which MSLQ scale scores, particularly the Self-Efficacy for Learning and Performance scale (.41) showed a significant relationship to grades in a variety of courses in other disciplines.

**Multiple Regression**

Because multiple variables were being examined for their relationship with the final course grade, a method called multiple regression was used. Multiple regression produces $r$ squared values for several variables. These $r$ squared values indicate how much of a dependent variable can be explained by groups of independent variables, or models. Multiple regression also yields statistics called beta coefficients that allow the researcher to discover the relative value of each independent variable in explaining the dependent variable. In the current study, multiple regression allowed the researcher to examine the
magnitude of all fifteen MSLQ scale scores correlation to final course grades and identify those scales that were most influential on final course grades.

*Logistic Regression*

Logistic regression is a technique that allows the researcher to predict the probability of a particular dichotomous outcome based on multiple independent variables (Hosmer & Lemeshow, 2000). This technique was used in this study to address the question of whether and to what degree MSLQ scores serve as a predictor of college student persistence or attrition.

The researcher applied these statistical methods to the collected data with the goal of testing the hypotheses, addressing the research questions, and accomplishing the purpose of the study.

Overall Quality of Research Design

The ability of this study to achieve these goals, however, is dependent on the internal and external validity of the study. The internal validity of a study reflects the ability of its design and the data collected in conducting it to lead to meaningful, accurate, and credible conclusions. The external validity of a study reflects the extent to which the results can be applied to other contexts or generalized to other groups of people (Leedy & Ormrod, 2005).

There are several evident threats to validity in the current study. The first of these is the selection of participants. Participation in the study was voluntary
and a convenience sample at a private, Midwestern university where most ethnic minorities are under-represented was used. Therefore, the results may not be generalizable to other populations in the same way they would be if a random and representative sample was used.

Second, because of the high retention rate of the university where the research was conducted, it was recognized that there might be only a very small group of students who did not return to the university. This turned out to be the case, making it impossible to draw any conclusions about the final research question. Moreover, when students did leave the university, there was no way of knowing if they transferred to another institution to continue their studies and progress toward a degree elsewhere or left higher education altogether.

Third, while all participants were enrolled in the same course with the same curriculum, they were enrolled in different sections of the course with different instructors and assignments. This may affect their motivation levels, choice of study strategies and final course grade.

Fourth, the descriptive design precluded determining cause and effect. Care needed to be taken to ensure that inferences were justified by the statistics. In the current study, this meant that while the scores for the freshman group and the scores of the sophomore group could be compared in order to discover if differences exist between the groups, claims could not be made about the causes for these differences.
Summary

The goal of this chapter was to describe the methodological aspects of the current study. A cross-sectional survey design was used to investigate and compare the motivation for learning and the use of learning strategies of college freshmen and sophomores. Employing a recognized and widely used instrument called the Motivation Strategies for Learning Questionnaire for data collection, the researcher analyzed the collected data using appropriate statistical tests and measures to discover the relationship of motivation and use of learning strategies to student achievement in a History course. The results of this analysis are presented in Chapter IV.
CHAPTER IV

RESULTS

Introduction

The previous chapter described the procedures and instruments used to collect the data and the computations and statistical tests used to analyze the data. This chapter provides a report of the results of those computations and tests. First, information concerning the questionnaire response rate is reviewed. Second, the frequencies of various demographic characteristics are reported as a description of the sample. Next, results providing evidence related to each of the four research questions and hypotheses are presented. In addition to being described in the text, these results will also be presented in table form as often as possible for the benefit of the reader. The chapter ends with a summary of the major findings from this study.

Response Rate

Through the data collection process 442 students were sent a link to the online questionnaire and asked to participate in the study. Of those invited, 234 students started to respond to the questionnaire and 195 completed the
questionnaire for an overall 44.1% response rate (see Chapter 3, Table 7). The questionnaire was emailed only to freshmen and sophomores enrolled in traditional sections of History 180 with the exception of one senior who was sent a questionnaire due to oversight on the part of the researcher. Of the 39 students who started but did not complete the questionnaire, 9 had responded to a sufficient number of items or the researcher was able to access missing data using the provided ID number in order to include them in the sample for all or some tests. For this reason, as results are reported in the following sections, the total number of respondents may range from 195 to 203.

Description of the Sample

The final four items on the questionnaire asked respondents to report their high school graduation year, number of completed college credits, race and sex. Response frequencies are displayed in Table 9. Eighty-eight (43.3%) of the participants graduated from high school in 2010; 94 (46.3%) graduated in 2009; 9 (4.4%) graduated in 2008; 1 (.5 %) graduated in 2007; 4 (2%) graduated before 2007 and 1 (.5%) had not yet graduated. Because the questionnaire was administered during the 2010-2011 academic year, the sample can be characterized as comprising a majority of traditional-aged college students, who entered college in the same year they graduated from high school.

As expected of a questionnaire administered to students identified by the university Registrar’s Office as freshmen and sophomores, 93 (45.8%) of the
respondents had completed 0-28 college credits (freshmen status) and 109 (53.7%) had completed between 29 and 59 credits (sophomore status). Only 1 respondent (.5%) reported completing over 90 college credits. This respondent was a senior who was inadvertently sent a questionnaire.

Table 9

Frequency Distribution of Participants’ Demographic Characteristics

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year of H.S. graduation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>88</td>
<td>43.3</td>
</tr>
<tr>
<td>2009</td>
<td>94</td>
<td>46.3</td>
</tr>
<tr>
<td>2008</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td>2007</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Before 2007</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Not yet graduated</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Not reported</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Number of college credits completed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-28</td>
<td>93</td>
<td>45.8</td>
</tr>
<tr>
<td>29-59</td>
<td>109</td>
<td>53.7</td>
</tr>
<tr>
<td>90+</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American/Black</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>190</td>
<td>93.6</td>
</tr>
<tr>
<td>Latino/Latina</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Multiracial</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Not reported</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>134</td>
<td>66.0</td>
</tr>
<tr>
<td>Male</td>
<td>63</td>
<td>31.0</td>
</tr>
<tr>
<td>Unreported</td>
<td>6</td>
<td>3.0</td>
</tr>
</tbody>
</table>

The frequencies reported in the categories of race and sex are reflective of the student population at the university where the questionnaire was
administered. A majority, 190 respondents (93.6%), reported their race as Caucasian/White. One (.5%) reported his or her race as African-American/Black; 3 (1.5%) as Asian; 1 (.5%) as Latino/Latina; 2 (1%) as Multiracial; and 6 (3.0%) did not respond. Also reflecting the male to female ratio at the university, 134 (66%) of respondents reported their sex as female while 63 (31%) reported their sex as male and 6 (3%) did not respond.

In summary, the sample consisted mostly of 2009 and 2010 high school graduates, almost exclusively university freshmen and sophomores, two-thirds female, of whom a majority describe themselves as Caucasian/White. The data collected from this sample was used to respond to the research questions and test the hypotheses defined for this study.

Research Question 1

A report of results for this study begins with those results pertaining to Research Question 1 which is restated below.

Research Question 1: What pattern(s) of motivation and what use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

Because this study was exploratory in nature, there was no research hypothesis associated with this question. To explore the question, however, descriptive statistics for the class level groups were calculated using Statistical Package for the Social Sciences (SPSS), Version 19.0. These results are displayed in Table 10.
Each student involved in the research study provided responses to each item on a 1-7 scale, indicating how much the item described him or her. After data collection, the value was reversed for items that were worded negatively. In keeping with the scoring procedures outlined in the MSLQ Manual (Pintrich, Smith, Garcia, and McKeachie, 1991), the responses to the items that fell into each scale were averaged for a mean score for each respondent. Then the average of all freshmen scores and all sophomore scores was computed for each scale. These are the mean scores displayed in Table 10.

For this reason, the highest possible score would be a 7 while the lowest possible score would be a 1. In general, a higher score is better than a lower score because it indicates a higher level of a particular motivational construct or more use of a learning strategy. The exception to this is the Text Anxiety scale where a higher score indicates a higher level of nervousness and worry when taking tests or quizzes which generally inhibits student performance. While the instrument is not normed, the sample feedback form provided in the MSLQ manual states that if a respondent falls below a score of 3 on more than six of the scales, that student should seek assistance from the instructor or institution’s counseling services (Pintrich et al., 1991).

Some patterns do emerge from an analysis of the means scores. In both groups, the mean for Extrinsic Goal Orientation is higher than the mean for Intrinsic Goal Orientation meaning that in general, respondents reported feeling
more motivated by external rewards such as grades, competition and evaluations from others than by challenge, curiosity or mastery.

Table 10

Descriptive Statistics for MSLQ scales by Class Level

<table>
<thead>
<tr>
<th>MSLQ scale</th>
<th>Freshmen (n=92)</th>
<th>Sophomores (n=107)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Goal Orientation</td>
<td>4.136</td>
<td>4.183</td>
</tr>
<tr>
<td>Extrinsic Goal Orientation</td>
<td>5.031</td>
<td>5.302</td>
</tr>
<tr>
<td>Task Value</td>
<td>4.142</td>
<td>4.164</td>
</tr>
<tr>
<td>Control of Learning Beliefs</td>
<td>5.145</td>
<td>5.030</td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance</td>
<td>4.873</td>
<td>4.934</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>3.639</td>
<td>3.880</td>
</tr>
<tr>
<td>Rehearsal</td>
<td>4.123</td>
<td>4.066</td>
</tr>
<tr>
<td>Elaboration</td>
<td>4.258</td>
<td>4.183</td>
</tr>
<tr>
<td>Organization</td>
<td>3.607</td>
<td>3.730</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>3.463</td>
<td>3.400</td>
</tr>
<tr>
<td>Metacognitive Self-Regulation</td>
<td>3.730</td>
<td>3.782</td>
</tr>
<tr>
<td>Time &amp; Study Environment</td>
<td>4.873</td>
<td>4.732</td>
</tr>
<tr>
<td>Effort Regulation</td>
<td>4.990</td>
<td>4.754</td>
</tr>
<tr>
<td>Peer Learning</td>
<td>2.971</td>
<td>2.756</td>
</tr>
<tr>
<td>Help-Seeking</td>
<td>3.620</td>
<td>3.300</td>
</tr>
</tbody>
</table>

The mean Test Anxiety score was above 3.5 for both groups, showing that when taking a test the students in the sample often experience uneasy feelings and fast heart rates and think about the items they can’t answer, the
consequences of failing, and how poorly they are doing in comparison with others while taking an exam or test. These means reflect a very high level experienced by several respondents, a moderate level experienced by most, or a combination of the two. What is not a possibility, however, is that a majority of students report low levels of test anxiety.

The highest mean score for both groups was on the Control of Learning Beliefs scale. This means that, in general, student respondents report a high level of belief in outcomes being contingent on their efforts in the course. Higher scores here tend to translate into studying more strategically and effectively (Pintrich et al., 1991).

Another high mean score for both groups was the score for Self-Efficacy for Learning and Performance. This means the respondents, in general, appraise themselves quite highly in their ability to master the course content and do well in the course.

On the nine Learning Strategies Scales, both groups have a low mean score for Peer Learning. This means a majority of the respondents did not find the items concerning collaboration and dialogue with peers in the learning process to describe them well. In other words, the respondents on average are not likely to use study groups or work with others to complete assignments.

According to these results, the students in the sample tend to rely more heavily on the strategies of Effort Regulation and management of their Time and Study Environment and less on the strategies of Critical Thinking and
Organization. That is, their responses show that they think themselves more likely to persevere in their studies when bored or the work is difficult and to set aside time and space to study than to apply previous knowledge to new situations or construct connections between the concepts to be learned.

Two of the higher means scores among the Learning Strategies scales scores are for Rehearsal and Elaboration. For both groups, Elaboration scores are higher than Rehearsal scores. This means that respondents report paraphrasing, summarizing, and creating analogies—strategies that can help them store information in long-term memory—more often than merely repeating the information to themselves, listing terms and seeking to store key words in their working memory. Elaboration is considered a deeper level of learning in comparison with Rehearsal which is considered surface-level learning.

Two mean scores in the mid-range for both groups were Help-Seeking and Metacognitive Self-Regulation. This means respondents were moderately likely to describe themselves as someone who would seek out learning assistance from peers and instructors or to plan, monitor, and adapt their learning activities as needed to achieve in the course.

On average, sophomores scored higher than freshmen on five of the six Motivation Scales: Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Self-Efficacy for Learning and Performance and Test Anxiety (see Table 10). Only on the Control of Learning Beliefs scale did freshmen score higher than sophomores. Freshmen scored higher on average than sophomores on seven of
the nine Learning Strategies scales: Rehearsal, Elaboration, Critical Thinking, Time and Study Environment, Effort Regulation, Peer Learning, and Help-Seeking. Sophomores scored higher than freshmen on the scales of Organization and Metacognitive Self-Regulation. But before any meaning can be attached to these results, further analysis was needed to discover if any of these differences were significant. This was done by using a statistical test called MANCOVA (Multivariate Analysis of Covariance) when considering Research Question 2.

Research Question 2

Research Question 2 and its corresponding research hypothesis are restated below:

Research Question 2: After controlling for prior achievement as measured by high school grade point average (GPA), what similarities and differences in the patterns of motivation and use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

Research Hypothesis: Controlling for high school GPA, sophomore scores on MSLQ scales will differ significantly from those of freshmen in the study.

To test this hypothesis, multivariate analysis of covariance (MANCOVA) was utilized to examine the effect of class level on MSLQ scales, controlling for high school GPA. In other words, the MSLQ scale means for freshmen were compared to the MSLQ scale means for sophomores in order to determine whether class level influenced their scores. This was done with no assumptions about whether the freshmen mean scores would be higher or lower than the
sophomore mean scores. Moreover, the participants’ high school GPAs were included in the calculations in order to ensure that any differences found were not due to prior academic performance in high school. That is to say, it would be logical to assume that students who had done well in high school would already be more motivated or more likely to use particular learning strategies. So, it would seem, a participant’s MSLQ scale scores would be higher if they had a higher high school GPA and both scores would vary together. Thus, high school GPA is called a covariate. Because the goal of this research question was to discover if these differences in MSLQ scale means resulted from class level rather than past academic achievements, this could be done more readily by using MANCOVA, removing the influence of the covariate, high school GPA, and more clearly measuring the influence of class level. In MANCOVA the means are adjusted to control for the covariate, which in this study is high school GPA. Table 11 shows the unadjusted and adjusted mean scores for freshmen and sophomores on each of the 15 MSLQ scales.

Before the MANCOVA was performed, a significance level of .05 was established. This means that in order for differences between the freshman and sophomore groups to be considered significant, the p-value needed to be .05 or lower. This translates into a 95% probability of avoiding both the error of failing to reject the null hypothesis when it true and the error of rejecting the null hypothesis when it is not true.
When the adjusted means for freshmen and sophomores were analyzed, a significant difference was found between the two groups for three of the MSLQ Motivation Scales: Control of Learning Beliefs, Self-Efficacy for Learning and Performance, and Test Anxiety. No significance can be attached to differences in means for other scales.

Table 11

Adjusted and Unadjusted Means for Freshmen and Sophomores

<table>
<thead>
<tr>
<th>MSLQ Scale</th>
<th>Freshmen (n=92)</th>
<th>Sophomores (n=107)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted Mean</td>
<td>Unadjusted Mean</td>
</tr>
<tr>
<td>Intrinsic Goal Orientation</td>
<td>4.133</td>
<td>4.136</td>
</tr>
<tr>
<td>Extrinsic Goal Orientation</td>
<td>5.034</td>
<td>5.031</td>
</tr>
<tr>
<td>Task Value</td>
<td>4.147</td>
<td>4.142</td>
</tr>
<tr>
<td>Control of Learning Beliefs</td>
<td>5.156*</td>
<td>5.145</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>3.625*</td>
<td>3.639</td>
</tr>
<tr>
<td>Rehearsal</td>
<td>4.119</td>
<td>4.123</td>
</tr>
<tr>
<td>Elaboration</td>
<td>4.248</td>
<td>4.258</td>
</tr>
<tr>
<td>Organization</td>
<td>3.604</td>
<td>3.607</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>3.457</td>
<td>3.463</td>
</tr>
<tr>
<td>Metacognitive Self-Regulation</td>
<td>3.729</td>
<td>3.730</td>
</tr>
<tr>
<td>Time &amp; Study Environment</td>
<td>4.872</td>
<td>4.873</td>
</tr>
<tr>
<td>Effort Regulation</td>
<td>4.989</td>
<td>4.990</td>
</tr>
<tr>
<td>Peer Learning</td>
<td>2.964</td>
<td>2.971</td>
</tr>
<tr>
<td>Help-Seeking</td>
<td>3.619</td>
<td>3.620</td>
</tr>
</tbody>
</table>

*p<.05.
It is important not only to know that there is a significant difference but also to understand the direction of the difference; in other words, whether the freshmen reported more or less test anxiety, self-efficacy, or belief that success or failure was under their control than the sophomores. The significantly higher mean for the freshman group (5.156) over the sophomore group (5.020) in Control of Learning Beliefs means that freshmen were significantly more likely than sophomores to report viewing their success or failure in a course as under their control. However, the significantly higher mean for sophomores (4.923) on the Self-Efficacy for Learning and Performance scale means that sophomores were more likely than freshmen (4.886) to report confidence in their ability to learn and perform well in a course. On the other hand, the significantly higher mean for sophomores (3.893) over freshmen (3.625) on the Test Anxiety scale indicates that sophomores were also more likely to report experiencing symptoms of anxiety while taking tests.

But equally important as the direction of the difference is the size of the difference. Although differences on these three scales were found to be statistically significant, effect size helps the researcher to interpret the practical significance of the differences (Gall, Borg, & Gall, 1996). Table 12 shows the effect sizes calculated for the differences between the freshmen and sophomore means on the three MSLQ scales where a significant difference was found.

Effect size represents numerically the difference between the two groups in relation to a normal curve. An effect size of .2 would represent a difference
between the groups of one-fifth of a standard deviation. This is considered a small effect size. Because the effect sizes found here are lower than .2, they are considered very small. So while there is a difference between freshmen and sophomores on these three scales and the probability of that difference occurring by chance is less than 5%, the differences themselves are small differences.

Table 12

Effect Sizes of Significant Differences between Freshmen and Sophomores

<table>
<thead>
<tr>
<th>MSLQ Scale</th>
<th>Freshmen (n=92)</th>
<th>Sophomores (n=107)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Effect size</td>
</tr>
<tr>
<td>Control of Learning Beliefs</td>
<td>5.156</td>
<td>1.114</td>
<td>5.020</td>
<td>.970</td>
<td>.130</td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance</td>
<td>4.886</td>
<td>1.123</td>
<td>4.923</td>
<td>1.044</td>
<td>-.034</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>3.625</td>
<td>1.381</td>
<td>3.893</td>
<td>1.537</td>
<td>-.183</td>
</tr>
</tbody>
</table>

In summary, small but significant differences were found between freshmen and sophomores on three of 15 MSLQ subscales when controlling for GPA. The relationship between the MSLQ subscale scores and performance in the course as measured by course grade was analyzed next when considering Research Question 3.
Research Question 3

Research Question 3 and its corresponding research hypothesis are restated below:

Research Question 3: Is there a significant relationship between motivation or use of learning strategies and student achievement as measured by final course grade?

Research Hypothesis: There is a significant relationship between MSLQ scale scores and student achievement in the course as measured by final course grade.

As the first step in investigating this question, the scores of respondents who had withdrawn from the course, and therefore did not have a final course grade, were removed from the data set. Then, two types of statistics were computed for both the MSLQ Motivation scales and MSLQ Learning Strategy scales. First, Pearson correlation coefficients, showing the relationship of the mean MSLQ scale score and the final course grade, the relationship of the mean MSLQ scale score and high school GPA, and the relationship of the scale scores to one another, were calculated using SPSS, Version 19.0 (see Tables 13 and 14).

Table 13 shows several significant relationships between final course grade and the Motivation Scales. In fact, there is a significant correlation between four of the six Motivation Scales (all except Extrinsic and Intrinsic Goal Orientation) and the Final Course Grade. Additionally, there is a significant correlation between high school GPA and Final Course Grade. However, none of these correlations is a strong correlation. Correlations are considered strong
Table 13

Correlations between MSLQ Motivation Scales and Final Course Grade (n=197)

<table>
<thead>
<tr>
<th></th>
<th>Final Course Grade</th>
<th>Intrinsic Goal Orientation (INTR)</th>
<th>Extrinsic Goal Orientation (EXTR)</th>
<th>Task Value (TV)</th>
<th>Control of Learning Beliefs (CONT)</th>
<th>Self-Efficacy for Learning &amp; Performance (SE)</th>
<th>Test Anxiety (TA)</th>
<th>High School GPA (HSGPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Course Grade</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrinsic Goal Orientation (INTR)</td>
<td></td>
<td>.128</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrinsic Goal Orientation (EXTR)</td>
<td></td>
<td>.103</td>
<td>.174*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task Value (TV)</td>
<td>.215*</td>
<td>.726*</td>
<td>.219*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of Learning Beliefs (CONT)</td>
<td></td>
<td>.230*</td>
<td>.347*</td>
<td>.180*</td>
<td>.388*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance (SE)</td>
<td></td>
<td>.409*</td>
<td>.385*</td>
<td>.228*</td>
<td>.341*</td>
<td>.565*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Anxiety (TA)</td>
<td>-.302*</td>
<td>.033</td>
<td>.256*</td>
<td>-.023</td>
<td>-.091</td>
<td>-.247*</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>High School GPA (HSGPA)</td>
<td>.420*</td>
<td>-.027</td>
<td>.008</td>
<td>.032</td>
<td>.145*</td>
<td>.138</td>
<td>-.163*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

when they exceed a value of .7, moderate when they fall between .3 and .7 and weak when they fall below .3 (Cronk, 2008). Therefore, there are no strong correlations between Motivation Scales and Final Course Grade. The correlations between Final Course Grade and Self-Efficacy for Learning & Performance (.409) and Test Anxiety (-.302) are moderately strong. The correlations of Final Course Grade with Task Value (.215) and with Control of Learning Beliefs (.230), while significant, are weak. However, the correlation between Final Course Grade and high school GPA (.420) is moderately strong and also the strongest of the correlations examined in this study.

Table 14 shows the correlations of Final Course Grade and the Learning Strategies Scales as well as correlations of Learning Strategies Scales with one
another. All correlations of Final Course Grade and the Learning Strategies Scales are very weak and none are significant.

Table 14

Correlations between Learning Strategies Scales and Final Course Grade (n=197)

<table>
<thead>
<tr>
<th></th>
<th>Final Course Grade</th>
<th>Rehearsal (RH)</th>
<th>Elaboration (EL)</th>
<th>Organization (OR)</th>
<th>Critical Thinking (CRIT)</th>
<th>Metacognitive Self-Regulation (MS)</th>
<th>Time &amp; Study Environment (TS)</th>
<th>Effort Regulation (ER)</th>
<th>Peer Learning (PRLRN)</th>
<th>Help-Seeking (HSK)</th>
<th>High School GPA (HSGPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Course Grade</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehearsal (RH)</td>
<td>-.119</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration (EL)</td>
<td>-.059</td>
<td>.609</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization (OR)</td>
<td>-.079</td>
<td>.713</td>
<td>.580*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Thinking (CRIT)</td>
<td>-.025</td>
<td>.401*</td>
<td>.658*</td>
<td>.438*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metacognitive Self-Regulation (MS)</td>
<td>-.045</td>
<td>.638*</td>
<td>.745*</td>
<td>.695*</td>
<td>.728*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time &amp; Study Environment (TS)</td>
<td>.093</td>
<td>.589*</td>
<td>.599*</td>
<td>.581*</td>
<td>.405*</td>
<td>.665*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort Regulation (ER)</td>
<td>.039</td>
<td>.495*</td>
<td>.591*</td>
<td>.428*</td>
<td>.353*</td>
<td>.564*</td>
<td>.772*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Learning (PRLRN)</td>
<td>-.093</td>
<td>.422*</td>
<td>.386*</td>
<td>.486*</td>
<td>.434*</td>
<td>.600*</td>
<td>.293*</td>
<td>.239*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help-Seeking (HSK)</td>
<td>-.001</td>
<td>.294*</td>
<td>.350*</td>
<td>.324*</td>
<td>.357*</td>
<td>.513*</td>
<td>.333*</td>
<td>.296*</td>
<td>.695*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>High School GPA (HSGPA)</td>
<td>.420*</td>
<td>-.028</td>
<td>-.112</td>
<td>.020</td>
<td>.070</td>
<td>.015</td>
<td>.007</td>
<td>-.001</td>
<td>-.064</td>
<td>-.001</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

The second statistical procedure employed to examine the relationship of MSLQ scales and final course grade was Multiple Regression. Multiple Regression as a statistical method analyzes to what extent variables predict an outcome, in this case to what extent the MSLQ scales and high school GPA predict a course grade. The groupings of variables in multiple regression analyses are referred to as models and statistics are generated that together tell the researcher whether and how well a particular model explains a particular
outcome, in this case which grouping of MSLQ scale scores best explains a final course grade.

The variables included in the Multiple Regression analyses were the MSLQ scale score means and high school GPA as independent variables and the final course grade as the dependent variable. The Multiple Regression procedure was completed twice, once for the Motivation scales and once for the Learning Strategy scales.

There are several kinds of regression analyses that can be done. A variation of statistical multiple regression, called backward deletion, is used here. This is appropriate for an exploratory study such as this one (Mertler & Vannatta, 2005). Backward deletion involves the statistical software program analyzing each of the independent variables for its contribution to predicting the dependent variable then deleting the least predictive from the model. This process is repeated until only variables that contribute significantly to the prediction of the dependent variable remain (Foster, Barkus, and Yavorsky, 2006; Mertler and Vannatta, 2005). This grouping of variables, or model, is the most parsimonious, that is, contains the fewest independent variables that together explain the most variance in the dependent variables (Mertler & Vannatta, 2005).

In this study, four models resulted from the analysis of the six Motivation Scales with high school GPA and six models resulted from the analysis of the Learning Strategies Scales with high school GPA. But before those are presented, it must
be established that problems invalidating the results of the analysis are not present and that the predictions provided by the models are significant.

This will be done by reporting three groups of statistics resulting from each Multiple Regression analysis. All three will be reported in table form with separate tables for the Motivation Scales results and the Learning Strategy Scales results. First, the beta coefficients and collinearity statistics will be reported to establish the integrity of the analysis and relative weight of each variable. Next, the significance statistic obtained from an analysis of variance (ANOVA) for the data will be reported to establish the significance of the results obtained. And, finally, the R square statistic in the model summaries will be presented to show the ability of various models to explain the dependent variable, final course grade (Cronk, 2008; Mertler & Vannatta, 2005).

Tables 15 and 16 show measures of collinearity for all variables in the overall model. These values are important for detecting the importance of multicollinearity which can cause statistical problems for the researcher. In essence, multicollinearity occurs when independent variables are similar and, therefore, highly correlated with one another. In that event, the constructs being measured are overlapping and the integrity of the regression analysis is compromised (Foster, Barkus, and Yavorsky, 2006; Mertler & Vannatta, 2005). Mertler & Vannatta (2005) state that multicollinearity becomes a problem when the tolerance value is less than 0.1 and the variance inflation factor (VIF) is more
Table 15

Coefficients and Collinearity Statistics for Motivation Scales

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>HS GPA</td>
<td>.647</td>
<td>.112</td>
<td>.348</td>
</tr>
<tr>
<td>Intrinsic Goal Orientation (INTR)</td>
<td>-.061</td>
<td>.063</td>
<td>-.087</td>
</tr>
<tr>
<td>Extrinsic Goal Orientation (EXTR)</td>
<td>.053</td>
<td>.048</td>
<td>.072</td>
</tr>
<tr>
<td>Task Value (TV)</td>
<td>.109</td>
<td>.059</td>
<td>.165</td>
</tr>
<tr>
<td>Control of Learning Beliefs (CONT)</td>
<td>-.047</td>
<td>.059</td>
<td>-.059</td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance (SE)</td>
<td>.241</td>
<td>.061</td>
<td>.309</td>
</tr>
<tr>
<td>Test Anxiety (TA)</td>
<td>-.104</td>
<td>.037</td>
<td>-.186</td>
</tr>
</tbody>
</table>

The tolerance values for the Motivation Scales ranged from .438 to .947 and the VIF ranges from 1.213 to 2.282. The tolerance values for the Learning Strategy scales range from .186 to .941 and the VIF ranges from 1.063 to 5.379. Because these values fall within the acceptable parameters, multicollinearity has been avoided as a problem in this study.

Additionally, Table 15 and 16 show the Beta coefficients for the regression analyses. Beta coefficients are useful for comparing the relative size of an independent variable’s contribution to a model (Pallant, 2007). In both regression analyses, high school GPA was the largest contributor to the model. Of the Motivation Scales, the top three contributors were, in order, Self-Efficacy for Learning and Performance, Test Anxiety, and Task Value. Of the Learning
Strategies Scales, the top three contributors were Time and Study Environment, Metacognitive Self-Regulation, and Critical Thinking.

Table 16

Coefficients and Collinearity Statistics for Learning Strategies Scales

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>HS GPA</td>
<td>.806</td>
<td>.121</td>
<td>.434</td>
</tr>
<tr>
<td>Rehearsal (RH)</td>
<td>-.090</td>
<td>.058</td>
<td>-.155</td>
</tr>
<tr>
<td>Elaboration (EL)</td>
<td>.000</td>
<td>.070</td>
<td>.000</td>
</tr>
<tr>
<td>Organization (ORG)</td>
<td>-.039</td>
<td>.065</td>
<td>-.063</td>
</tr>
<tr>
<td>Critical Thinking (CRIT)</td>
<td>.139</td>
<td>.062</td>
<td>.222</td>
</tr>
<tr>
<td>Metacognitive Self-Regulation (MS)</td>
<td>-.215</td>
<td>.110</td>
<td>-.288</td>
</tr>
<tr>
<td>Time &amp; Study Environment (TS)</td>
<td>.234</td>
<td>.078</td>
<td>.349</td>
</tr>
<tr>
<td>Effort Regulation (ER)</td>
<td>-.030</td>
<td>.061</td>
<td>-.052</td>
</tr>
<tr>
<td>Peer Learning (PRLRN)</td>
<td>-.005</td>
<td>.056</td>
<td>-.010</td>
</tr>
<tr>
<td>Help Seeking (HSK)</td>
<td>.023</td>
<td>.054</td>
<td>.039</td>
</tr>
</tbody>
</table>

The significance of the contribution of each scale is also shown in the table. In general, significance values of less than .05 are considered indicative of a variable making a unique contribution to the model (Pallant, 2007). In this exploratory study, however, all scales with a significance value of .1 or more were considered for their contribution to the model. The top three contributors
to both the Motivation Scales model and the Learning Strategies Scales model fit this criterion. Determining that the study was not compromised by collinearity problems and knowing the major individual contributors for final course grade among the MSLQ scales, the researcher was able to confidently move on to analyzing the second important statistic, the significance value from the analysis of variance (ANOVA) reported for the data.

Tables 17 and 18 show the significance statistics for ANOVAs related to this regression procedure. Values in this statistic that are less than .05 indicate a significant linear regression (Cronk, 2008). In other words, the relationship between the model (in this case, the group of MSLQ scales) and the outcome variable (in this case, final course grade) would be considered significant if the significance value were to fall below .05. Because the significance statistic for all models in the both the Motivation Scales analysis and the Learning Strategy Scales analysis is .000, the results of the regression analyses can be said to be significant for all models. The ANOVA tables also show which independent, or predictor, variables are included in each model. For the Motivation Scales, Model 4 is most parsimonious, where the predictors of Self-Efficacy for Learning and Performance, Test Anxiety and high school GPA together best explain or predict Final Course Grade. For the Learning Strategies Scales, Model 6 is most parsimonious, where Critical Thinking, Time & Study Environment, Metacognitive Self-Regulation and high school GPA best explain or predict Final Course Grade. Having established that all models were significant, the
Table 17

ANOVA Summary Table for Motivation Scales

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors Included in Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HS GPA, EXTR, INTR, TA, CONT, SE, TV</td>
<td>46.150</td>
<td>7</td>
<td>6.593</td>
<td>14.332</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>HS GPA, EXTR, INTR, TA, SE, TV</td>
<td>45.859</td>
<td>6</td>
<td>7.643</td>
<td>16.647</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>HS GPA, EXTR, TA, SE, TV</td>
<td>45.420</td>
<td>5</td>
<td>9.084</td>
<td>19.790</td>
<td>.000</td>
</tr>
<tr>
<td>4</td>
<td>HS GPA, TA, SE, TV</td>
<td>44.798</td>
<td>4</td>
<td>11.200</td>
<td>24.353</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. Dependent Variable: Final Course Grade

Table 18

ANOVA Summary Table for Learning Strategies Scales

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors Included in Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, PRLRN, EL, TS, MS</td>
<td>33.979</td>
<td>10</td>
<td>3.398</td>
<td>6.376</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, PRLRN, TS, MS</td>
<td>33.979</td>
<td>9</td>
<td>3.775</td>
<td>7.123</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, TS, MS</td>
<td>33.974</td>
<td>8</td>
<td>4.247</td>
<td>8.055</td>
<td>.000</td>
</tr>
<tr>
<td>4</td>
<td>HSGPA, RH, CRIT, ER, ORG, TS, MS</td>
<td>33.860</td>
<td>7</td>
<td>4.837</td>
<td>9.213</td>
<td>.000</td>
</tr>
<tr>
<td>5</td>
<td>HSGPA, RH, CRIT, ORG, TS, MS</td>
<td>33.727</td>
<td>6</td>
<td>5.621</td>
<td>10.748</td>
<td>.000</td>
</tr>
<tr>
<td>6</td>
<td>HSGPA, RH, CRIT, TS, MS</td>
<td>33.547</td>
<td>5</td>
<td>6.709</td>
<td>12.873</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. Dependent Variable: Final Course Grade

researcher more confidently approached the final statistic important in Multiple Regression results, the R square value in the model summary.

The R square values in the model summaries provided (see Table 19 and 20) reveal the extent to which groups of variables explain or predict the final
course grade. More specifically, this value tells the researcher how much of the variance in the dependent variable (in this study, final course grade) is explained by the independent variables (in this study, the group of MSLQ scales means). In other words, if a participant’s final course grade was higher, the R square value shows how much of the higher grade could be explained by higher levels of motivations as measured by the MSLQ Motivation Scales or how much of that grade could be explained by greater use of learning strategies as measured by the MSLQ Learning Strategy Scales (Cronk, 2008). The R square value can be stated as a percentage.

The model summary for Model 1 of the Motivation Scales (see Table 19) shows an R square value of .347 or 34.7%. This means that 34.7% of a student’s final course grade can be predicted or explained by that student’s MSLQ Motivation Scale scores and high school GPA. Model 4, the most parsimonious model, shows an R square value of .337. This means that when three predictor variables are removed, the remaining four variables continue to explain 33.7% of a student’s Final Course Grade. Therefore, the Motivation Scales most able to predict a student’s final course grade are those included in that model: Test Anxiety, Self-Efficacy for Learning and Performance and Task Value.

The model summary for Model 1 of the Learning Strategy Scales (see Table 20) shows an R square value of .255 or 25.5%. This means that 25.5% of a participant’s final course grade can be explained or predicted by that participant’s MSLQ Learning Strategy Scale scores and high school GPA.
Table 19

Multiple Regression Model Summary for MSLQ Motivation Scales

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors Included in Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSGPA, EXTR, INTR, TA, CONT, SE, TV</td>
<td>.589</td>
<td>.347</td>
<td>.323</td>
<td>.678</td>
</tr>
<tr>
<td>2</td>
<td>HSGPA, EXTR, INTR, TA, SE, TV</td>
<td>.587</td>
<td>.345</td>
<td>.324</td>
<td>.678</td>
</tr>
<tr>
<td>3</td>
<td>HSGPA, EXTR, TA, SE, TV</td>
<td>.584</td>
<td>.341</td>
<td>.324</td>
<td>.678</td>
</tr>
<tr>
<td>4</td>
<td>HSGPA, TA, SE, TV</td>
<td>.580</td>
<td>.337</td>
<td>.323</td>
<td>.678</td>
</tr>
</tbody>
</table>

Note. HSGPA=High School GPA; EXTR=Extrinsic Goal Orientation; INTR=Intrinsic Goal Orientation; TA=Test Anxiety; CONT=Control of Learning Beliefs; SE=Self-Efficacy for Learning and Performance; TV=Task Value.

Model 6, the most parsimonious model, shows an R square value of .252. This means that when six predictor variables are removed, the remaining four variables continue to explain 25.2% of a student’s Final Course Grade. Therefore, the Learning Strategies Scales most able to predict a student’s final course grade are those included in that model: Rehearsal, Critical Thinking, Time and Study Environment, and Metacognitive Self-Regulation.

In summary, Multiple Regression statistics reveal that groups of MSLQ scale scores, some more than others, can predict from a quarter to a third of a student’s Final Course Grade. Research Question 3 having been answered as thoroughly as possible, we can now turn to Research Question 4 and examine the relationship of MSLQ scores and student retention.
Table 20

Multiple Regression Model Summary for MSLQ Learning Strategies Scales

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors Included in the Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, PRLRN, EL, TS, MS</td>
<td>.505</td>
<td>.255</td>
<td>.215</td>
<td>.730</td>
</tr>
<tr>
<td>2</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, PRLRN, TS, MS</td>
<td>.505</td>
<td>.255</td>
<td>.219</td>
<td>.728</td>
</tr>
<tr>
<td>3</td>
<td>HSGPA, HSK, RH, CRIT, ER, ORG, TS, MS</td>
<td>.505</td>
<td>.255</td>
<td>.224</td>
<td>.726</td>
</tr>
<tr>
<td>4</td>
<td>HSGPA, RH, CRIT, ER, ORG, TS, MS</td>
<td>.504</td>
<td>.254</td>
<td>.227</td>
<td>.725</td>
</tr>
<tr>
<td>5</td>
<td>HSGPA, RH, CRIT, ORG, TS, MS</td>
<td>.503</td>
<td>.253</td>
<td>.230</td>
<td>.723</td>
</tr>
<tr>
<td>6</td>
<td>HSGPA, RH, CRIT, TS, MS</td>
<td>.502</td>
<td>.252</td>
<td>.232</td>
<td>.722</td>
</tr>
</tbody>
</table>

Note. HSGPA= High School GPA; HSK=Help-Seeking; RH=Rehearsal; CRIT=Critical Thinking; ER=Effort Regulation; ORG=Organization; PRLRN=Peer Learning; EL=Elaboration; TS=Time and Study Environment; MS=Metacognitive Self-Regulation.

Research Question 4

Research Question 4 and its corresponding research hypothesis are restated below.

Research Question 4: Are MSLQ scale scores significant predictors of college student retention?

Research Hypothesis: MSLQ scale scores are significant predictors of student persistence into the following semester.

The statistical procedure used to address this question was Logistic Regression. Logistic Regression is similar to Multiple Regression except that the dependent variable can be dichotomous, that is, fall into one of two categories such as “pass” or “fail” (Mertler & Vannatta, 2005). Logistic Regression defines the
extent to which a dependent variable can be explained by a grouping of independent variables or a model.

Two challenges were encountered in conducting this analysis. The first was the fact that enrollment status for the following semester could only be known at the time of the analysis for the 110 participants that completed the MSLQ in the Fall 2010 semester. Spring 2011 participants’ enrollment status could not be determined until September 2011, after the time of this writing. However, the researcher decided to proceed with a preliminary analysis of the data to become familiar with the procedures which could then be repeated when the additional data could be obtained. The Case Processing Summary in Table 21 shows that 45.5 % of the cases were missing at the time the analysis was completed.

The second challenge in responding to this research question was a problem of data distribution. Of the 110 participants in the study, only 3 of them had not enrolled in the Spring 2011 semester. In other words, 107 of 110 were retained to the following semester while only 3 of 110 were not (see Table 22). Foster, Barkus, and Yakorsky (2006) warn that in Logistic Regression, “problems arise if there are too few cases relative to the number of predictors” (p.62). Tabachnik and Fiddell (1996) describe how a small number of cases in proportion to predictors can lead to excessively high coefficients for the predictors or very large standard errors.
Table 21

Case Processing Summary for Logistic Regression

<table>
<thead>
<tr>
<th></th>
<th>Unweighted Cases</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected Cases</td>
<td>Included in Analysis</td>
<td>110</td>
<td>54.5</td>
</tr>
<tr>
<td></td>
<td>Missing Cases</td>
<td>92</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>202</td>
<td>100.0</td>
</tr>
<tr>
<td>Unselected Cases</td>
<td></td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>202</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Problems did, in fact, arise and large coefficients and errors were obtained.

When seeking to run the logistic regression, messages such as “estimation terminated” and “final solution cannot be found” tagged results presented by the statistical software program. Table 23 displays the disproportionate coefficients and errors that resulted.

Table 22

Classification Table for Logistic Regression

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted Retained to next semester?</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Step 1 Retained to next semester?</td>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus, there is no evidence discovered in this study that would suggest that motivation and use of learning strategies as measured by the MSLQ are
significant predictors of a student’s likelihood to remain enrolled into the following semester.

The question may be posed whether adding cases to the data set by waiting until the enrollment status of Spring 2011 participants could be obtained and, subsequently, re-analyzing the data would improve the situation. The researcher decided not to wait until September 2011 and re-analyze the data because even in the unlikely event that twice as many participants (6) did not return for the Fall 2011 semester, the distribution of participants into the “retained” and “not retained” groups would continue to be widely unequal and disproportionate to the number of predictors in the study. In other words, completing the Logistic Regression analysis on 9 out of 202 participants is not

Table 23

Unusable Results Obtained from Logistic Regression with Too Few Cases

<table>
<thead>
<tr>
<th>Step 1</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower               Upper</td>
</tr>
<tr>
<td>Intrin</td>
<td>1.797</td>
<td>1.222</td>
<td>2.161</td>
<td>1</td>
<td>.142</td>
<td>6.031</td>
<td>.549                 66.187</td>
</tr>
<tr>
<td>Extrinsic Goal Orientation (EXTR)</td>
<td>1.242</td>
<td>.802</td>
<td>2.401</td>
<td>1</td>
<td>.121</td>
<td>3.462</td>
<td>.720                 16.660</td>
</tr>
<tr>
<td>Task Value (TV)</td>
<td>-2.421</td>
<td>1.315</td>
<td>3.390</td>
<td>1</td>
<td>.066</td>
<td>.089</td>
<td>.007                 1.169</td>
</tr>
<tr>
<td>Control of Learning Beliefs (CONT)</td>
<td>.951</td>
<td>.936</td>
<td>1.031</td>
<td>1</td>
<td>.310</td>
<td>2.587</td>
<td>.413                 16.199</td>
</tr>
<tr>
<td>Self-Efficacy for Learning &amp; Performance (SE)</td>
<td>-1.613</td>
<td>1.130</td>
<td>2.039</td>
<td>1</td>
<td>.153</td>
<td>.199</td>
<td>.022                 1.824</td>
</tr>
<tr>
<td>Test Anxiety (TA)</td>
<td>-.044</td>
<td>.560</td>
<td>.006</td>
<td>1</td>
<td>.937</td>
<td>.957</td>
<td>.319                 2.868</td>
</tr>
<tr>
<td>Help-Seeking (HSK)</td>
<td>-.570</td>
<td>.610</td>
<td>.874</td>
<td>1</td>
<td>.350</td>
<td>.565</td>
<td>.171                 1.869</td>
</tr>
<tr>
<td>Constant</td>
<td>7.307</td>
<td>6.455</td>
<td>1.282</td>
<td>1</td>
<td>.258</td>
<td>1490.998</td>
<td></td>
</tr>
</tbody>
</table>
much more likely to yield meaningful results than the analysis done with 3 out of 110.

Summary

This study was able to address three of the four research questions and provide evidence in support of two of the three research hypotheses. There were significant differences between freshmen and sophomores in their motivational beliefs and skills when approaching the learning task. Freshmen were more likely than sophomores to believe that their success or failure in learning is under their control and that their effort will make a difference to the outcome of a course. On the other hand, sophomores were more likely than freshmen to view themselves as efficacious and to be confident in approaching the task of learning and performing well in a course. Sophomores, however, were likely to experience higher levels of test anxiety when faced with tests and exams in their courses. However, these differences, while significant, were found to be small when analyzed for their effect size.

In regard to actual achievement in a course as measured by the grade a student received in that course, a student’s motivational skills and beliefs and their use of learning strategies did relate to their achievement. Almost a third of a student’s final course grade can be explained by that student’s motivation toward learning, most importantly, that student’s level of test anxiety and self-
efficacy for the learning task. Over a quarter of a student’s final course grade can be explained by that student’s use of learning strategies. Among these strategies the most important are that student’s ability to think critically, to choose and use an optimal study environment and time management techniques, and to be aware of his or her own learning, adjusting the study techniques used as appropriate for the course and the learning situation.

Due to a low number of non-persisting students, the study was unable to address the relationship of motivation for learning with retention. Similarly, the study was unable to address the relationship of use of learning strategies with retention. So while motivation and learning strategies do differ between traditional-aged students in the first and second year of college and do influence the achievement of these students, it remains unclear whether these constructs influence their likelihood of remaining in college rather than dropping or stopping out.

Table 24 summarizes the major findings of the study. Interpretations and implications of these findings and of other results reported in this chapter will be discussed in Chapter V.
## Table 24

Major Findings from the Study

| Hypothesis 1: | Accepted; Null rejected | Freshmen significantly higher in Control of Learning Beliefs  
Hypothesis 2: There is a significant relationship between MSLQ scale scores and student achievement in the course as measured by final course grade. | Sophomores significantly higher in Self-Efficacy for Learning and Performance  
Sophomores significantly higher in Test Anxiety  
Although significant, differences had a small effect sizes  
No significant differences on any Learning Strategy Scales  
Four motivation scales (Task Value, Control of Learning Beliefs, Self-Efficacy for Learning and Performance and Test Anxiety) significantly correlated with Final Course Grade; correlations for Task Value and Control of Learning Beliefs are weak; correlations for Self-Efficacy for Learning and Performance and Test Anxiety are moderate  
No significant correlation between any Learning Strategy Scale and Final Course Grade  
Motivation Scales and High School GPA explain 34.7% Final Course Grade; Self-Efficacy for Learning and Performance, Test Anxiety, Task Value and High School GPA explain 33.7% of Final Course Grade  
Learning Strategies Scales and High School GPA explain 25.5% of Final Course Grade; Critical Thinking, Time and Study Environment, Metacognitive Self-Regulation, Rehearsal and High School GPA explain 25.2% of Final Course Grade  
No findings for this hypothesis |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling for high school GPA, sophomore scores on MSLQ subscales will differ significantly from those of freshmen in the study.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis 3: MSLQ subscale scores are significant predictors of student persistence into the following semester. | No evidence produced by study; Null accepted by default |
|  
No significant differences on any Learning Strategy Scales |  
No significant correlation between any Learning Strategy Scale and Final Course Grade | No findings for this hypothesis |
CHAPTER V
SUMMARY AND DISCUSSION

Introduction

Chapter IV presented the results of the statistical analysis completed using the data collected for the study. Chapter V reviews the goals and purpose of the study, summarizes findings and presents interpretations of those findings for each hypothesis considered in the study. Implications of the findings for educational practice are discussed and models of motivational patterns and use of learning strategies that lead to student success are proposed. Suggestions for future research are provided before a final concluding summary.

Summary of the Study

This study explored whether students’ motivation for learning and use of learning strategies develop in the first two years of college and the ways that this development may contribute to students’ success or likelihood of continuing
their journey through college. More specifically, the study explored the following research questions and corresponding hypotheses:

**Research Question 1:** What pattern(s) of motivation and what use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

**Research Question 2:** After controlling for prior achievement as measured by high school grade point average (GPA), what similarities and differences in the patterns of motivation and use of learning strategies as measured by the MSLQ can be found in freshmen and in sophomores at a four-year college or university?

**Hypothesis:** Controlling for high school GPA, sophomore scores on MSLQ scales differ significantly from those of freshmen in the study.

**Null Hypothesis:** Controlling for high school GPA, there are no significant differences between freshmen and sophomores in the motivation and learning strategy scales of the MSLQ.

**Research Question 3:** Is there a significant relationship between motivation or use of learning strategies and student achievement as measured by final course grade?

**Hypothesis:** There is a significant relationship between MSLQ scale scores and student achievement in the course as measured by final course grade.

**Null Hypothesis:** There is no significant relationship between motivation and learning strategy scale scores and student achievement as measured by final course grade.

**Research Question 4:** Are MSLQ scale scores significant predictors of college student retention/persistence?

**Hypothesis:** MSLQ scale scores are significant predictors of student persistence into the following semester.

**Null Hypothesis:** Motivation and learning strategy scale scores are not significant predictors of student persistence into the following semester.
The intent of the study was to provide useful information to university administrators, instructors, advisors, and student development professionals regarding how to best support student success and retention at the institution where the study took place. Additionally, the study sought to address a gap in the research literature left by an almost exclusive focus on cognitive skills and their influence on student success and retention and inattention to the ability of motivational beliefs and affect to influence these same outcomes.

Much of the research done to date on college student success has emphasized cognitive factors such as high school GPA or SAT scores even though these are unlikely to explain more than 40% of the variance in a college student’s first year GPA (Mattern & Shaw, 2010). Following Tinto’s (1987) Model of Institutional Departure, the literature focused upon the influence of institutional characteristics or student characteristics such as race, gender and academic ability on student retention. Later, Bean (2000) proposed a model of college student retention incorporating student psychological factors such as personality, self-efficacy, attributions, normative beliefs, coping strategies, and motivation to attend university. Consequently, this study builds on this literature by exploring students’ motivational beliefs and cognitive skills as predictors of college student success and comparing traditional-aged college students in their first year of college with those who have persisted to a second year of higher education.
This study employed the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1991) as an instrument to measure six motivational constructs and the use of nine learning strategies in college freshmen and sophomores. Two of the motivational constructs measured by the MSLQ are Intrinsic and Extrinsic Goal Orientation. These constructs refer to the sources of a student’s desire to work. If the desire results from curiosity and enjoying the challenge of learning, the student has an intrinsic goal orientation. On the other hand, if a student’s desire to work comes from an appreciation for external rewards, the student has an extrinsic goal orientation (Pintrich et al., 1991). Task Value is also measured by the MSLQ. This construct refers to the student’s perception of a task as personally interesting or worthwhile (Pintrich et al., 1991). The next motivational construct measured by the MSLQ, Control of Learning Beliefs, refers to a student’s beliefs concerning the relationship of their efforts to succeed or fail in a task (Pintrich et al., 1991). The Self-Efficacy for Learning and Performance scale measures a student’s assessment of their own ability to complete a task (Pintrich et al., 1991). The final motivation-based MSLQ scale, Test Anxiety, measures the student’s self-reported feelings of nervousness or anxiety when taking an exam or test (Pintrich et al., 1991). While higher scores on all other MSLQ Motivation scales indicate that the student possesses a higher level of a positive motivational construct that aids performance, higher scores on this scale are associated with a lower level of performance (VanderStoep & Pintrich, 2003).
The nine Learning Strategies Scales on the MSLQ measure the extent to which a student reports using particular methods or strategies when studying the course content. The Rehearsal scale measures the use of a lower-level strategy in which the student memorizes information through repetition (Pintrich et al., 1991). The Elaboration scale measures the extent to which a student builds a deeper understanding of material by drawing connections between the new material and information that is already known by the student (Pintrich et al., 1991). The MSLQ Organization scale measures how often a student seeks to identify important information, connect concepts with one another, and recognize relationships between ideas and facts (Pintrich et al., 1991). The scale of Critical Thinking assesses a student’s ability to apply data, concepts, and facts in various ways so that it becomes meaningful. Critical thinking can involve evaluating evidence for a position or argument or considering a variety of viewpoints on an issue (Pintrich et al., 1991).

Metacognitive Self-Regulation is the MSLQ scale that measures how students plan, monitor, adapt, and control their own learning processes (Pintrich et al., 1991). The Time and Study Environment scale gauges the student’s use of time and space so as to maximize college success (Pintrich et al., 1991). Effort Regulation is the MSLQ scale that measures a student’s ability to persist when a task seems to become boring or difficult (Pintrich et al., 1991). The final two scales, Peer Learning and Help-Seeking, measure how students interact with others when seeking to learn course content. Peer Learning measures how often
they work or study with classmates while Help-Seeking measures how likely they are to request available assistance from more competent people such as tutors or faculty members (Pintrich et al., 1991; Vander Stoep & Pintrich, 2003).

Data was collected in the Fall 2010 and Spring 2011 semesters from a convenience sample of 93 freshmen and 109 sophomores at a mid-sized private university in the Midwest. All respondents were enrolled in one of 17 sections of the History 180 general education course at the university. Using Qualtrics survey software, potential respondents were sent a link to an online version of the 81 MSLQ items and six demographic items. The first screen of the questionnaire served as a consent form and participants were not able to proceed until indicating their consent to participate. Participants were identified only by their university identification number from that point forward to ensure anonymity. Future communication with respondents occurred through the use of the campus mailbox number they provided. Responses to all questionnaire items were captured and transferred to an Excel spreadsheet. The researcher visited History 180 classrooms to recruit participants, incentives for participation were offered, and three reminders were sent to potential respondents. After two semesters of data collection and a response rate of 44.1%, the desired sample size was reached to ensure the statistical power of the study. Other data needed for the study—high school GPA, final course grade for History 180, and enrollment status—was obtained through the university’s Office of Institutional Research and transferred to the Excel spreadsheet for analysis.
MSLQ item responses were reversed as required by the instrument and scale scores were calculated. Participants in the study were sent a report of their scores, accompanying study tips, and a $1 coffee shop coupon in appreciation for their participation.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) Version 19.0. Frequencies of demographic characteristics were tallied to describe the research sample. In keeping with the needs of the research questions and data analysis plan, the statistical procedures completed with the collected data were a multivariate analysis of covariance (MANCOVA), calculation of Pearson correlation coefficients, backward stepwise multiple regression, and a logistic regression. The results of these procedures were presented in Chapter IV and, after a discussion of the study’s limitations will be reviewed and interpreted the subsequent section.

Limitations

While this study did yield significant findings, it also has significant limitations. These are listed and explained here.

First of all, there are limitations related to the sample. The sample size of 93 freshmen and 109 sophomores fell short of the optimal sample size which required 100 freshmen in the sample. A larger sample size would increase the researcher’s confidence in the results obtained. And while it is difficult to confirm, the fact that half of the participants were surveyed in the fall semester
and half were surveyed in the spring semester may have influenced the outcome of the results. It may be that the students who completed the questionnaire in the first semester of their freshmen year would respond quite differently if they had completed the questionnaire in their second semester, having had more opportunity to develop self-efficacy or an appreciation for rehearsal as a learning strategy. In addition, it is logical to assume that instructors and their teaching methods affect students’ motivations and achievements. It is impossible to know the influence of the fact that students in the sample were part of 17 different sections of History 180 with various instructors and undoubtedly had different classroom experiences. Another potential weakness is that although the questionnaire did not ask for information regarding student majors, it would be logical to assume that few if any nursing majors or education majors were represented in the sample because, at the university where the study took place, students in these majors are not required to take History 180 as part of their degree program. Of course, because the participants were freshmen and sophomores, it is possible that students that participated in the study would declare a major in one of these fields in future years. But, even if the information were available, it is unlikely that many students in these majors would be found in this sample.

Secondly, there are limitations in one’s ability to generalize from the results of this study to students at other types of institutions or students taking courses other than a general education history course. Because the study took
place a mid-sized, private university consisting of traditional-aged students representing very little ethnic diversity, one’s ability to generalize the findings is limited to other institutions of this kind. And while McKeachie, Pintrich and Lin (1984) state the conviction that, once learned, motivation and learning strategies can carry over into a variety of courses, it is important to note that care must be taken in generalizing results obtained from students enrolled in a History course to students enrolled in courses in other disciplines.

Thirdly, the high retention rate at the university made it impossible to address Research Question 4, the question of most interest to those wanting to increase retention at the institution. In fact, only three students failed to persist into the next semester. This is a flaw in the research design considering the context of the study. The disparity in numbers of those who persisted and those who did not could have been foreseen by examining the retention rate at this particular university before beginning the study. This method may work better at a community college or institution where the retention rate is lower. In such a context, the results yielded may also be more important. Better ways of investigating the relationship of retention with motivation for learning and use of learning strategies need to be developed.

Findings and Interpretations

Despite the limitations of the study, significant findings were obtained that allowed acceptance of two of the three research hypotheses. The findings
from the testing of each hypothesis will be reviewed and interpreted in the following sections. For the third research hypothesis, the small number of students who did not return to the university in the following semester limited the statistical procedures from providing any conclusive results.

Findings from Testing Hypothesis 1

The study revealed small but significant differences between freshmen and sophomores co-enrolled in the general education History class at the university. The scales on which freshmen and sophomores differed significantly were three of the six Motivation Scales: Control of Learning Beliefs, Self-Efficacy for Learning and Performance, and Test Anxiety. There were no significant differences found between the two groups on any of the nine Learning Strategies Scales.

Freshmen had significantly higher scores than sophomores on the Control of Learning Beliefs scale of the MSLQ. This means that freshmen were more likely to believe that their effort was the cause of success or failure in the course than did sophomores. This outcome differs from what might be expected in light of a previous study (Guarino & Hocevar, 2005). In that study, students identified as possessing an internal locus of control were more likely to remain in college while those with an external locus of control were more likely to drop out. Thus, sophomores might be expected to have more of an internal locus of control than freshmen. In contrast, considering the similarities between the Control of
Learning Beliefs construct in this study and the construct of locus of control measured in Guarino and Hocevar’s work, the finding in this present study suggests that freshmen have more of a sense of control over their college success than sophomores do.

Another aspect of this finding is that, in theory (Weiner, 1986), students with a stronger belief that their effort will lead to success or failure in the course, would expend more effort and employ more learning strategies in order to do well in the course. But there is no difference between freshmen and sophomores on any of the Learning Strategies Scales that corresponds to this one on the Control of Learning Beliefs scale. So while freshmen in this sample may hold a stronger belief that their expenditure of effort will lead to greater success, this belief does not necessarily translate into a significantly higher use of any of the nine learning strategies considered in this study.

The question of why freshmen hold to this conviction more strongly is cause for speculation. Perhaps in their first year of college, they are naïve or closer to the days of high school graduation or freshmen orientation in which the message that their future success was up to them was communicated in a variety of ways. It could be that sophomores, having completed the first year, are more realistic in their expectations (Schaller, 2007). In the second year of college, there is no course such as the freshman seminar in which the student is surrounded by others and advised that with effort one can succeed. It could be that sophomores have had experiences leading them to believe that college success
takes a lot more than studying often and trying hard—navigating the registration process, qualifying for necessary financial aid, understanding which courses fit together into a major, and holding things together in one’s personal life, to name a few (Pattengale, 2000; Gansemer-Topf, Stern, & Benjamin, 2007). These factors may also help to explain other findings of the study regarding the differences between freshmen and sophomores.

The other findings of this study concerning the differences between freshmen and sophomores followed previous research more closely. The finding that sophomores were higher in Self-Efficacy for Learning and Performance is consistent with Bandura’s (1977) theory that enactive attainments, also called performance accomplishments, build self-efficacy, the belief that one is competent in a particular task. In other words, each quiz passed, course satisfactorily completed, paper successfully written, would build a student’s self-efficacy. Theoretically, sophomores, having had more of these successful experiences at the college level, would show a higher level of self-efficacy.

Moreover, this finding is consistent with an expectation supported by the literature that students retained to a second year would be higher in self-efficacy. For example, Pajares (1996) found that students with a heightened sense of self-efficacy are more likely to persist in a learning task. In addition, Bean’s Psychological Model of College Student Retention (2000) posited that students’ higher self-efficacy results in a greater level of academic integration at the
institution, a greater sense of institutional fit on the part of the student, and an intent to persist, followed by persistence.

The higher level of self-efficacy in sophomores, however, is accompanied by a greater level of self-reported test anxiety. These do not seem to fit together; Bandura (1977) would suggest that physiological states such as those measured by the Test Anxiety scale—increased heart rate or an upset, uneasy feeling—would detract from the development of self-efficacy. Likewise, Pajares (1996) discussed the way that low self-efficacy leads to stress or depression while high self-efficacy leads to a sense of “serenity” (p. 545) in the face of difficulty.

One could speculate similarly to the earlier discussion that the sophomores had a more realistic picture of the importance of tests to their final grade. That is, while they have grown in confidence or efficacy when it comes to doing well in a course, they know from experience that their performance on tests will have a strong influence on their grade. Therefore, they experience more anxiety when taking tests and quizzes. Perhaps that extra year of experience, in addition to lowering their sense that success will follow closely from their effort, may make them more confident that they can get through it even as they realize the import of test and exams on that success. While beyond the scope of this study, it may be interesting to discover what percentage of the final grade is earned through tests and quizzes in this course to see if this speculation is borne out.
Although previous research might lead one to expect differences between freshman and sophomores on the Learning Strategies scales, no significant differences were found in this study. Considering Zusho, Pintrich, and Coppola’s (2003) finding that Organization increased in use as a strategy over the course of a semester, one may have expected to find sophomores using this strategy more often. However, the contrasting findings here may be a matter of context. The finding in question resulted from a study of a chemistry course while this study investigated strategy use in a history course. This underlines the necessity of keeping in mind that different strategies may be more or less useful in courses in different disciplines.

Based on Lehmann’s (1962) study of the development of critical thinking between the freshman and senior years, the current study may have been expected to find a difference between freshmen and sophomores on the MSLQ Critical Thinking scale. While Lehmann found that there were significant gains in critical thinking during college, mostly during the first two years, no such gain was detected in this study. But, again, context is important. Lehman’s study was conducted in the late 1950’s through early 1960’s and took place at Michigan State University. The current study was conducted in 2010-2011 at a small, private, liberal arts college. Perhaps the changes that 50 years can make combined with the differing institutional characteristics led to the failure of the current study to find a significant difference between freshmen and sophomores on this scale.
Findings from Testing Hypothesis 2

The second hypothesis examined the relationship of MSLQ scales scores and student achievement as measured by final grade in the History 180 course. The findings reveal that four of the six MSLQ Motivation Scale scores—Task Value, Control of Learning Beliefs, Self-Efficacy for Learning and Performance, and Test Anxiety—are significantly correlated with the final course grade. Here again, the results for the Self-Efficacy for Learning and Performance scale emerge as consistent with previous findings. When the MSLQ was developed and tested (Pintrich, Smith, Garcia, and McKeachie, 1993), the Self-Efficacy scale showed the greatest significant correlation with final course grade with a value of .41. Similarly, the strongest significant correlation value found in this study between an MSLQ scale and final course grade was .409 and was found between the Self-Efficacy for Learning and Performance scale and final course grade.

The second strongest correlation found in the current study between final course grade and a Motivation Scale was the correlation between Test Anxiety and final course grade (-.302). This correlation is a negative one as expected, with higher test anxiety correlating with poorer performance. This result is similar to the result of -.27 obtained when Pintrich, Smith, Garcia, and McKeachie (1993) developed and tested the MSLQ instrument.

Some of the correlations between the scales were also consistent with previous research and are worth noting here. The strong correlation between
Intrinsic Goal Orientation and Task Value (.726) supports the connection made in McKeachie, Pintrich, Lin and Smith’s (1986) Components of Motivation Model and Dweck’s (1986) work in Goal Theory between a student valuing a task and their perception of that task as helpful in attaining a goal. Both Husman, Derryberry, Crowson and Lomax (2004) and Pintrich et. al.’s (1991) early analysis of the MSLQ found a significant relationship between Intrinsic Goal Orientation and Task Value. This suggests that drawing connections for students between a learning task and their personal goals may help increase interest in the task. For example, if a student wants to become a nurse, that student is likely to have a high level of interest in the learning task of practicing inserting IVs into the arms of classmates. A student who wants to become an accountant would likely have little interest in this task as it is unrelated to the student’s goals.

Of the findings, perhaps the most interesting and practical are those related to which Motivation Scales and which Learning Strategies Scales best predict or explain academic achievement. In this study, over a third (34.7%) of a student’s final course grade in History 180 can be explained by their scores on the six MSLQ Motivation Scales and high school GPA. More importantly, when the multiple regression model found in Chapter IV is revised to become the most parsimonious (that is, using the fewest variables to explain the most about the outcome), only three Motivation Scales along with high school GPA continue to predict 33.7% of the final course grade. These three Motivation Scales are Self-Efficacy for Learning and Performance, Test Anxiety and Task Value. This
result reveals that for this sample of students at this university taking History 180, these motivational factors strongly influence their achievement. Likewise, for the Learning Strategies scales, in the most parsimonious model, 25.5% of final course grade can be explained by scores on the MSLQ Critical Thinking, Time and Study Environment, Metacognitive Self-Regulation, and Rehearsal scales along with high school GPA.

To the extent that this sample represents students at the university and the History 180 course can be compared to other general education courses, it may be wise for the faculty and administrators interested in enhancing student success at this university to turn their attention to: improving students’ self-efficacy; decreasing students’ test anxiety; cultivating student’s sense of value in the learning task; and developing students’ ability to think, choose study environments and use time wisely, submit concepts to memory, and employ metacognitive processes to self-regulate their learning. Attending to these factors can become a model for increasing student success at this university.

Such a model of student support would reflect Flavell’s (1979) and Thomas’s (1978) early conclusions that metacognition is as important as cognition. Students must not only be able to think well, but they must also be able to plan, monitor and adjust their thinking. In fact, Flavell (1979) theorized that it is metacognition that leads to the use of learning strategies. Further, both Pintrich (2004) and Zimmerman and Martinez Pons (1986) emphasized the role of Metacognitive Self-Regulation in learning, considering it one of the most
fruitful areas for further study. This study reinforces research showing that one of the ways successful students regulate their learning is by planning their time in order to have adequate time to study, keep up with reading and attend classes regularly (Tesser & Britton, 1991; Kitsantes et al., 2008; Zimmerman & Martinez Pons, 1986). In addition, setting aside a place to study where they can concentrate requires attention to the learning process.

This model also lends support to the idea that affect, i.e., beliefs and feelings, plays a role in learning. Although the only scale among 15 measuring a purely affective construct, the MSLQ’s Test Anxiety scale emerges as one of the most influential. The Learning Strategy scale most associated with affect is Effort Regulation in which a student continues to expend energy on learning despite feelings of boredom, lack of interest or laziness. The strong correlation found between Effort Regulation and an element of our emerging model, Time and Study Environment, both in this study and in early analyses of the MSLQ (Pintrich et al., 1991) may suggest that as students see the need for an adjustment to their internal environment or affect when feeling disinterested or bored, an adjustment in the external environment by planning a time and place for study serves to help them continue in the learning task.

Furthermore, the fact that Self-Efficacy for Learning and Performance and Metacognitive Self-Regulation both surface as meaningful to a student’s success is not surprising considering the links between these constructs uncovered in early research by Pintrich & DeGroot (1990) and Pintrich & Garcia (1994). In fact,
the mix of scales represented in the model reflects the complexity of the task McKeachie and Pintrich undertook in developing an instrument that could measure constructs relevant to college student learning. As shown in Table 23, the emerging model of significant predictors of success for students in this study includes one scale from each category of scales on the MSLQ.

The key point of the theory that makes research using the MSLQ so valuable is that the constructs it measures, unlike personality or IQ, can be altered. If self-efficacy were a stable construct that students possessed at all times and in all situations to the same degree, the best response to this finding if we wanted our students to be successful would be to measure students’ self-efficacy, get a general idea how well they would do, and see if they could succeed even when the probability seems low that they will do so. Similarly, if the ability to think critically were a quality one possessed in a particular measure for all time, we could expect that those who possessed it to greater measure would do better in coursework while those who had less would struggle. However, students can learn what motivates them; they can learn how to learn.

In fact, as we have seen, the MSLQ was developed as a way of measuring the learning that was occurring in a Learning to Learn course taught at the University of Michigan. In this course, McKeachie and Pintrich (McKeachie, Pintrich & Lin, 1984) were interested in helping students understand the psychological theories underlying success in learning. They wanted the students
Table 25

MSLQ Scale Categories and Corresponding Elements of Emerging Model

<table>
<thead>
<tr>
<th>MSLQ Category</th>
<th>Scale Included in Emerging Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td></td>
</tr>
<tr>
<td>Value Components</td>
<td>Task Value</td>
</tr>
<tr>
<td>Expectancy Components</td>
<td>Self-Efficacy for Learning and Performance</td>
</tr>
<tr>
<td>Affective Components</td>
<td>Test Anxiety</td>
</tr>
<tr>
<td>Learning Strategies</td>
<td></td>
</tr>
<tr>
<td>Cognitive Strategies</td>
<td>Critical Thinking</td>
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<tr>
<td></td>
<td>Rehearsal</td>
</tr>
<tr>
<td>Metacognitive Strategies</td>
<td>Metacognitive Self-Regulation</td>
</tr>
<tr>
<td>Resource Management Strategies</td>
<td>Time and Study Environment</td>
</tr>
</tbody>
</table>

not only to employ learning strategies but also to understand why these strategies worked. This experience led to the “the firm conviction that learning strategies can be taught” (p. 9), the discovery that students struggling with test anxiety were helped by being taught effective strategies, and the conclusion that students could use the learned skills in multiple courses. Since that time, much more has been learned regarding how to develop self-efficacy, decrease test anxiety, and develop critical thinking and other academic skills. It is time to apply that knowledge.

Implications and Recommendations

The stated intent of this study was to provide information to the university’s administrators, instructors, advisors, and student development professionals concerning how to achieve their goal of increasing student success and retention by supporting students’ development of beliefs and skills
necessary for that success and for persistence toward a college degree. Because significant outcomes were obtained from testing the hypotheses, the researcher was better able to develop student support strategy recommendations. The data analyses pointed to seven factors that seem most relevant to a student’s success in a general education course at the university. These seven factors can form a model that upon recommendation to university personnel may be useful in improving student success and retention.

For the university in question, the model for student success that emerges is one that includes 1) increasing self-efficacy; 2) decreasing test anxiety; 3) cultivating value for the learning task; 4) developing critical thinking skills, 5) teaching students to plan, monitor and control their own learning; 5) equipping students to store concepts and definitions in memory for later access and application; 6) helping students understand the importance of and providing them with strategies for planning and using their time; and 7) helping students understand the importance of and providing them with options for optimal study environments. Upon ordering these components according to their relative influence on student achievement (as indicated by the beta coefficients obtained in the regression analysis) and considering the correlation statistics of these components with others measured in the study, the relationships discovered can be represented graphically as shown in Figures 4 and 5.
Motivation for College Success Model

Figure 4 proposes a Motivation for College Success Model. The three motivational constructs emerging from the regression analysis as most influential in predicting student achievement—Task Value, Self-Efficacy and Text Anxiety—are represented with large ovals. The size of the ovals is roughly proportional to the beta coefficients obtained as a measure of each component’s relative ability to predict final course grade and the correlation of that construct with final course grade. Other motivational constructs that have a significant correlation of greater than .3 with one or more of the three main constructs are represented in the model by rectangles. The correlation between two constructs is represented by a two-way arrow.

The meaning of the model can be understood as follows. As a student begins a learning task, that student has some level of interest in the task. In other words, that task is valued by the student in some way (Task Value). The greater this interest in the task, the more likely that student is to undertake the task out of a desire to engage in the task itself (higher Intrinsic Goal Orientation) and the stronger might be that students’ belief that success will result from effort expended (higher Control of Learning Beliefs). Conversely, if a student has low interest in the task, that student would be more likely to undertake the task in order to obtain an external reward (lower Intrinsic Goal Orientation) and to believe that success would relate to luck, the student’s own ability, or the difficulty of the task itself (lower Control of Learning Beliefs). Another way to
Student Success

Intrinsic Goal Orientation

Extrinsic Goal Orientation

Test Anxiety

Self-Efficacy for Learning and Performance

Task Value

Control of Learning Beliefs (Attribution)

Figure 4: Motivation for College Success Model
conceptualize this is that when a student values a task and has interest in it, that student feels connected to the task. The task is connected to the student because it relates to her interests and goals and because the student believes she can master it through effort. On the other hand, when a student does not value the task, the task feels disconnected from the self, the task does not relate to personal goals and the student believes success at the task is out of his or her control.

All three of these contracts—Task Value, Intrinsic Goal Orientation, and Control of Learning Beliefs—combine to influence the sense of Self-Efficacy for Learning and Performance experienced by a student. When the student is interested in the learning task (Task Value) for its own sake (Intrinsic Goal Orientation) and believes that his success hinges on trying his best (Control of Learning Beliefs), the connection the student feels to the task increases with his sense that he is competent to undertake it (Self-Efficacy for Learning and Performance). The closer that connection, the more efficacious the student will believe himself to be.

Self-Efficacy for Learning and Performance is most closely related to the level of success a student achieves. But this achievement is mediated by the level of Test Anxiety that she experiences. The confidence that accompanies high Self-Efficacy seems to lessen Test Anxiety (Bembenutty, 2009). The level of Test Anxiety the student experiences, however, is not only influenced by his Self-Efficacy but also his Extrinsic Goal Orientation. The more he is motivated by
external rewards such as grades, recognition by others, or another external factor, the more Test Anxiety he is likely to experience.

The final measure of success on the task is a result of this complex interplay of interest, goal orientation, attribution, and self-efficacy. Because student success is the ultimate goal (or target) of the educator, it is represented by a yellow circle in the model. The intent of the Motivation for College Success model proposed here is to assist the educator in understanding how the constructs examined in this study may interact with one another to influence a student’s success.

This model can be illustrated by a description of a hypothetical student named Ted, a freshmen taking an introductory Biology class. Ted is a pre-med major so he highly values the learning tasks of the course. He wants to be a doctor, but not because his parents are pressuring him or to prove himself. Instead, this desire stems from having had a friend in grade school that had cancer and he wants to learn how to help people who have diseases. Thus, he has an intrinsic goal orientation. Because his parents and teachers have consistently encouraged him to do his best and put forth his best effort in school, he attributes success to effort—not ability or luck. He would score high on the Control of Learning Beliefs scale. Further, he believes he will do well in the course because he did well in high school biology. In addition, his uncle, who is a doctor, has told him he has a knack for the sciences and could see Ted be successful in medicine. Thus, Ted has high self-efficacy. Like most students
who are high in self-efficacy, Ted is low in test anxiety. He has had experiences of success in test-taking and believes there is little reason to be anxious. His goal in learning is strongly intrinsic so he has less to fear if he does poorly; he wants to master the material to make a difference and help people not to get an A or look good to others. Such a student as Ted would be set up for success.

But, not all students resemble this description. In fact, most of them do not. However, advisors or instructors possessing both an understanding of where their students would fall on these motivation scales and a knowledge of strategies that can enhance student motivation would be more able to assist those students toward success. Toward this end, assessing students’ levels of task value, self-efficacy and test anxiety and equipping faculty with strategies to build the first two and lessen the latter would be recommended.

Strategies for College Success Model

Similarly, the researcher analyzed the beta coefficients and correlation statistics obtained in this study for the Learning Strategies Scales and has attempted to graphically represent these relationships in the Strategies for College Success Model as shown in Figure 5. In this model, the three Learning Strategies with significant beta coefficients in the regression analysis—Time and Study Environment, Metacognitive Self-Regulation, and Critical Thinking—are represented as large ovals. The size of each oval relative to the others is roughly proportionate to the size of the beta coefficient for that construct, thus
representing the relative influence of the learning strategy on a student’s final course grade. Other learning strategies with a strong (.7 or higher) or moderately strong (.6 or higher) correlation with Time and Study Environment, Metacognitive Self-Regulation or Critical Thinking are represented in boxes and the correlation is represented with a two-way arrow.

The strongest correlation between MSLQ scales found in this study was between Effort Regulation and Time and Study Environment (.772). The second strongest correlation with Time and Study Environment was with Metacognitive Self-Regulation (.665). Metacognitive Self-Regulation was significantly correlated (at a value between .513 and .745) with all eight of the other Learning Strategies. To avoid the model becoming too cumbersome, only the top five of these correlations is represented in the model. Metacognitive Self-Regulation correlated most strongly with Elaboration (.745) followed by Critical Thinking (.728), Organization (.695), Time and Study Environment (.665) and Rehearsal (.638). The strongest correlations for Critical Thinking, in turn, were with Metacognitive Self-Regulation (.728) followed by Elaboration (.658), Organization (.438), Peer Learning (.434), Time & Study Environment (.405) and Rehearsal (.401). Because the three remaining cognitive strategies—Elaboration, Organization, and Rehearsal—although not having a significant beta coefficient,
Figure 5: Strategies for College Success Model
were strongly intercorrelated (with values of .580, .609 and .713), they are grouped together in one box in the model.

A proposed conceptual understanding of the interaction of these learning strategies follows. The more a student believes that the effort expended on a learning task despite feelings of boredom or laziness will influence the outcome of that task (Effort Regulation), the more that student will dedicate time to the learning task and seek an environment in which she can best study (Time and Study Environment). Conversely, the less attention the student pays to expending effort on the task, the less he will be motivated to spend time on the task and find an environment conducive to study.

To the extent that time and environment are managed in such a way that the student can study, that student will adapt, plan, monitor, and control the strategies used in that time and place (Metacognitive Self-Regulation). The more the student regulates his learning the more he will choose and use effective study strategies such as Elaboration, Organization, and Rehearsal to grasp the content he is seeking to learn. The more this content is absorbed, the more the student is able to think critically about it, evaluating it and comparing it to other known ideas and concepts (Critical Thinking). The more Critical Thinking that occurs during study, the greater that student’s achievement (Student Success). In summary, what this model proposes is that the more the student sets aside time and space for learning, the more the student is able to monitor and adapt her use
of cognitive study strategies that allow her to grasp the concepts to be learned, think critically about them, and succeed in the learning task.

Here again a hypothetical student will be described to enhance understanding of the model. Kim is an art major who is taking a required history course. Kim knows the importance of managing her time in college and finding a good location for studying. She has a calendar on her phone where she blocks out major chunks of time to study for the class. She knows this is necessary because her art projects are very time consuming so she needs to manage her time well so everything gets done. She has a study carrel in the library that she calls her own. She knows she needs to keep pressing on even when the material seems boring or she feels lazy so she has a way of rewarding herself after each hour of study (five minutes on Facebook). This is Effort Regulation. When she is in her study carrel, Kim intentionally uses learning strategies she was taught in high school. She connects the material with things she knows—movies she’s watched about the time period, people in her family that would have been alive in the time period being studied. This is the learning strategy of Elaboration. She also uses the strategy of Organization by drawing timelines for each decade with pictures to symbolize the main events. She also creates flashcards of various dates and important people and places and uses these to store the material in her memory, thus employing the learning strategy of Rehearsal. As she does this she monitors how much she is learning—how many right on the flashcard self-test? Did I just review a whole page of notes
and not remember anything?--and changes strategies if needed in order to
master the material. This is Metacognitive Self-Regulation. As she studies the
material she begins to evaluate it--what if that event had not happened? Why
would a particular person be drawn to do what s/he did? Isn’t the textbook
biased toward a particular view of the events? This is Critical Thinking. She jots
questions in the margins of her notes to ask the teacher or friends at another
time. Not surprisingly, Kim enjoys a high level of success.

Here again, our hypothetical student presents an ideal situation.
However, to help each student, instructors and advisors need to assess students’
use of learning strategies and be prepared to teach students how to learn.

Connection Point for Models

While the relationship between the Motivation Scales and the Learning
Strategies Scales was not analyzed in this study nor were the two sets of scales
compared to one another, one can speculate concerning a connection between the
Motivation for College Success Model and the Learning Strategies for College
Success Model. There would seem to be a connection between Control of
Learning Beliefs, a component of the Motivation model, and Effort Regulation, a
component of the Learning Strategies model. Because Control of Learning
Beliefs refers to the extent that a student attributes success in a learning task to
his effort, the only attribution that is under his control, this may influence the
degree to which that student is willing to regulate that effort and thus activate the remaining learning strategies related to college success.

The Motivation for College Success Model and the Learning Strategies for College Success Model proposed here would benefit from further testing and confirmation of their validity. However, they are offered as tools to assist educators at the study site to understand the ways their students are motivated and the learning strategies most relevant to their students’ success.

For example, with the role of Task Value in a student’s level of engagement and success in the learning task in mind, an instructor could seek ways to discover his students’ interests (e.g., via a short questionnaire during the first class meeting) and use examples when lecturing or design assignments that connect to those interests. Likewise, knowing the relationship between a student’s level of Self-Efficacy and their performance in the course, a tutor or academic advisor interested in helping a student be successful could affirm student achievements no matter how small—a correctly-answered question, a concept grasped and clearly explained, or a practice quiz passed. Realizing the influence of Test Anxiety on student outcomes, counselors or student affairs staff could design workshops and seminars for students, offering practical methods to lessen students’ nervousness during exams and quizzes.

Similarly, university faculty and staff could translate an understanding of those learning strategies most meaningful to their student’s success into daily practice. For example, faculty development sessions for professors and
instructors could focus on instructional methods that are most effective in developing a student’s capacity for Critical Thinking. Course delivery methods and assignments could be modified based on this new knowledge. An acknowledgement of the importance of a student’s management of their Time and Study Environment could be shown through informing and equipping students with these skills in new student orientation or freshman seminar programs. Moreover, the design of residence hall, library, and student center spaces can promote a student’s ability to find and use those spaces most conducive to studying. Finally, Metacognitive Self-Regulation is best done when a student is aware of a variety of strategies and practices that can aid her in successfully completing a learning task. For this reason, a Learning to Learn course at the university or incorporating a Learning to Learn unit in the freshman seminar course would be a valuable addition to staff and faculty’s efforts to help students achieve.

The purpose of this study was to investigate the pattern of motivational, cognitive, and academic beliefs and skills students bring to or develop during their first year of college at a private, liberal arts university in the Midwest, and examine if and how these patterns differ between freshmen and sophomores co-enrolled in sections of the same course. The intent was to provide valuable information to that university’s administrators, instructors, advisors, and student development professionals concerning how to achieve their goal of increasing student success and retention by supporting students’ development of beliefs
and skills necessary for that success. We believe that this exploratory study made substantial progress towards that goal.

Suggestions for Future Research

Research that would build upon the current study would include repeating the study comparing sophomores with juniors or juniors with seniors. While finding a general education course with adequate numbers of upper division students in them may prove difficult, it would be interesting to see how motivational levels and use of learning strategies develop and change as traditional-aged students move through their college years.

Another fruitful path for future research would be to analyze the current data for correlations between motivation and use of learning strategies. For the current study, only the scales in one of the categories—Motivation or Learning Strategies—were compared.

The researcher in this study chose to include high school GPA as a variable in the multiple regression in order to emphasize its importance in predicting a college student’s future success. Personnel working to help students succeed should be aware that students with weaker high school GPAs may be more in need of their intervention. However, future studies excluding the high school GPA from the analysis could shed more light on how motivation alone or the use of learning strategies alone influence student success.
Moreover, many possible directions for further research can be found in the observations made in response to Research Question 1. This, exploratory question resulted in finding some interesting patterns in the sample studied. Why were freshmen means higher than sophomores mean on most of the learning strategy scales while sophomores means were higher than those of freshmen on most of the motivation scales? Why were freshmen higher in Control of Learning Beliefs? Why did sophomores score higher in the use of Organization?

Methodologically, future researchers could take a different approach in scoring the MSLQ, perhaps leading to different, more useful data. The researcher in this study chose to follow the procedures laid out in the MSLQ Manual (Pintrich et al., 1991) and calculate the mean scale score for each participant rather than using a raw score, that is, the total of a participant’s response scores for the scale. The greater variability of raw score data may yield more detailed and possibly different findings.

More research could also be conducted on methods that increase students’ sense of value for a task, enhance their self-efficacy, and lessen their test anxiety, as these appear to be critical to student success. Likewise, future research could explore the best methods for teaching learning strategies to students, emphasizing management of time and the study environment, metacognitive self-regulation and thinking critically.
Conclusion

Anyone concerned with the true goal of higher education, helping students master the content of their courses, and not simply keeping seats filled and doors open, will always have work to do. The complexity of the human person combined with the search for ways to maximize the learning potential of each student is an un-ending and fascinating challenge. Understanding students’ motivation and learning and how these complex constructs develop and change during the college years is an important part of knowing how to help them succeed, not only in attaining a degree but also in becoming a lifelong learner.
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248


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APPENDICES
APPENDIX A

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE
Consent Form

Thank you for participating in this study! Please read through the important information below and indicate your understanding and consent to participate.

Risks & Benefits of Participation: There are no known physical or emotional risks to you if you complete this questionnaire. There is no monetary cost involved in participating. Valuable information can be obtained by conducting this research. By completing the questionnaire, you as a college student may become more aware of your own learning skills, and we as instructors and researchers may better know how to help you learn and understand your courses.

Anonymity: Your responses are anonymous and will be kept in a secure computer file. You will be identified by a research number only in taking this survey and in all related data that is collected from university records.

Participation: Your participation is voluntary and you have the right to withdraw from the study at any time.

Questions about the Study: For any further information regarding this research study, please feel free to contact me, Stephanie Santorosa, at 768-677-2147 or my research adviser, Dr. Catharine Knight, at knight@userv.edu.

I have had an opportunity to read the above information and ask questions about this research project. I will cooperate freely in this research project and release any claim to the collected data, research results, publication or commercial use of such information or products resulting from the collected information. I understand that if I have questions about my rights as a research participant, I can contact Indiana University’s Institutional Review Board at 765-677-2090.

Part A: ID Number

Please enter your WU Student ID Number in the box below. (Note: To protect your anonymity, at no time will your ID number be connected to your name but without this number your questionnaire will be invalid.)

Part B Instructions

The statements in this section ask you to rate your motivation for and attitudes about History 180. There are no right or wrong answers, simply answer as accurately as possible. Use the 1-7 scale to respond to each statement. If you think the statement is very true of you, select “7.” If a statement is not at all true of you, select “1.” If the statement is more or less true of you, find the number between 1 and 7 that best describes you in relation to that statement.

There are 31 statements in this section. If you miss one, you will be alerted with a message asking you to respond to the missed statement.

Part B: Motivation (Questions 1-31)

1. In a class like this (History 180), I prefer course material that really challenges me so I can learn new things.

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2. If I study in the appropriate ways, then I will be able to learn the material in this course (History 180).

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3. When I take a test, I think about how poorly I am doing compared with other students.

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4. I think I will be able to use what I learn in this course in other courses.

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5. I believe I will receive an excellent grade in this class.

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6. I'm certain I can understand the most difficult material presented in the readings for this course.

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7. Getting a good grade in this class is the most satisfying thing for me right now.

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8. When I take a test, I think about items on other parts of the test I can't answer.

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9. It is my own fault if I don't learn the material in this course.

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10. It is important to me to learn the course material in this class.

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11. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.

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12. I'm confident I can learn the basic concepts taught in this course.

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13. If I can, I want to get better grades in this class than most of the other students.

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14. When I take tests, I think of the consequences of failing.

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15. I'm confident I can understand the most complex material presented by the instructor in this course.

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16. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.

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17. I am very interested in the content area of this course.

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18. If I try hard enough, then I will understand the course material.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

19. I have an uneasy, upset feeling when I take an exam.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

20. I'm confident I can do an excellent job on the assignments and tests in this course.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

21. I expect to do well in this class.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

22. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

23. I think the course material in this class is useful for me to learn.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

24. When I have an opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.
Not at all true of me (1) (2) (3) (4) (5) (6) (7) Very true of me
0 0 0 0 0 0 0

25. If I don’t understand the course material, it is because I didn’t try hard enough.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

26. I like the subject matter of this course.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

27. Understanding the subject matter of this course is very important to me.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

28. I feel my heart beating very fast when I take an exam.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

29. I’m certain I can master the skills being taught in this class.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

30. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

31. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.

Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

Part C Instructions

The next set of questions ask about the learning strategies and study skills you use in History 180. Again, there are no right or wrong answers. Respond to the statements as accurately as possible using the same scale as questions 1-31.

There are 50 statements in this section. If you miss one, you will be alerted with a message asking you to respond to the missed statement.

32. When I study the readings for this course, I outline the material to help me organize my thoughts.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

33. During class time, I often miss important points because I'm thinking of other things.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

34. When studying for this course, I often try to explain the material to a classmate or friend.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

35. I usually study in a place where I can concentrate on my course work.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

36. When reading for this course, I make up questions to help focus my reading.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

37. I often feel so lazy or bored when I study for this class that I quit before I finish what I had planned to do.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

38. I often find myself questioning things I hear or read in this course to decide if I find them convincing.
Not at all true of me (1) (2) (3) (4) (5) (6) Very true of me (7)

30. When I study for this class, I practice saying the material to myself over and over.

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40. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone.

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41. When I become confused about something I’m reading for this class, I go back and try to figure it out.

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42. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

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43. I make good use of my study time for this course.

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44. If course readings are difficult to understand, I change the way I read the material.

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45. I try to work with other students from this class to complete the course assignments.

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46. When studying for this course, I read my class notes and course readings over and over again.

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47. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

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48. I work hard to do well in this class even if I don't like what we are doing.

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49. I make simple charts, diagrams, or tables to help me organize course material.

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50. When studying for this course, I often set aside time to discuss course material with a group of students from the class.

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51. I treat the course material as a starting point and try to develop my own ideas about it.

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52. I find it hard to stick to a study schedule.

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53. When I study for this class, I pull together information from different sources, such as lectures, readings and discussions.

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54. Before I study new course material thoroughly, I often skim it to see how it is organized.

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Not at all true of

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<thead>
<tr>
<th>Question</th>
<th>Not at all true of me</th>
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<th>(5)</th>
<th>(6)</th>
<th>Very true of me</th>
<th>(7)</th>
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</thead>
<tbody>
<tr>
<td>55. I ask myself questions to make sure I understand the material I have been studying in this class.</td>
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<td>56. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.</td>
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<td>57. I often find that I have been reading for this class but don't know what it was all about.</td>
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<td>58. I ask the instructor to clarify concepts I don't understand well.</td>
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<td>59. I memorize key words to remind me of important concepts in this class.</td>
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<td>60. When course work is difficult, I either give up or only study the easy parts.</td>
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<td>61. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.</td>
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62. I try to relate this subject to those in other courses whenever possible.

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<th>Not at all true of me (1)</th>
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<th>Very true of me (7)</th>
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63. When I study for this course, I go over my class notes and make an outline of important concepts.

<table>
<thead>
<tr>
<th>Not at all true of me (1)</th>
<th>(2)</th>
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64. When reading for this class, I try to relate the material to what I already know.

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<th>Not at all true of me (1)</th>
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65. I have a regular place set aside for studying.

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<th>Not at all true of me (1)</th>
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66. I try to play around with ideas of my own related to what I am learning in this course.

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<th>Not at all true of me (1)</th>
<th>(2)</th>
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67. When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.

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<thead>
<tr>
<th>Not at all true of me (1)</th>
<th>(2)</th>
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<th>Very true of me (7)</th>
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68. When I can't understand the material in this course, I ask another student in this class for help.

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<thead>
<tr>
<th>Not at all true of me (1)</th>
<th>(2)</th>
<th>(3)</th>
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69. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

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<thead>
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<th>Not at all true of me (1)</th>
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70. I make sure that I keep up with the weekly readings and assignments for this course.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

71. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

72. I make a list of important items for this course and memorize the lists.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

73. I attend this class regularly.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

74. Even when course materials are dull and uninteresting, I manage to keep working until I finish.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

75. I try to identify students in this class whom I can ask for help if necessary.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

76. When studying for this course, I try to determine which concepts I don’t understand well.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

77. I often find that I don’t spend very much time on this course because of other activities.
Not at all true of me (1) ☐ (2) ☐ (3) ☐ (4) ☐ (5) ☐ (6) ☐ (7) ☐

78. When I study for this class, I set goals for myself in order to direct my activities in each study period.

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<th>Not at all true of me (1)</th>
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79. If I get confused taking notes in class, I make sure I sort it out afterwards.

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80. I rarely find time to review my notes or readings before an exam.

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<th>Very true of me (7)</th>
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</table>

81. I try to apply ideas from course readings in other class activities such as lecture and discussion.

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<thead>
<tr>
<th>Not at all true of me (1)</th>
<th>(2)</th>
<th>(3)</th>
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Part D: Demographic Information

Gender:

- Male
- Female

What year did you graduate from high school?

- 2010
- 2009
- 2008
- 2007
- Before 2007
- Not yet graduated

Number of college credits completed:
- 0-29 (Freshman)
- 30-59 (Sophomore)
- 60-89 (Junior)
- 90+ (Senior)

Race:
- African-American/Black
- Asian-American
- Caucasian/White
- Latino/Latina
- Multiracial
- Other

Mailbox Number

Please enter your RAU campus mailbox number. A report of your scores, accompanying study tips based on those scores, and a $1 coupon for McConnell Coffee will be sent to your mailbox. Your mailbox number will also be entered in a drawing for one of two $75 cash prizes to be awarded at completion of the study. If your mailbox number is drawn, you will be sent a note describing how you can claim your prize.

THANK YOU FOR PARTICIPATING!

APPENDIX B

PARTICIPANT ACKNOWLEDGEMENT LETTER AND COUPON
January 31, 2011

IWU student #  
Mailbox #0

Dear IWU Student,

This past week you completed a questionnaire called the Motivated Strategies for Learning Questionnaire (MSLQ). The purpose of this questionnaire was to gather some information about your study habits, your learning skills, and your motivation for college coursework. As promised, I am providing you with feedback from the MSLQ on your study habits, learning skills and motivation. The enclosed feedback form provides your scores and describes how to interpret them.

This feedback is intended to help you determine your own strengths and weaknesses as a student. It does not compare your scores to others. You may want to use this feedback to do something about changing your study skills or motivation. All of the motivational and study skills mentioned on your feedback form are learnable. This is an important idea to remember, especially in college. You can decide whether you want to change these aspects of your learning style. I’ve provided some suggestions for improvement to go along with each scale. I hope you find these suggestions helpful. But keep in mind that these are not the only ways to improve each area. You may want to seek additional help at the Center for Student Success, located on the second floor of the Student Center next to the Health Center.

Also enclosed with this letter is a $1 coupon that you can use at McConn Coffee anytime between now and April 2011. Your mailbox number has also been entered in a drawing for a $75 cash prize. If your mailbox number is drawn, you will receive a note in your campus mailbox with the news and only at that time will you need to identify yourself to claim your prize.

A sincere thanks for participating in my research. Your participation has brought me one step closer to completing my doctoral degree and has helped me learn more about college students’ motivation and strategies for learning. I hope the enclosed feedback form also becomes a useful tool for you in becoming a better learner.

I wish you all the best in your studies! It is my prayer that the skills you learn, the character you develop and the relationships you build during your time at IWU will equip you for a lifetime of serving God and your neighbors in real and meaningful ways.

Grace & peace,

Stephanie Santarosa
Doctoral Candidate, University of Akron
APPENDIX C

SAMPLE MSLQ SCORE REPORT FOR STUDY PARTICIPANT
Motivated Strategies for Learning Questionnaire (MSLQ) Feedback Form

**How to interpret your scores:** All the responses on the MSLQ are based on a seven point scale. Although some items were worded negatively, we have reversed these questions so that in general, a higher score such as a 4, 5, 6, or 7 is a better than a lower score like a 1, 2, or 3. The only exception is the test anxiety scale, where a high score means more worrying during and about tests and exams.

In general, if your scores are above 3 (or below 4 on the Test Anxiety scale), then you are doing well in that area. If you are below 3 on more than six of the nine scales, you may want to seek help from your instructor or the Center for Student Success.

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<thead>
<tr>
<th>Participant ID #:</th>
<th>Mailbox #: 0</th>
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<tbody>
<tr>
<td><strong>I. Motivation: Interest</strong></td>
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<tr>
<td>This is a measure of how interested you are in the material being covered in this course. A high score means you like the subject matter and are very interested in the content area of this class.</td>
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<tr>
<td><strong>To Improve in this area:</strong></td>
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<tr>
<td>skim the table of contents of the class textbook or take a look at the course syllabus and make a list of the three topics that most interest you and the three topics that least interest you. Pay particular attention to these topics. What is it about the three most interesting topics that makes you like them so much? What is it about the other three topics that makes them uninteresting? Can you find any of the characteristics of the three most interesting topics in the three least interesting topics? If you identify what it is about the three most interesting topics that makes you like them so much, you may be able to apply what you found to the three least interesting ones, and perhaps you’ll find that those uninteresting topics aren’t so uninteresting after all</td>
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<tr>
<td><strong>Your score:</strong></td>
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<td>5.0</td>
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| **II. Motivation: Expectancy for Success** |
| This is a measure of your perceptions of your potential success in this course and of your self-confidence for understanding the course content. A high score means that you think you will do well in the course, and feel confident that you will be able to master the course material. |
| **To Improve in this area:** |
| Evaluate your current approach to a course assignment from different points of view. For example, describe the effectiveness and ineffectiveness of your own approach from your own perspective. Then imagine how a classmate might evaluate your approach. By analyzing the way you are tackling an assignment, you may be able to figure out what you’re doing right and what you’re doing wrong and can change your approach. A better understanding of the way you learn, what works and what doesn’t work, may help increase your confidence in doing well in this course. |
| **Your score:** |
| 6.3 |

<p>| <strong>III. Test Anxiety</strong> |
| This is a measure of how much you worry about tests and how often you have distracting thoughts when you take an exam. In contrast to the other scales, a high score here means that you are anxious in testing situations. |
| <strong>To Improve in this area:</strong> |
| Developing better study skills usually results in less anxiety. Prepare well for class and try to complete assignments on time. Try not to wait until the last minute to get things done or to get ready for an exam. Doing this should help build your confidence at test time and hopefully reduce test anxiety. When taking a test, concentrate on one item at a time, and if you’re stumped on a question, move on and go back to the question later. Remind yourself that you’ve prepared well and if you can’t answer some questions, it’s okay; you’ll still be able to answer the others. |
| <strong>Your score:</strong> |
| 3.0 |</p>
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<tr>
<th>IV. Cognitive Strategy: Rehearsal</th>
<th><strong>Your score:</strong></th>
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<tr>
<td>This scale is a measure of how often you use study strategies such as rereading class notes and course readings and memorizing list of key words and concepts. A high score means you use these strategies fairly often.</td>
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<td><strong>To improve in this area:</strong></td>
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<tr>
<td>List the important terms and topics in the course. Define them and repeat them aloud. Break up that list into smaller lists that are made up of closely related items. Make up images or rhymes to help you remember those lists. Generate test items to help you measure your recall.</td>
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<tr>
<th>V. Cognitive Strategy: Elaboration</th>
<th><strong>Your score:</strong></th>
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<tr>
<td>This scale reflects how often you attempt to summarize or paraphrase (put into your own words) the material you read in your textbooks, and how often you try to relate the material to what you already know or have learned. A high score means that you use these strategies fairly often. These strategies usually result in better performance than rehearsal strategies.</td>
<td>5.8</td>
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<td><strong>To improve in this area:</strong></td>
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<tr>
<td>Paraphrase and summarize important information. Use your own words to describe the material covered during lecture or in assigned reading. Pretend you're the teacher and are trying to explain the topic to students! Try to figure out how each topic relates to each other. What are the connections between what you’ve heard in lecture, talked about in discussion, or read in the book?</td>
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<tr>
<th>VI. Cognitive Strategy: Organization</th>
<th><strong>Your score:</strong></th>
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<tr>
<td>This scale refers to your ability to select the main ideas from you readings as well as your attempts to organize and put together what you need to learn in this course.</td>
<td>6.5</td>
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<tr>
<td><strong>To improve in this area:</strong></td>
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<tr>
<td>Outline course material and identify where the text and lecture overlap and don’t overlap. This will give you a starting point in developing connections between ideas presented in two different contexts. Make charts, diagrams, or tables of the important concepts. Something like a flowchart or a tree diagram is usually very helpful in trying to understand how different ideas &quot;go together.&quot;</td>
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<tr>
<th>VII. Metacognition</th>
<th><strong>Your score:</strong></th>
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<tbody>
<tr>
<td>This is a measure of how often you think about what you are reading or studying as you do your coursework. For example, do you monitor your attention while you read or do you often find that you have read 10 pages in your textbook and can’t remember anything about it? Do you adjust your reading speed if you are reading something difficult in comparison to reading the newspaper? A high score means that you try to plan your work and check on whether you understand the course material.</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>To improve in this area:</strong></td>
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<tr>
<td>Skim the reading material before you begin to see how it is organized. Look at the headings and subheadings of the text to give yourself an idea of how things are related to each other. While reading, ask yourself questions about the paragraph you have just read and scribble key words in the margins of the book or in a notebook. Try to determine which concepts you don’t understand well. Although this method takes longer initially, you are more likely to remember what you have read. This saves you time later when studying for a test.</td>
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<tr>
<td>VIII. Resource Management: Time &amp; Study Space</td>
<td>Your score: 5.8</td>
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<tr>
<td>This scale is a measure of how well you manage your time and schedule, and your use of a place to study. A high score means that you have a method for managing your schedule and you try to study somewhere where you can finish your coursework.</td>
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<tr>
<td>To improve in this area:</td>
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<tr>
<td>Keep track of what you do with your study time for a week. Write down your goals for each study period and then write down what you actually accomplished during that study period. Analyze the chart at the end of the week. You may want to change the place where you study, or the times when you study, or who you study with. Try to come up with a study schedule that works best for you.</td>
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<thead>
<tr>
<th>IX. Resource Management: Self-Effort</th>
<th>Your score: 6.3</th>
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<tbody>
<tr>
<td>This scale refers to your willingness to try hard on your coursework, even when the work is difficult. A high score means that you try hard and exert effort in your studying.</td>
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<tr>
<td>To improve in this area:</td>
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<tr>
<td>Keep a list of the topics that you find yourself procrastinating instead of studying for. Try to analyze why you postpone studying these topics by discussing them with other students. Talking with them may lead you to consider an approach that may help you act more quickly instead of delaying studying the material.</td>
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APPENDIX D

EMAIL COMMUNICATION TO REQUEST PARTICIPATION
Dear IWU Student:

You may recognize my name as an IWU administrator but I'm writing now as a doctoral student. I'm working toward a Ph.D in Education from the University of Akron and am currently collecting data for my dissertation. I am studying how college students think and use learning and motivation study skills. As a result, I am requesting your help by completing a questionnaire that will help us learn about these skills. To participate in the survey, please click on the link below. The questionnaire should take approximately 20 minutes to complete.

I'm studying motivation for learning but I'm also learning about motivation so here are four possible motivators for you to complete my survey and make it worth your time:
1) I'll send you a report of your scores with accompanying study tips that can help you become a better student
2) I'll send you a $1 coupon to McConn
3) I'll enter your mailbox number in a drawing for a $75 cash prize
4) I'll be deeply grateful and you'll have the joy of knowing you helped a graduate student complete her degree!

You will be asked to provide your IWU ID number (which will be used from this point forward to protect your anonymity) and your IWU campus mailbox number. You must complete the questionnaire and input your mailbox number to receive your coupon and score report and be entered in the drawing. Your participation is completely voluntary and your results will not be shared with your professor(s), parents, roommate, etc. Feel free to contact me should you have any questions.

Thank you for taking part in this survey!
Stephanie Santarosa

Follow this link to the Survey:
Take the Survey
<http://qtrial.qualtrics.com/WRQualtricsSurveyEngine/?Q_SS=4NGwar7tzd4PyFm_a3ufyrfl8ixCw2U&_=1>

Or copy and paste the URL below into your internet browser:
http://qtrial.qualtrics.com/WRQualtricsSurveyEngine/?Q_SS=4NGwar7tzd4PyFm_a3ufyrfl8ixCw2U&_=1

Follow the link to opt out of future emails:
http://qtrial.qualtrics.com/CP/Register.php?OptOut=true&RID=MLP_bPcV85mi0uSRdDS&LID=UR_eWKT3wXt13KJGo4&_=1
An invitation for IWU freshmen and sophomores enrolled in History 180...
...to participate in a research study
...to help add to knowledge about motivation and learning skills
...to get some feedback about your own motivation for learning and study skills
...to receive a $1 coupon for McConn and a chance to win $75 cash

Here’s how it works:
If you are a freshman or sophomore enrolled in History 180 this semester, you will receive an email sent to your campus account with the subject line “Link to Motivated Strategies for Learning Questionnaire.” Open the email, click on the link, and complete the questionnaire thoughtfully and thoroughly (should take approximately 20 minutes).

If you participate, you will receive:
- a report of your scores on the MSLO (Motivated Strategies for Learning Questionnaire) with accompanying study tips sent to the campus mailbox number you provide
- a $1 coupon for McConn Coffee good on any drink
- a chance to win one of 2 $75 cash prizes
- the joy of knowing you’ve helped a grateful doctoral student complete her dissertation

Important things to know before you participate:
- You must be a freshman or sophomore enrolled in History 180 this semester to participate.
- You must provide your university ID number for your questionnaire to be valid.
- Your individual responses will be completely anonymous. They won’t be shared with your professor, the university, your roommate, your parents...you will be identified only by a research number once you complete the questionnaire. The only time you would need to identify yourself is if you win a $75 cash prize so that I can give it to you!
- Your participation is entirely voluntary and you can change your mind about participating at any time.
- Your questions are always welcome. Contact me (Stephanie Santarosa) at x2747 or my research advisor (Dr. Catharine Knight) at knight@uakron.edu.

*Watch for an email with the link to the survey*
*Take 20 minutes to complete it*

Your participation is deeply appreciated!
APPENDIX F

REMINDERS OF REQUEST TO PARTICIPATE
For your Chance to Win $75...
Click on the link below and spend 20 minutes completing the Motivated Strategies for Learning Questionnaire.
Once 100 freshmen and 100 sophomores enrolled in History 180 have responded to the survey, the mailbox numbers of those who have participated will be entered in a drawing for a $75 cash prize.

If you complete the questionnaire, you will also receive...
*a report of your scores with accompanying study tips sent to the campus mailbox number you provide *a $1 coupon good on any drink at McCorn *the joy of knowing you've helped a grateful doctoral student complete her dissertation!

You should know before you participate...
you will remain anonymous—your responses will be not be connected with your name *your participation is completely voluntary and will not impact your grade in the course or status at the university in any way *you must be an IWU freshman or sophomore enrolled in History 180 to participate

THANKS FOR YOUR TIME! I HOPE YOU WILL PARTICIPATE!

Follow this link to the Survey:
Take the Survey
http://otrial.qualtrics.com/WRQQualtricsSurveyEngine/?Q_SS=4NG9war7Tzd4PyFm_a3ufyrf8EcCw2U8=_1

Or copy and paste the URL below into your internet browser:
http://otrial.qualtrics.com/WRQQualtricsSurveyEngine/?Q_SS=4NG9war7Tzd4PyFm_a3ufyrf8EcCw2U8=_1

Follow the link to opt out of future emails:
http://otrial.qualtrics.com/CP/RRegister.php?OptOut=true&RId=MLRP_bPvBcn0uSRdDS&UID=UR_eWKT3wX193KICod8=_1
Santarosa, Stephanie

From: noreply@qemalisever.com on behalf of Stephanie Santarosa <noreply@qemalisever.com>
Sent: Wednesday, February 02, 2011 1:09 PM
To: Santarosa, Stephanie
Subject: Celebrate the Snow Day—take a survey and earn a free cup of coffee!

Hello!
I hope you are enjoying the snow day! Why not use some of your extra minutes to click on the link below and complete the Motivated Strategies for Learning Questionnaire? I need 25 more responses and once I get them can hold the drawing for the $75 cash prize. Everyone who completes the survey and provides their mailbox number at the end will receive a report of their scores with accompanying study tips and a $1 coupon to McGraw. I hope you will participate!

Stephanie Santarosa

Follow this link to the Survey:
Take the Survey
<http://qtrial.qualtrics.com/WRSurveyEngine/?Q_SSI=4NGqvar7rzd4PyFm_a3uNyf8ixbCw2U8__1>

Or copy and paste the URL below into your internet browser:
http://qtrial.qualtrics.com/WRSurveyEngine/?Q_SSI=4NGqvar7rzd4PyFm_a3uNyf8ixbCw2U8__1

Follow the link to opt out of future emails:
Dear IWU Student,

Just a reminder that Friday, February 11 is the last day to complete the MSLQ for a $1 coupon for McConn, a score report with study tips, and a chance to win $75. It should take 20 minutes or less.

If you thought you completed the survey but didn’t receive a score report and coupon in your mailbox by this week, you may have omitted the final question (your mailbox number) so I don’t know how to send them to you. Clicking on the link below should take you back to your survey so you can complete it.

I hope your semester is going well!

Sincerely,
Stephanie Santarosa

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:
http://qtrial.qualtrics.com/WRQualtricsSurveyEngine/?Q_SSN=4NGwar7ztMPyFm_a3u4yrf8ixCw2Uj=&=1

Follow the link to opt out of future emails:
http://qtrial.qualtrics.com/CP/Remove.php?OptOut=true&KID=MLKp_bPvYBsn0aSRjDS&FID=1UR_eWKT3wXi2KICos&=1
Santarosa, Stephanie

From: noreply@gemailserver.com on behalf of Stephanie Santarosa <noreply@gemailserver.com>
Sent: Wednesday, December 15, 2010 9:33 AM
To: Santarosa, Stephanie
Subject: Link to Motivated Strategies for Learning Questionnaire-

Dear student,

I've been asked to keep this survey open through Saturday so that those who wanted to could still get in on it after the rush of final papers, tests, exams and travelling home for the break. So I'm going to do that. I won't do the drawing for the $75 until next week and will still send you a score report and McConn coupon in early January.

This will be the last email you'll receive from me unless you take the questionnaire in which case you'll get a thank you!

Merry Christmas!
Stephanie Santarosa

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:
http://qtrial.qualtrics.com/WQRQualtricsSurveyEngine/?Q_SS=gtx5OuokaflB8EGUU_2teCod1ORq3arac&_=1

Follow the link to opt out of future emails:
http://qtrial.qualtrics.com/CP/Register.php?OptOut=true&RID=MI_RP_170e9YQeP3Atm&LID=1UR_cWKT3wXi3KJCe4&_=1
APPENDIX G

PERMISSION LETTER FROM VICE PRESIDENT FOR ACADEMIC AFFAIRS

TO CONDUCT RESEARCH ON IWU CAMPUS
October 12, 2010

Dear Members of the University of Akron Institutional Review Board,

One of your doctoral students, Stephanie Santarosa, has requested permission to conduct research on the Marion campus of Indiana Wesleyan University. This permission has been granted.

Specifically, permission is granted to obtain the following data regarding students enrolled in our institution:

1) Lists of freshman and sophomore students enrolled in History 180 for the Fall 2010 semester.
2) Responses to the Motivated Strategies for Learning Questionnaire (MSLQ) and accompanying demographic information from 100+ freshmen and 100+ sophomores enrolled in sections of History 180.
3) High school GPAs of the students who choose to participate.
4) Final course grades from the 200+ study participants in the History 180 course.
5) Enrollment status of the 200+ study participants in the Spring and Fall semesters of 2011.

It is our understanding that once past initial contact and an invitation to participate in the study, only the student’s identification number will be associated with their responses, high school GPA, and final course grade and that confidentiality of all student data will be maintained.

You are welcome to contact us if any additional information is required concerning Ms. Santarosa’s research.

Sincerely,

Darlene Bressler, PhD
Vice President and Dean
College of Arts & Sciences

James Fuller, PhD
Chair, Institutional Review Board
Indiana Wesleyan University
APPENDIX H

IWU INSTITUTIONAL REVIEW BOARD

RESPONSE TO PROPOSED RESEARCH
DEPARTMENT CHAIR RESPONSE

Motivation for Learning & Achievement in College Freshmen & Sophomores

Title of Research Topic

Stephanie Santarosa
Investigator

I have reviewed your research proposal and have determined that:

Check One:

1. Your proposal is exempt.

2. Your proposal is not exempt and must be forwarded to the Chair of the University Institutional Review Board.

The reason your proposal is not exempt is:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

James O. [Signature]
Department/Division Chair; IRB Chair, IRB Committee Member

October 12, 2009
Date
APPENDIX I

PERMISSION FROM UNIVERSITY OF CHICAGO PRESS

TO REPRINT FIGURE 1
University of Chicago Press
Permissions Department
1427 East 60th Street
Chicago, IL 60637
Phone: 773-702-6986/Fax: 773-702-9786

Permission Grant

Stephanie Santlofer
Assoc. Dean for Residence Life
Indiana Wesleyan University
4201 S. Washington St.
Muncie, IN 47503

Date: May 03, 2011
Grant Number: 10503

Request Date: 04/07/2011
Reference Number: 0049354633

Dear Ms. Santlofer:

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<td>0200804461</td>
<td>TINTO, LEAVING COLLEGE RETHINKING CAUSES CURBS STUDENT AT. Figure #2 (pp. 114 to 114).</td>
<td>$0.00</td>
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</tbody>
</table>

Order Total: $0.00
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For Use In:
a PhD dissertation for the Univ. of Akron

288
APPENDIX J

PERMISSION FROM VANDERBILT UNIVERSITY

TO REPRINT FIGURE 2
-----Original Message-----
From: Graham, Bethany [mailto:bethany.graham@Vanderbilt.Edu]
Sent: Friday, April 08, 2011 11:35 AM
To: Santarosa, Stephanie
Subject: FW: Request for permission to reprint figure in dissertation

Hi Stephanie,

Permission is granted for this one-time use, free of charge.

Regards,

Bethany Graham
Business Manager
Vanderbilt University Press

-----Original Message-----
From: Vanderbilt University Press
Sent: Thursday, April 07, 2011 12:57 PM
To: Graham, Bethany
Subject: FW: Request for permission to reprint figure in dissertation

From: Santarosa, Stephanie [Stephanie.Santarosa@itudues.edu]
Sent: Thursday, April 07, 2011 8:20 AM
To: Vanderbilt University Press
Cc: knight@uakron.edu
Subject: Request for permission to reprint figure in dissertation

To Whom It May Concern:

I am a doctoral student studying working toward a PhD. in Education from the University of Akron. In the course of completing the literature review for my dissertation, I found the figure of Bean & Eaton's (2000) Psychological Model of College Student Retention on page 57 of Reworking the Student Departure Problem to be very helpful in understanding and illustrating important concepts in my discussion of student attrition. I am writing to request permission to reprint this figure in my dissertation giving appropriate credit to the source, a book published by Vanderbilt University Press. See the attachment entitled Figure 2 to see how it would appear on the page.

If I should direct my request to another office or individual or should you need any additional information from me, please let me know. I can be contacted at this email address or at the phone number and address in the signature below. My dissertation advisor is Dr. Catharine Knight. She can be reached at knight@uakron.edu or via knight@uakron.edu.

I hope to hear from you soon. Thank you very much.

Stephanie Santarosa
APPENDIX K

PERMISSION FROM BILL MCKEACHIE TO REPRINT FIGURES AND TABLES AS NEEDED FROM NCRYPTAL PUBLICATIONS
From: Bill McKeachie [mailto:billmck@umich.edu]
Sent: Thursday, February 03, 2011 9:14 PM
To: Matthew L. Kaplan
Cc: Santarosa, Stephanie; Knight, Catharine C
Subject: Re: Permission to reprint figures and tables in dissertation

Dear Stephanie,

You are very welcome to use whatever will be helpful for you. I'll be interested in your findings.

Bill McKeachie

On 2/3/2011 8:42 AM, Matthew L. Kaplan wrote:

Dear Stephanie,

I believe you will want to speak with Prof. Bill McKeachie. He has in general been very generous in granting permission for the MSI-Q. I assume he is also the person to ask about the Research Review. I've cc'd him here so that you two can be in touch.

Best,
Matt

Matt Kaplan, Ph.D.
Managing Director
Center for Research on Learning and Teaching (CRLT)
1071 Palmer Commons
Ann Arbor, Michigan 48109-2218
Phone: (734) 936-0844
Fax: (734) 647-3600
mlkaplan@umich.edu

On Feb 3, 2011, at 8:14 AM, Santarosa, Stephanie wrote:

To Whom It May Concern:

I am a doctoral student studying working toward a PhD. in Education from the University of Akron. In the course of completing the literature review for my dissertation, I found two publications from the University of Michigan National Center for Research to Improve Postsecondary Teaching and Learning to be quite helpful. One is entitled Teaching and Learning in the College Classroom: A Review of the Research Literature (McKeachie, Pintrich, Lin, & Smith, 1986). The other is the Manual
for the Use of the Motivated Strategies for Learning Questionnaire (Pintrich, Smith, Garcia & McKeachie, 1991). I would like to use some of the tables and figures from this publication in my dissertation and am writing to request permission.

From the 1986 publication, I am requesting permission to include the following figure and table in my dissertation:
- Components of Motivation model from pg. 44 (see attachment entitled Figure 3)
- Taxonomy of Learning Strategies table from pg. 26 (see attachment entitled Table 1)

From the 1991 publication, I am requesting to include the following tables in my dissertation:
- Structure of Motivated Strategies for Learning Questionnaire (see attachment entitled Table 2)
- Correlations Among MSLQ Scales (see attachment entitled Table 5)

If I should direct my request to another office or individual at your university or should you need any additional information from me, please let me know. I can be contacted at this email address or at the phone number and address in the signature below. My dissertation advisor is Dr. Catharine Knight. She can be reached at knight@makron.edu.

I hope to hear from you soon. Thank you very much.

Stephanie Santarosa

STEPHANIE SANTAROSA
ASSOCIATE DEAN FOR RESIDENCE LIFE
INDIANA WESLEYAN UNIVERSITY
4201 SOUTH WASHINGTON STREET
MARION, IN 46953
765-577-2747 | 765-577-2631 FAX
stephanie.santarosa@indenius.edu
INDENIU.S EDU
APPENDIX L

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TO REPRINT TABLE 3
Thesis/Dissertation Reuse Request

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APPENDIX M

PERMISSION FROM SAGE PUBLICATIONS TO REPRINT TABLE 6
Title: Reliability and Predictive Validity of the Motivated Strategies for Learning Questionnaire (Msq)
Author: Paul R. Pintrich, David A. F. Smith, Teresa Garcia, Wilbert J. McKeachie
Publication: Educational and Psychological Measurement
Publisher: Sage Publications
Date: 09/01/1993
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