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The Learning and Study Strategies Inventory as a Predictive Measure of 1st Semester Academic Performance of At-Risk Students

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THE LEARNING AND STUDY STRATEGIES INVENTORY AS A PREDICTIVE MEASURE OF 1\textsuperscript{ST} SEMESTER ACADEMIC PERFORMANCE OF AT-RISK STUDENTS

By

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ABSTRACT

This study explored the use of the Learning and Study Strategies Inventory (LASSI) as a predictive measure of the academic success of at-risk college students. Students (n=32) participated in a first-year support program designed to help at-risk college students with retention, academic support, and academic progression at a large state university. Five measures of academic achievement collected by the support program were used as dependent variables. Using multiple regression enter models, students’ LASSI subscale scores were analyzed with each of the five academic achievement variables. Results of the regression models were discussed based on a three-factor model developed by previous research that identified affective, goal, and comprehension monitoring strategies as latent constructs in the LASSI. The usefulness for using the LASSI in collegiate support programs was also discussed.
INTRODUCTION

One tool used to assess students’ learning strategies is the *Learning and Study Strategies Inventory* or *LASSI* (Weinstein & Palmer, 2002). This instrument was designed to determine the students’ study strategies related to three conceptual factors identified by the authors. These three factors are skill, will and self-regulation. The *LASSI* consists of ten scales: (1) anxiety; (2) attitude; (3) concentration; (4) information processing; (5) motivation; (6) selecting main ideas; (7) self-testing; (8) study aids; (9) test strategies; and, (10) time management. The *LASSI* has been used to assess the behaviors, attitudes, motivations and beliefs that relate to successful retention in a collegiate setting (Weinstein & Palmer, 2002).

Purpose of the Study

The purpose of this study is to determine if the ten *LASSI* scales can be used as predictors of academic achievement of at-risk students in the Student Supporting Students Program (SSSP) in the Center for Academic Retention and Enhancement at Florida State University. Academic achievement will be evaluated using cumulative and Fall semester GPA and three other scores from a mid-semester grade report collected by SSSP: (1) attendance; (2) assignment completion; and, (3) quiz and test scores.

Research Questions

This study will address five major research questions. These are:

1. What percentage of the variance in cumulative GPA can be predicted by the ten *LASSI* scales?
2. What percentage of the variance in Fall semester GPA can be predicted by the ten *LASSI* scales?
3. What percentage of the variance in attendance as reported on the SSSP mid-semester grade report can be predicted by the ten *LASSI* scales?
4. What percentage of the variance in assignment completion as reported on the SSSP mid-semester grade report can be predicted by the ten *LASSI* scales?
5. What percentage of the variance in quiz and test scores as reported on the SSSP mid-semester grade report can be predicted by the ten *LASSI* scales?
Expected Outcomes

Previous research (Cano, 2006) conducted a factor analysis of the *LASSI* and suggested three latent constructs which differed from the three components of strategic learning identified intuitively by Weinstein and Palmer (2002). The three-factor model identified statistically for the *LASSI* by Cano (2006) consisted of Affective Strategies, Goal Strategies, and Comprehension Monitoring Strategies. The *LASSI* scales associated with Affective Strategies were: time management, motivation, concentration and attitude. *LASSI* scales measuring anxiety, test strategies, selecting main ideas comprised goal strategies. Finally, Comprehension Monitoring strategies included information processing, self-testing, and study aides in the Cano (2006) study. Cano (2006) also found that Affective Strategies and Goal Strategies were the two constructs that were positively linked to academic performance of college freshman.

Based on these findings, the expected outcomes from this study are that the beta weights (βs) for the Affective *LASSI* scales and the Goal Strategies *LASSI* scales will be positive and higher than the *LASSI* scales that comprise Comprehension Monitoring Strategies. In other words the following *LASSI* scales: time management; motivation; concentration; attitude; anxiety; test strategies; and, selecting main ideas will have higher positive βs than the remaining *LASSI* scales. The remaining *LASSI* scales which comprised Comprehension Monitoring Strategies: information processing; self-testing; and, study aides will have lower, positive βs in the regression analysis.
STATEMENT OF THE PROBLEM

College presents many new challenges to students. These challenges include scheduling, time-management, social, financial, and academic demands placed on college students. In collegiate settings, students are required to think more analytically. Students are also required to obtain information, decipher how much of that information is required, and to create a finished product. Not all college students are sufficiently prepared to meet the challenges of higher education. There are certain groups of students who struggle with these demands, especially the demands of learning in college.

The general make-up of incoming college students is continuously changing. Students with physical disabilities used to attend college at a larger rate than students with learning disabilities (LD). According to Michael Ward and the HEATH Resource Center (2007) between 1988 and 2000, LD was the fastest growing category of reported disabilities among students. According to the FSU Student Disability Research Center (SDRC), there are currently 268 students with diagnosed learning disabilities at the university and 147 with physical disabilities. This is significant because students with physical disabilities do not need as much academic support, as students with learning disabilities. Students with physical disabilities do not necessarily have the same learning challenges as students with learning disabilities. On the other hand, these students require physical modifications and accommodations. However, students with learning disabilities may require additional time on assignments and tests, modified assignments and tests, and additional supports academically.

Research has identified two groups who typically struggle with demands of learning in college. These are: (a) college students that are at-risk; and (b) college students with learning disabilities.
CHALLENGES FACED BY AT-RISK STUDENTS

An at-risk student is a student who needs additional support due to circumstances that may hinder the student’s progress. Circumstances that may put a college student at risk include coming from a low socioeconomic status (SES), poor high school grades, lack of social integration, parents who never attended or graduated from college, attending a low performing high school, and low self efficacy. Some at-risk students come from backgrounds that include a combination of these issues. It is difficult to precisely define at-risk because there are so many different factors that could jeopardize students’ abilities to be successful in college.

According to Sewell & Shah (1967), “socioeconomic status is based on a weighted combination of father’s occupation, father’s formal educational level, mother’s formal educational level, an estimate of the funds the family could provide if the student was to attend college, the degree of sacrifice this would entail for the family, and the approximate wealth and income status of the student’s family” (p.7). The socioeconomic status of the student can determine the resources that the student has received before enrolling in college. Financially, a student may not be able to obtain services other students from middle-class or affluent families can afford. For example, a student from an impoverished background may have reading difficulties and the problem becomes unresolved; but, another, more affluent student with the same deficits in reading can attend a program like Sylvan Learning Center for remediation.

Many studies have concluded that student’s high school grades and social integration are a predictive measure for college success and retention. In many instances these two show a strong correlation. According to Hoffman and Lowitzki (2005),”for non-majority students, those likely facing greater culture shock because of race or religion, high school grades became stronger predictors” (pp. 467). A student’s success in comparison to his/her classmates is also a predictor of college success. “Grades of students in the upper 10% of their high school class showed a direct correlation with college GPA at the end of the second year” (Wade & Walker, 1994, pp. 68).

Another factor that may cause an individual to be at-risk is being a first generation college student. According to Naumann, Bandalos & Gutkin (2003):
“First-generation students have unique personal and educational experiences playing roles in their academic performance in college. First-generation students do not typically have the same sources of support as second-generation students do throughout their education” (pp. 5).

Many students who do not perform well academically in college come from high schools that are low achieving. Low performing high schools include low standards, lack of resources, poor parental involvement and a strained staff and administration. Funding from these schools may be cut because students and the school are not reaching high expectations: therefore, students from low performing schools may receive less funding and resources to perform at a high level.

Self-efficacy is defined as, “individuals’ confidence in their ability to successfully perform academic tasks at a designated level” (Gore, 2006, pp. 93). For example, low self-efficacy can also place a student at-risk for difficulty in college.
CHALLENGES FACED BY STUDENTS WITH LEARNING DISABILITIES

College students with learning disabilities are those students who have a neurobiological disorder that results in a different way of learning. According to Silver, Ruff, Iverson, Barth, Broshek, Bush, Koffler, & Reynolds (2008) “a learning disability is recognized by medical and mental health professionals as a neurobiological disorder of cognitive and/or language processing caused by atypical brain functioning” (pp. 217). There are five common learning disabilities: (1) dyslexia, (2) dyscalculia, (3) dysgraphia, (4) auditory and visual processing disorders and (5) nonverbal learning disability (Silver et al., 2008). According to Harwell (2001) the term dyslexia has been replaced with reading disability, dyscalculia replaced with arithmetic disability and dysgraphia is now called a writing disability. Auditory processing deficit or auditory process disorder results in a person being unable to understand a conversation delivered at normal speed (Harwell, 2001).

Students with learning disabilities face many challenges. For example, “children with severe learning disabilities are likely to manifest an increased number of and increased severity of social and behavioral deficits” (Lyon, G., 1996, pp. 54). Children with disabilities also show signs of attention deficit disorder, and their reading deficits typically become more severe and resistant to intervention. Although there are several types of learning disabilities, students typically have deficits in reading (Lyon, G., 1996). Strategic learning can be used as a gateway to assist students with learning disabilities, especially deficits in reading.
The development of study skills and strategic learning in struggling students whether they are at-risk, or learning disabled, have been shown to help all students successfully adjust to the learning demands in college. Developing strong study skills and strategic learning skills have shown to be extremely important to the success of first year college students. According to Stallworth-Clark & Scott (1996), “the quality of learning and effort in the first term in college have been shown in some studies to be critical predictors of students’ success in college” (p. 4). The quality of learning should include students’ learning and study strategies.

Other researchers have suggested the effectiveness of learning and using college-level study skills. According to Ickes and Fraas (1990): “Recent evidence suggests the use of effective study skills is an important factor in determining success at the college and university level. Unfortunately, it seems a growing number of incoming college students may not be proficient in the use of study skills, due to a lack of previous training; “because of this, academic achievement is likely to suffer, particularly for at-risk college freshmen” (p. 4).

Two components of effectively using study skills that can be used with at-risk college freshmen are strategic learning and metacognition.

Strategic learning attempts to help students organize information so they are able to apply it to numerous academic settings. “Strategic learning aims to generate learning in support of future strategic initiatives that will, in turn, foster knowledge asymmetries that can lead to differences in organizational performance”(Thomas, Sussman & Henderson, 2001, p. 331). Strategic learning is vital to students who are attending or plan to attend college. It is possible to get through high school without the use of good strategic learning skills. In postsecondary schools, however, the curriculum, time management, and overall rigor, demand a high level of strategic learning in order for students to be successful.

A student with good metacognition is well aware of his/her own thinking. “The general knowledge (awareness) and control (monitoring) that an individual has over his
or her thinking and learning is known as metacognition” (Olson, Platt & Dieker, 2008, p. 199). According to Olson et al., (2008) there are two different components of metacognition: (1) a person’s knowledge about his or her cognitive resources and the relationship between those capabilities and the demands of the task; and, (2) the use of self-regulatory mechanisms. Shimamura (2000) stated: “A student with strong metacognitive abilities can evaluate what he or she has learned and determine whether he or she needs further study to perform well on an examination” (p. 142).

Strategic learning and metacognition are very important skills in a collegiate setting. The high level of independence that accompanies postsecondary enrollment makes metacognition important. Metacognition is a necessity for students who are considered learning disabled or LD. “LD students lack the executive processes required for efficient acquisition, combination and integration of new information into their memory stores” (Borkowski, Estrada, Milstead & Hale, 1989, p. 64). The Strategic Instruction Model (SIM) is a tool used to develop students’ strategic learning and metacognition. In summary, by improving strategic learning and metacognition, students learn what to do, how to do it, and why it is important.
METHODS FOR DEVELOPING STRATEGIC LEARNING

There are many effective instructional techniques that can be used to develop strategic learning and metacognition. Cognitive Behavior Modification (CBM) aims to teach students to be aware of how their cognitive thinking affects them academically. Reciprocal Teaching (RT) aims to teach students to be active participants in their education. The Self-Regulated Strategy Development (SRSD) Model aims to assist at-risk students with learning strategies and self-regulation skills (Olson, et al., 2008). The focus of this paper however, will be on the Strategic Instruction Model (SIM). Assessing students’ learning strategies makes it easier to pinpoint how the SIM should be administered to each student effectively.
STRATEGIC INSTRUCTION MODEL (SIM)

There are many methods used to help students obtain study skills and develop metacognitive processes. One method that is widely used is the Strategic Instruction Model (SIM). Donald Deschler and Jean Schumaker created the SIM. According to Olson, Platt, & Dieker (2008): “The purpose of the Strategic Instruction Model is to teach students how to learn and perform academic, social, and job-related tasks so that they can cope with immediate setting demands and generalize these skills across situations and settings throughout their lives” (p. 217).

The Strategic Instruction Model (SIM) is an evidence-based model that may serve as a framework for understanding strategic learning and metacognition. In addition, the SIM can be used as a model for other interventions and programs that teach learning strategies. For these reasons, the SIM model will be used as a standard of comparison for the program assessed in this study, the Student Supporting Students Program (SSSP) at Florida State University.

The Strategic Instruction Model is comprised of three components: (1) strategic curriculum; (2) strategic instruction; and, (3) strategic environment. The Strategic Curriculum Component of the SIM aims to teach students four different strategies: learning strategies, social skill strategies, motivation strategies and executive strategies. Learning strategies are methods that assist students with demands academically. Social skill strategies teach students how to interact with others appropriately. Motivation strategies teach students to develop intrinsic motivation by developing goals. The executive strategies are last in this component and they attempt to help students solve problems independently (Olson et al., 2008).

The next component of the SIM is the Strategic Instruction Component. This component trains teachers to teach the four strategies. There are four procedures that accompany this component: (1) acquisition; (2) generalization; (3) strategic teaching behaviors; and, (4) content enhancement.

The acquisition procedures are a direct instruction model for mastery of strategy use. The University of Kansas Center for Research on Learning developed eight stages of strategy acquisition. Stage 1 determines the student’s ability level, appropriate strategy to
be used, and develops a commitment to use the strategy by the student. Stage 2 orients the student to the new strategy by describing when it is appropriate to use the strategy. Stage 3 is an introduction to the strategy through modeling. Stage 4 allows the student to rehearse the strategy. This stage also allows the instructor to facilitate mediation. Building confidence and fluency through controlled practice and feedback is the goal of stage 5. The next stages facilitate generalization of the strategy by using materials that are grade-appropriate. Stage 6 is the beginning of the generalization process. This stage allows students to use situation-appropriate materials as well as grade-appropriate materials.

   The generalization procedures provide instructors with steps to ensure students can apply new skills to other settings. The final two stages of Strategy Acquisition and Generalization developed by the University of Kansas Center for Research on Learning explains phases for generalization. Stage 7- assesses the student’s mastery via a posttest. According to Olson, Platt, & Dieker (2008) the purpose of this stage is, “to document mastery and to build a rationale for self-regulated generalization” (pp. 223). Stage 8 focuses on the student using the strategy in other settings. The goal of this final stage is ensure generalization across all settings. Table 1 summarizes these eight stages.

   Table 1
   Summary of the Eight Stages of Strategy Acquisition and Generalization

<table>
<thead>
<tr>
<th>Stages of Strategy Acquisition/Generalization</th>
<th>Major Purposes/Goals</th>
</tr>
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<tbody>
<tr>
<td>1. Pretest and make commitments</td>
<td>Determine ability</td>
</tr>
<tr>
<td></td>
<td>Develop commitment</td>
</tr>
<tr>
<td></td>
<td>Decide on appropriate strategy</td>
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<tr>
<td>2. Describe the strategy</td>
<td>Describe when use is appropriate</td>
</tr>
<tr>
<td></td>
<td>Orient</td>
</tr>
<tr>
<td>3. Model the strategy</td>
<td>Model</td>
</tr>
<tr>
<td></td>
<td>State expectations</td>
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**Table 1 (continued)**

**Summary of the Eight Stages of Strategy Acquisition and Generalization**

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<tr>
<th>Stages of Strategy Acquisition/Generalization</th>
<th>Major Purposes/Goals</th>
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<tbody>
<tr>
<td>Check for understanding</td>
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<tr>
<td>4. Conduct verbal elaboration and rehearsal</td>
<td>Ensure comprehension</td>
</tr>
<tr>
<td></td>
<td>Student mediation</td>
</tr>
<tr>
<td></td>
<td>Rehearsal</td>
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<tr>
<td>5. Provide controlled practice and feedback</td>
<td>Review strategy</td>
</tr>
<tr>
<td></td>
<td>Guided practice</td>
</tr>
<tr>
<td>6. Provide advanced practice and feedback</td>
<td>Provide practice in real situations</td>
</tr>
<tr>
<td></td>
<td>Fade prompts and cues</td>
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<tr>
<td>7. Posttest and elicit commitments to generalize</td>
<td>Praise student for mastery</td>
</tr>
<tr>
<td></td>
<td>Commit to generalization</td>
</tr>
<tr>
<td>8. Promote generalization</td>
<td>Identify settings for strategy</td>
</tr>
<tr>
<td></td>
<td>Prompt and monitor student application across settings</td>
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</table>

The content enhancement procedures discuss methods to enhance students’ ability to understand and remember academic material. Content enhancement procedures provide instructors with routines and materials that allow students to comprehend the content that is being presented. This procedure alleviates unimportant information,
teaches students to be actively involved and ensures that abstract concepts are presented in concrete form (Olson et al., 2008).

The final component of SIM is the strategic environment component. This component is designed to develop an environment that promotes a high level of performance or proficiency by students. It includes teaming techniques that assist all professionals and parents involved in the student’s education to work together. An IEP meeting that involves, parents, general and special education teachers, and school administrators, communicating and collaborating in order to ensure a student’s success would be an example of effective teaming techniques that promote development of the strategic environment. The management techniques are methods to manage materials, time and student behavior. The evaluation techniques used in this section pertain to the evaluation of the student, program and teacher. Student assessments and teacher/program evaluations are evaluation techniques that are commonly used. The development techniques consist of ways to systematically implement and develop strategies for students to be successful. Using research based instruction and evaluating the effectiveness for each student is an invaluable development technique (Olson, et al., 2008).

The SIM is an ideal tool to use as a method of teaching strategic learning and metacognitive skills to struggling students. The learning and executive strategies in the Strategic Curriculum Component of the SIM directly correlate with the goals of strategic learning and metacognition. These two strategies are designed to teach students how to solve problems independently and cope with academic demands. The learning strategies used in the SIM teaches skills that help students with memorizing information, paraphrasing and test taking. The purpose of the executive strategies is teaching students how to select and design appropriate strategies. A plethora of college classes require a significant amount of memorization. Students may be required to memorize several facts for a test, or remember things that they learned in previous classes and applying them to later ones. Memorizing, paraphrasing, and test taking are useful skills for incoming freshmen with LD or who are at-risk (Olson, et al., 2008).
ASSESSING LEARNING STRATEGIES

As stated earlier, teaching learning strategies to at-risk students is a necessary task. Effective instruction begins by assessing the students’ abilities to use learning strategies. There are two types of assessment methods used for assessing students’ learning strategies: informal assessments and formal assessments.

**Informal Assessments.** Informal assessments can consist of: portfolios, interviews, exhibitions, probes, and checklists. “Portfolios are purposeful, collaborative, and self-reflective collections of student work generated during the instructional process” (Olson, Platt, and Dieker, 2008, p. 99).

According to (Sattler, 1988), “valuable assessment information is gained through interviewing the child, parents, teachers, and other individuals familiar with the child. Interviews are more open and less structured than formal testing and give interviewees an opportunity to convey information in their own words” (p.4). Interviews are also a great way to determine a student’s likes, dislikes or preferences.

According to The Coalition for Essential Schools (2006), exhibitions are “presentations in which students demonstrate what they know and what they have learned in face-to-face meetings with teachers, parents, and other community members”.

According to (Olson et al., 2008), probes are short assessments that are traditionally used for math and learning factual information. “The use of checklists can provide insight into the ways in which students approach tasks and the types of errors they make. You may also use checklists to gain information concerning any subject area, to find out about interests, to monitor a student’s progress in an inclusive setting, or to use for creating alternative grading structures” (Olson et al., 2008, p. 104).

**Formal Assessments.** Formal assessments are considered typical in education. Formal assessments include: norm-referenced tests and criterion-referenced tests.

Norm-referenced tests have formal procedures for timing, administration, and scoring that must be done exactly the same way for every student. An example of a norm-referenced test would be the American College Testing (ACT), an assessment used by colleges and universities. Norm-referenced tests compare students with similar
characteristics and indicate how a student’s performance compared to the norm group (Clearinghouse, 1999).

Criterion-referenced tests are dissimilar from norm-referenced tests because they compare a person’s performance with his or her own past performance instead of comparing against a group. “Criterion-referenced tests (CRTs) measure the extent to which a student has mastered a skill or task based on an established criterion” (Olson, Platt & Dieker, 2008, pp. 109). The emphasis of criterion-referenced tests is to assess the students’ mastery of a subject. An example of this type of an assessment would be an in class math or spelling test

The LASSI is an example of a formal assessment tool that can be used to assess students’ learning strategies.
A specific type of formal assessment used to assess students learning strategies is the Learning and Study Strategies Inventory or LASSI. This assessment is designed to determine the students’ study strategies related to skill, will and self-regulation. The focus of this assessment is behaviors, attitudes, motivations and beliefs that relate to successful retention in a collegiate setting (Weinstein & Palmer, 2002). Cano (2006) stated that: “The Learning and Study Strategies Inventory (LASSI) is a self-report instrument to assess learning strategies, which is based both on a general model of learning and cognition and on a model of strategic learning” (p. 1023).

According to Weinstein & Palmer (2002), the LASSI can be used for several different functions. The LASSI can be used as a tool to help students develop a greater awareness of their strengths and weaknesses as learners, determine what specific areas require intervention, planning for remediation and enrichment, as a means for instructors to place emphasis on academic material, a pre-post achievement measure, an evaluation tool to assess the degree of success of intervention and an advising/counseling tool for college orientation programs, advising, learning assistance programs, or learning centers.

The LASSI consists of ten scales: (1) anxiety; (2) attitude; (3) concentration; (4) information processing; (5) motivation; (6) selecting main ideas; (7) self-testing; (8) study aids; (9) test strategies; and, (10) time management. The LASSI scales are organized by its authors into the larger components of skill, will, and self-regulation. Information processing, selecting main ideas, and test strategies are all under the skill component of the LASSI. Anxiety, attitude, and motivation fall under the will component of the LASSI and concentration, self-testing, study aids and time management are considered self-regulation subscales (Weinstein & Palmer, 2002).

Skill Component. “The Information Processing Scale assesses how well students can use imagery, verbal elaboration, organization strategies, and reasoning skills as learning strategies to help learn new information and skills and to build bridges between what they already know and what they are trying to learn and remember” (Weinstein & Palmer, 2002, pp. 5).
The Selecting Main Ideas Scale determines whether a student can effectively identify the key points in a lecture or decide what is important in a textbook. It also investigates whether or not a student can decipher between important information and supporting details (Weinstein & Palmer, 2002).

The Test Strategies Scale assesses students’ ability to prepare for tests and their test-taking strategies. This scale attempts to answer whether or not the student is able to study for different types of tests in different classes and whether or not the student reviews essays on tests (Weinstein & Palmer, 2002).

*Will Component.* The Anxiety Scale of the *LASSI* allows students to be assessed on how much they worry about their academics. Does the student worry so much about their success academically that they cannot concentrate? Does the student become discouraged by grades that are not what they expect? This scale attempts to determine the answers to both of these questions (Weinstein & Palmer, 2002).

The Attitude Scale determines if a student has a level of clarity of their academic goal(s) and level of commitment to academics. This scale is designed to determine if the student has a desire to succeed academically (Weinstein & Palmer, 2002).

“The Motivation Scale assesses students’ diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements. Weinstein & Palmer (2002) inferred: “Do students stay up-to-date in class assignments? Do they easily ‘give up’ in difficult classes?” (p.5).

*Self-Regulation Component.* The Concentration Scale assesses whether or not students are easily distracted and if they can give their undivided attention to academic material. This portion of the *LASSI* is designed to determine if the student is easily distracted and how well can they direct their attention to school related tasks (Weinstein & Palmer, 2002).

Students’ ability to review material before a test is assessed on the Self-Testing Scale. This scale looks at students’ reviewing and comprehension techniques in regards to their test preparation. This scale assesses reviewing and comprehension monitoring techniques to determine the students’ level of understanding (Weinstein & Palmer, 2002).

The Study Aids Scale assesses students’ usage of supplemental materials as an aid for recalling new information. Do students complete practice exercises and use
organizational aids when studying? This scale also determines whether or not a student uses organizational aids or completes practice exercises (Weinstein & Palmer, 2002).

The last scale of the LASSI is the Time Management Scale. This scale assesses students’ ability to organize their schedules for academic purposes. Are students able to organize their time? Do students’ plan ahead in anticipation of scheduling conflicts/problems (Weinstein & Palmer, 2002)?

Weinstein and Palmer (2002) intuitively divided the 10 LASSI, 2nd edition subscales into three components; will skill and self-regulation. Cano (2006) used three different components because, statistically, the components used by Weinstein and Palmer were not significant when grouped together through factor analysis. Cano (2006) grouped the ten subscales into the following statistically identified latent constructs: affective strategies; goal strategies; and, comprehension monitoring strategies. Affective strategies consist of, time management, motivation, concentration, and attitude. Goal strategies consists of, anxiety, test strategies, and selecting main ideas. Information processing, self-testing and study aids are the three components of comprehension monitoring strategies. This study is also designed to look at the statistical significance of Cano’s 3 components of the LASSI, 2nd edition subscales.

Administration. The LASSI, 2nd edition is easily administered because of its self-report format. This is an 80 question assessment that has five possible responses: (1) very much typical of me; (2) fairly typical of me; (3) somewhat typical of me; (4) not very typical of me; (5) not at all typical of me. The student must choose one of the responses for each question. The directions for the LASSI are printed on the front of each booklet so this assessment does not take any special administration or specially trained personnel to administer. The LASSI typically takes students 15-20 minutes to complete, but it is not timed (Weinstein & Palmer, 2002). The assessment is on NCR (no carbon required) paper. NCR paper allows the responses to be written on a chart on the back pages of the LASSI that depict each LASSI subscales’ percentile compared to a national sample. There is also a scoring interpretation section on the LASSI, 2nd edition that describes the significance of the percentile.

Weinstein & Palmer (2002) used alpha coefficient for each of the 10 LASSI (2nd edition) subscales to determine the reliability of this assessment. Eight of the 10 subscales
yielded alpha coefficients of .80 or above. Study aids and attitude yielded alpha coefficients of .73 and .77 respectively. Overall this assessment can be considered reliable.

The LASSI has been incorporated in numerous studies. This inventory has been used to assess students in high school and college. The studies range from domestic to international; and the range of students they evaluate are extraordinary. In a study entitled, *The Learning and Study Strategies of College Students with ADHD*, Reaser, Prevatt, Petscher and Proctor (2007) compared the learning and study strategies of students with attention-deficit hyperactivity disorder, LD, and students without disabilities. The LASSI was used specifically in this study to evaluate the strengths and weaknesses of students with ADHD and to predict academic achievement in this group of students. The study concluded that differences in learning and study strategies exist between all three groups assessed (Reaser et al., 2007).

In another study Kirby, Silvestri, Allingham, Parrila, and La Fave (2008) described the self-reported learning strategies and study approaches of college and university students with and without dyslexia. Kirby et al. (2008) compared 36 students with dyslexia to 66 students without dyslexia. The LASSI was used to assess the differences in the two groups’ learning strategies and study approaches. The study concluded that students with dyslexia scored higher on selecting main ideas and test taking strategies. The study also concluded that students with dyslexia use study aids and time management strategies significantly more than students without dyslexia.

Prevatt, Petscher, Proctor, Hurst, and Adams (2006) compared the study skills of students who performed poorly academically to students who did well by using the LASSI. The study defined “academically-struggling” with students whose grade point average was below a 2.5 on 4.0 scale. According to (Proctor et al., 2006) “the present study illustrates that students who experience academic difficulties exhibit a paucity of study skills as compared to their normal-achieving counterparts and that the profiles of study skills deficits are relatively consistent across different groups of low-performing students” (p. 448).

In 1996, a study was conducted to assess the study skills of students with LD in secondary settings. The *Assessing Study Skills of Students with Learning*
Disabilities (Benz, Fabian & Nelson, 1996), “sought to investigate the usefulness of the LASSI as a diagnostic and prescriptive instrument for secondary school students with disabilities” (p. 350). The LASSI was administered as a pretest and a posttest. The study concluded that the LASSI could provide valuable diagnostic and prescriptive information in order to develop study skill programs. The study administered the LASSI to 25 student’s ages 16-19 who were identified as having learning disabilities. The study concluded the usefulness of the LASSI in determining deficits in different areas and giving educators the opportunity to implement interventions based on their findings (Benz et al., 1996).
PREDICTING ACADEMIC SUCCESS

As stated previously the LASSI is a tool that can be used for numerous purposes. This study will focus on how the LASSI can be used to predict academic success based on the three-factor model described by Cano (2006). Students and educators can use the subscales of the LASSI to identify in what areas the students struggle and identify their strengths. Identifying the areas in which a student has weaknesses allows for an intervention. Identifying areas where the student is strong allows the student to use that area to increase in other areas that he/she maybe deficient. For example, if a student identifies that he/she has very strong time management skills but weak self-testing skills, the student can use his strengths in time management to create more time to develop self-test skills.

Students’ academic success can also be identified by their grade point averages or GPAs. In a study produced by Proctor et al. (2006) students with low GPA’s were compared to students with high GPA’s to determine if there was a difference in the study skills between the two groups. The aforementioned study determined that students with low GPA’s experience more academic difficulties in regards to study skills than their normal achieving counterparts. The specific areas identified as academic deficits that could effect academic achievement for students with learning disabilities are motivation, anxiety, concentration, selecting main ideas, and test strategies.

Other Measures of Academic Success. Although GPA can be an effective predictive measure of academic achievement, it is only updated once per semester. The Center for Academic Achievement and Enhancement or CARE program at Florida State University has developed a mid semester grade report to keep up with students’ academic progress. Students are required to give each of their professors a copy of the mid semester grade report during the middle of the semester. The mid semester report describes the logistics of the CARE program to professors and asks for assistance in helping the student succeed academically. The mid semester grade report asks instructors to rate the students’ class attendance, assignment completion, and quiz/test scores as excellent, good or poor. The grade report also inquires about the students’ progress and makes
recommendation for tutorial services. This form can be a very good indicator of how well a student is doing in the middle of the semester.

Each student is expected to give each professor a mid-semester grade report sheet. Class attendance, assignment completion, and quiz/test scores will all be quantified 1-3 scale. For example, poor is equivalent to “1”, good is equivalent to “2”, and excellent is equivalent to “3”.
METHODS

Participants

Participants in this study were first generation freshman students at Florida State University who are at-risk. These students were a part of Students Supporting Students (SSS) which is part of the larger Center for Academic Retention and Enhancement (CARE) program. A total of 31 students participated, 22 females, and 9 males. Students were predominately African-American. The majority of participants were first generation college students and come from single parent homes.

Measures

Predictor/Independent Variables. The *Learning and Study Strategies Inventory*, 2nd edition (*LASSI*); (Weinstein & Palmer, 2002), was used to identify variables which predict academic success. The 10 ten subscales used in the *LASSI* was administered to identify the strengths and weaknesses of the students in this study. The *LASSI* was selected because, “the *LASSI* has been shown to be positively correlated with grade point average and is considered to be an effective tool for predicting academic performance” (Reaser, Prevatt, Petscher and Proctor, 2007, p. 630). The *LASSI* is also a good assessment device because it is easily administered and assessed.

Criterion/Dependent Variables. There were five dependent variables used in this study. The first measures of academic success are the student’s cumulative GPA and Fall semester GPA. The mid-semester grade report was also used to measure students’ academic achievement. This report evaluated student’s class attendance, assignment completion and quiz/test scores. Each student gave a blank mid-semester report to each of their professors and returned it to the CARE office upon completion. The students mid-semester reports determined the amount of tutorial hours they were required to complete for the remainder of the semester. The other dependent variables collected from the mid-semester grade report include: class attendance, assignment completion, and quiz scores.

Procedures
All students in SSS were required to complete the LASSI. The LASSI was administered by the Program Director of SSS. The LASSI was given to all participants at once in a group administration. The LASSI administrator gave participants’ instructions on how the LASSI should be scored and once the LASSI is scored the tests were collected and the scores for each subscale were inserted into a database.

According to Weinstein & Palmer (2002):
The LASSI yield ten individual scale scores, one for each of the ten scales. No total score is computed because this is a diagnostic instrument. These scale scores can then be compared numerically or graphically to the norms provided or to local norms or cut-off scores developed by an institution or program. The data provided with the LASSI includes percentile score equivalents. Based on a student’s scale scores, either in relation to the national norms included with the instrument or to a percentile cut-off score, prescriptions can then be made (pp. 6).

All SSSP students’ were expected to turn-in a completed mid-term report from their professors for the semester and return them to the Program Director of SSSP. The mid-term report was scored based on the student’s attendance, quiz/test scores, and assignment completion. Each factor were rated using the following criteria; excellent, good, or poor. A student who received an excellent received a “3”, good received a “2”, and poor received a “1”. Each student’s academic performance was based on their class attendance, assignment completion, and quiz/test scores ratings. Each of these ratings was calculated and averaged for every class the student returned a mid-term report.

The student’s term GPA and cumulative GPA was also included in this study as a predictive measure of academic success.

Analysis
A series of multiple regression analyses was conducted regressing scores on cumulative GPA, fall semester GPA, and three measures from the mid-semester report card (class attendance, assignment completion and quiz/test scores) on the 10 LASSI scales. The statistical software program SPSS was used to conduct the analysis and summarize the results of this study.
RESULTS

As stated earlier, the purpose of this study was to determine if the ten LASSI scales can be used as predictors of academic achievement of at-risk students in the Student Supporting Students Program (SSSP) in the Center for Academic Retention and Enhancement at Florida State University. Academic achievement will be evaluated using cumulative and Fall semester GPA and three other scores from a mid-semester grade report collected by SSSP.

Research Questions

This study will address five major research questions. These are:
1. What percentage of the variance in cumulative GPA can be predicted by the ten LASSI scales?
2. What percentage of the variance in Fall semester GPA can be predicted by the ten LASSI scales?
3. What percentage of the variance in attendance as reported on the SSSP mid-semester grade report can be predicted by the ten LASSI scales?
4. What percentage of the variance in assignment completion as reported on the SSSP mid-semester grade report can be predicted by the ten LASSI scales?
5. What percentage of the variance in quiz and test as reported on the SSSP mid-semester grade report can be predicted by the ten LASSI scales?

Expected Outcomes

Previous research (Cano, 2006) has conducted factor analysis of the LASSI and suggested three latent constructs. These were Affective Strategies, Goal Strategies, and Comprehension Monitoring Strategies. The LASSI scales associated with Affective Strategies were: time management, motivation, concentration and attitude. LASSI scales measuring anxiety, test strategies, selecting main ideas comprised goal strategies. Finally, Comprehension Monitoring strategies included information processing, self-testing, and study aids in the Cano (2006) study. Cano (2006) also found that Affective Strategies and Goal Strategies were the too construct that were positively linked academic performance of college freshman.
Based on these findings, the expected outcome from this study are that the beta weights (βs) for the Affective LASSI scales and the Goal Strategies LASSI scales will be positive and higher than the LASSI scales that comprise Comprehension Monitoring Strategies. In other words the following LASSI scales: time management; motivation; concentration; attitude; anxiety; test strategies; and, selecting main ideas will have higher positive βs than the remaining LASSI scales. The remaining LASSI scales which comprised Comprehension Monitoring Strategies: information processing; self-testing; and, study aides will have lower positive βs in the regression analysis.

The 32 students in this study (23 female, 9 male) were all first generation college students. All students were freshmen at Florida State University. These students came in together in June of 2008 through the Center for Academic Retention and Enhancement’s (CARE) Summer Bridge Program. Upon arrival to Florida State University these students applied and were accepted into the Student Support Services Program (SSSP). SSSP is designed to assist at-risk students-through small group instruction, tutoring, exposure to graduate schools and academic monitoring-complete their undergraduate degree and move on to take graduate courses. The average and range of cumulative grade point averages for these students were 2.98 and 1.50 to 3.84, respectively. Participant characteristics are shown in Table 2.

Table 2

Participant Characteristics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Cumulative GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Average 18.30</td>
<td>Average 2.98</td>
</tr>
<tr>
<td>Female</td>
<td>Range 17 to 20</td>
<td>Range 1.50 to 3.84</td>
</tr>
</tbody>
</table>
Students’ learning strategies were assessed at the beginning of their fall semester using the *Learning and Study Strategies Inventory* (*LASSI*). The 10 subscales in the *LASSI* were used as independent variables (predictor variables). The variables for academic achievement (criterion variables) were cumulative GPA, fall GPA, class attendance, assignment completion and quiz/test scores. Table 3 shows the variables used in this study.

*Table 3*

*Summary of Multiple Regression Academic Variables*

<table>
<thead>
<tr>
<th>Dependent Variables (criterion)</th>
<th>Independent Variables (predictor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative GPA</td>
<td>Test Strategies</td>
</tr>
<tr>
<td>Fall GPA</td>
<td>Self-Testing</td>
</tr>
<tr>
<td>Class Attendance</td>
<td>Study Aides</td>
</tr>
<tr>
<td>Assignment Completion</td>
<td>Selecting Main Ideas</td>
</tr>
<tr>
<td>Test/Quiz Scores</td>
<td>Information Processing</td>
</tr>
<tr>
<td></td>
<td>Attitude</td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
</tr>
<tr>
<td></td>
<td>Time Management</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Concentration</td>
</tr>
</tbody>
</table>
A series of multiple regression analyses were conducted for each of the five academic achievement or dependent variables using the 10 *LASSI* subscale scores as predictors. The enter method of multiple regression was used because there was no predetermined model for the contribution of *LASSI* subscales on academic achievement and because there was a small number of participants in this study. Results for each of the five academic achievement variables are described next.

*Results for Cumulative GPA*

When the 10 *LASSI* subscales scores were used to predict cumulative GPA, this model yielded a $R^2$ of .557. This suggests that approximately 56% of the variance in cumulative GPA can be explained by scores on the 10 *LASSI* subscales. However, because of the small number of participants in this study, it is more conservative to look at the results for $R^2$ adjusted. The $R^2$ adjusted for this model was .347.

The two *LASSI* predictor variables that had the strongest positive influence on cumulative GPA were motivation and self-testing. Motivation yielded a standardized regression coefficient or beta of 0.893 and self-testing resulted in a beta of 0.391. However, only the beta obtained for motivation was statistically significant ($p=0.001$). These were the highest positive betas obtained by this model and suggest that motivation and self-testing skills have the greatest positive impact of the 10 *LASSI* subscales on cumulative GPA. Table 4 shows the regression coefficients for all the 10 *LASSI* subscales when cumulative GPA was used as the criterion.

*Table 4*

*Summary of Multiple Regression Analysis for LASSI Variables Predicting Cumulative GPA (N = 32)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>.05</td>
<td>0.20</td>
<td>.838</td>
</tr>
<tr>
<td>Motivation</td>
<td>.89</td>
<td>3.88</td>
<td>.001</td>
</tr>
<tr>
<td>Concentration</td>
<td>.25</td>
<td>0.71</td>
<td>.484</td>
</tr>
<tr>
<td>Attitude</td>
<td>-.65</td>
<td>-2.52</td>
<td>.020</td>
</tr>
</tbody>
</table>
Motivation to succeed means students will take the extra step to meet the highest requirements. Student’s who lack motivation may be less likely to succeed in college because they feel that college is not important or necessary. Students who are able to effectively monitor their own education by reviewing and monitoring their own comprehension of information are also more likely to succeed academically than other students. Students who are equipped with self-testing strategies are more equipped to deal with the rigor of a college curriculum.

Attitude and test taking strategies both presented strong negative relationships with cumulative GPA. Attitude yielded a beta of -.647 with a significance level of .020 and test taking resulted in a beta of -.553. This suggests attitude and test taking strategies have an inverse relationship with the LASSI scales.

Students with negative attitudes may have a negative perception on education and use that as motivation to succeed. Therefore, through this model, attitude has shown an
inverse effect on cumulative GPA. Also presented in this model, the lower students score on the test strategies scale, the higher their GPA. This may be caused by students taking classes that do not concentrate on test heavily for assessment. Student may also focus more of their attention on homework or projects if they feel that they are unable to perform consistently at a high level when taking test.

Results for Fall GPA

Fall GPA was used as the criterion variable with the 10 LASSI scores being the predictor variables. This model yields a $R^2$ of .573 which means 57% of the variance in Fall GPA can be attributed to the 10 LASSI subscales. Since this study has a small sample size it is important to look at the adjusted $R^2$ of 0.369. The adjusted $R^2$ for this model indicates that 37% of the 10 LASSI subscales account for the variance in Fall GPA.

Self testing and motivation are the two criterion variables that have the highest positive beta value for this model. Self testing yielded .423 beta and motivation was a .870. Motivation was the only one of the two that showed significance (p=.001). Attitude and test strategies had the highest negative correlation on Fall GPA. Attitude compiled a beta score of -.529 and test strategies -.667. Although both of these criterion variables displayed strong negative effects on Fall GPA only attitude showed significance. Table 5 shows the relationship between 10 LASSI scores (predictor variables) and their effect on Fall GPA.

The significance of motivation in our model can be contributed to many factors. First, a person who is motivated to succeed academically is more likely to study diligently. Students who work harder in the classroom typically perform better than their peers who lack motivation. Motivation may also lead to students’ willingness to seek help.

Students with poor test taking strategies skills may register for classes that are easier or that do not require tests in order to get better grades. Students with low test strategies skills may also use a high level of motivation to study harder and longer for test. Students with poor attitudes towards academics may experience more pressure from close relatives and friends to succeed therefore increasing their Fall GPA in an attempt not to disappoint.
Table 5

Summary of Multiple Regression Analysis for LASSI Variables Predicting Fall GPA (N = 32)

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affective strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>.01</td>
<td>0.20</td>
<td>.838</td>
</tr>
<tr>
<td>Motivation</td>
<td>.13</td>
<td>3.88</td>
<td>.001</td>
</tr>
<tr>
<td>Concentration</td>
<td>.01</td>
<td>0.71</td>
<td>.484</td>
</tr>
<tr>
<td>Attitude</td>
<td>-.09</td>
<td>-2.52</td>
<td>.020</td>
</tr>
<tr>
<td><strong>Goal strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.02</td>
<td>1.15</td>
<td>.262</td>
</tr>
<tr>
<td>Test Taking</td>
<td>-.08</td>
<td>-1.67</td>
<td>.109</td>
</tr>
<tr>
<td>Selecting Main Idea</td>
<td>-.01</td>
<td>-.624</td>
<td>.539</td>
</tr>
<tr>
<td><strong>Comprehension Monitoring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Processing</td>
<td>-.01</td>
<td>0.58</td>
<td>.571</td>
</tr>
<tr>
<td>Self-Testing</td>
<td>.04</td>
<td>1.57</td>
<td>.131</td>
</tr>
<tr>
<td>Study Aids</td>
<td>.01</td>
<td>0.23</td>
<td>.815</td>
</tr>
</tbody>
</table>

Note. $R^2 = .57$; $\Delta R^2 = .37$

Results for Attendance

This model yielded a $R^2$ of 0.368 which is equivalent to 37% of the variance of the attendance scores that can be determined by the 10 LASSI subscales. Unfortunately, due to a small group of participants this model only yielded an adjusted $R^2$ of 0.067. This means that this model has accounted for only 7% of the variance of attendance.

Motivation has the highest standardized coefficient (0.687) and selecting main ideas has the second highest total (0.392). Motivation and selecting main ideas are the two LASSI subscales that have the largest positive impact on attendance.
Students who are motivated understand what it takes to be successful in college. One of those factors is class attendance. Hence, students with high motivation to succeed do what is necessary, including attending classes.

Concentration and test strategies both have negative standardized coefficients. Test strategies possesses the highest with a -0.516 standardized coefficients. Students who lack knowledge of effective techniques for preparing test may feel ill prepared for class and just refuse to show up. This is interesting because it is to decipher the effect that attendance would have on test scores and/or strategies. Adversely, test taking and concentration show the strongest negative correlation to attendance in this model.

Students who are unable to concentrate may feel like going to class is useless. A person who has a difficult time concentrating may attend class initially but may not see the results they are looking for because they have missed out on important information while losing focus periodically.

Table 6
Summary of Multiple Regression Analysis for LASSI Variables Predicting Attendance (N = 32)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>.10</td>
<td>.353</td>
<td>.728</td>
</tr>
<tr>
<td>Motivation</td>
<td>.69</td>
<td>2.50</td>
<td>.021</td>
</tr>
<tr>
<td>Concentration</td>
<td>.45</td>
<td>-1.08</td>
<td>.294</td>
</tr>
<tr>
<td>Attitude</td>
<td>-.12</td>
<td>-2.52</td>
<td>.020</td>
</tr>
<tr>
<td>Goal Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.30</td>
<td>1.15</td>
<td>.262</td>
</tr>
<tr>
<td>Test Taking</td>
<td>-.52</td>
<td>-1.308</td>
<td>.205</td>
</tr>
<tr>
<td>Selecting Main Idea</td>
<td>.39</td>
<td>1.271</td>
<td>.218</td>
</tr>
<tr>
<td>Comprehension Monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Processing</td>
<td>-.22</td>
<td>-.892</td>
<td>.571</td>
</tr>
</tbody>
</table>
Table 6 (continued)

Summary of Multiple Regression Analysis for LASSI Variables Predicting Attendance (N = 32)

<table>
<thead>
<tr>
<th>Variable</th>
<th>( \beta )</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Testing</td>
<td>.35</td>
<td>1.17</td>
<td>.254</td>
</tr>
<tr>
<td>Study Aids</td>
<td>.05</td>
<td>0.22</td>
<td>.825</td>
</tr>
</tbody>
</table>

Note. \( R^2 = .37; \Delta R^2 = .07 \)

The ability to select the main idea in college is a necessary skill. Selecting a main idea may also lead a student to complete more assignments. It is important to be able to identify what is being asked before being able to answer what is being asked. Students who are successfully able to do so at a high level may feel more confident completing assignments because it is easier and quicker for them than students who lack this skill.

Results on Assignment Completion

The model for assignment completion yielded an \( R^2 \) of 0.280. Therefore, 28% of the variance can be contributed to the 10 LASSI scales. The adjusted \( R^2 \) is -0.063; the model has accounted for -6.3% of the variance in assignment completion. This means there is a negative influence of this model on assignment completion when taking into account the sample size of this study.

Attitude and selecting main ideas have the highest beta values, 0.435 and 0.379 respectively. These values represent the greatest positive impact of the 10 LASSI skills on assignment completion. In this model, none of the 10 LASSI subscales were determined to be significant. The subscale that was closest to significance was concentration with significance of 0.073. Student’s concentration had the largest inverse affect on assignment completion with a standardized regression coefficient of -0.846.

Student’s inability to concentrate may cause them to have a higher assignment completion because they can complete assignments in segments, work on the assignments early, and/or use their positive attitude towards education as an advantage.
Students with positive attitudes toward education have a higher percentage of assignment completion. The student who strives for good grades, is diligent and willing to go the extra mile to be successful is more willing to do what it takes to complete assignments that an individual who possesses a negative attitude towards higher education.

Table 7
Summary of Multiple Regression Analysis for LASSI Variables Predicting Assignment Completion
(N = 32)

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>.35</td>
<td>1.089</td>
<td>.289</td>
</tr>
<tr>
<td>Motivation</td>
<td>.12</td>
<td>.420</td>
<td>.679</td>
</tr>
<tr>
<td>Concentration</td>
<td>-.85</td>
<td>-1.889</td>
<td>.073</td>
</tr>
<tr>
<td>Attitude</td>
<td>.44</td>
<td>1.325</td>
<td>.199</td>
</tr>
<tr>
<td>Goal Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.20</td>
<td>.057</td>
<td>.955</td>
</tr>
<tr>
<td>Testing Strategies</td>
<td>.18</td>
<td>.423</td>
<td>.676</td>
</tr>
<tr>
<td>Selecting Main Idea</td>
<td>.38</td>
<td>1.150</td>
<td>.263</td>
</tr>
<tr>
<td>Comprehension Monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Processing</td>
<td>-.16</td>
<td>-.567</td>
<td>.577</td>
</tr>
<tr>
<td>Self-Testing</td>
<td>.05</td>
<td>.150</td>
<td>.882</td>
</tr>
<tr>
<td>Study Aids</td>
<td>-.11</td>
<td>-.454</td>
<td>.654</td>
</tr>
</tbody>
</table>

Note. $R^2 = .28; \Delta R^2 = -.06$

Results on Test/quiz scores

When the 10 LASSI subscales scores were used to predict cumulative GPA, this model yielded a $R^2$ of .382. This suggests that approximately 38% of the variance in
cumulative GPA can be explained by scores on the LASSI subscales. However, because of the small number of participants in this study, it is more conservative to look at the results for $R^2$ adjusted. The $R^2$ adjusted for this model was .088.

The highest positive standardized regression coefficient is motivation. The beta for motivation is 0.641. The significance of motivation in this model is 0.28 which means it can be deemed analytically significant. Attitude and testing strategies have strong negative standardized regression coefficients. Therefore, according to the study, the lower students score on the attitude and testing strategies subscales the better they do on quiz/test scores. Motivation is the only subscale in this model that is mathematically significant.

This model displays the significance of motivation on quiz/test scores for this population. The more self-discipline, diligence, and willingness there is to perform at a high level academically, the better the quiz/test scores are.

In contrast, a student’s attitude shows a strong negative variance on quiz/test scores. A student acknowledging a poor attitude towards academics may have an adverse effect on his/her education. A student having a poor attitude about education may have extrinsic motivators so succeed academically. Students with poor attitudes about education are aware of their negative perceptions and may use motivation as means for excelling on test/quizzes.

The test strategies scale yielded a -.413 coefficient for this model. This is interesting because it means that students who lack the ability to effectively prepare for test/quizzes score higher on test/quizzes. Students who know they are not very good test takers may use time management or other methods to ensure better grades on test/quizzes.
Table 8
Summary of Multiple Regression Analysis for LASSI Variables Predicting Quiz/Test Scores
(\(N = 32\))

<table>
<thead>
<tr>
<th>Variable</th>
<th>(\beta)</th>
<th>(t)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>.35</td>
<td>1.187</td>
<td>.248</td>
</tr>
<tr>
<td>Motivation</td>
<td>.64</td>
<td>2.360</td>
<td>.028</td>
</tr>
<tr>
<td>Concentration</td>
<td>.001</td>
<td>.002</td>
<td>.999</td>
</tr>
<tr>
<td>Attitude</td>
<td>-.57</td>
<td>-1.888</td>
<td>.073</td>
</tr>
<tr>
<td>Goal Strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.14</td>
<td>.445</td>
<td>.661</td>
</tr>
<tr>
<td>Testing Strategies</td>
<td>-.41</td>
<td>-1.056</td>
<td>.303</td>
</tr>
<tr>
<td>Selecting Main Idea</td>
<td>.01</td>
<td>.026</td>
<td>.979</td>
</tr>
<tr>
<td>Comprehension Monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Processing</td>
<td>-19</td>
<td>.73</td>
<td>.472</td>
</tr>
<tr>
<td>Self-Testing</td>
<td>.23</td>
<td>.784</td>
<td>.442</td>
</tr>
<tr>
<td>Study Aids</td>
<td>-.12</td>
<td>-.562</td>
<td>.580</td>
</tr>
</tbody>
</table>

Note. \(R^2 = .38; \Delta R^2 = .09\)
DISCUSSION

This study suggests that scores on the LASSI can be used to predict certain academic achievement variables. In this study multiple regression models suggested that LASSI scores predict a large amount of the variance in two variables related to academic achievement—cumulative GPA and Fall semester GPA. The R squared for these two variables were .557 and .573, respectively. LASSI scores also predicted approximately 38% of the variance in test and quiz scores and 37% of the variance in class attendance of at-risk students used in this study. Finally, LASSI scores yielded an R$^2$ squared of .28 for assignment completion.

However, because of the large number (10) of predictor variable used in this study and the small number of participants, it is more appropriate to use the R$^2$ adjusted coefficients to interpret the results. When R$^2$ adjusted is used to interpret the percent of variance predicted by LASSI scores on academic achievement, a different picture emerges. Fall GPA and cumulative GPA showed respectable adjusted R$^2$. Fall GPA had the highest adjusted R squared at 0.369 and cumulative GPA followed with 0.347. LASSI scores also predicted approximately 9% of the variance in test and quiz scores and 7% of the variance in class attendance of at-risk students used in this study. The sample size of this study tremendously affected assignment completion by yielding an R$^2$ of -.063.

The results of this study must be interpreted with caution, however. As mentioned before, there were only 32 participants in this study. Researchers suggest that the number of participants in multiple regression analysis be at least five times the number of predictor variables. Since there were 10 predictors variables used in this study, it would have strengthened the study to have a least 50 participants. In fact, some researchers suggest that there be 10 to 40 times the number of participants as predictor variables.

Another reason why the results of this study should be interpreted cautiously is the problem of muticollinearity. Multicollinearity is when more than one predictor variable shows strong correlations. Researchers have determined that such high correlations make it difficult to infer about the contribution of each predictor variable across the model.
There are disadvantages and advantages to every model of assessment. One tool this study used to assess academic success was the SSSP mid-term report. This is a quick assessment tool that informs the SSP of student’s attendance, academic progress, and class participation. The advantages of this type of tool is that you can find out a student’s progress midway through the semester, be able to provide the student with an intervention before the final grades are posted, and it develops a dialogue between the student and the professor. Mid-term reports may also become extrinsic motivation for the student to perform well academically due to the fact that student is aware of being monitored. However, these forms of assessment are subjective, can be misleading, and can get lost in translation. Other issues of the mid-term report include, the teachers’ refusal to complete the form and students being apathetic about the reports.

As stated previously, the LASSI can be used as a tool to help students develop a greater awareness of their strengths and weaknesses as learners, determine what specific areas require intervention, planning for remediation and enrichment, as a means for instructors to place emphasis on academic material, a pre-post achievement measure, an evaluation tool to assess the degree of success of intervention and an advising/counseling tool for college orientation programs, advising, learning assistance programs, or learning centers (Weinstein & Palmer, 2002). However, the LASSI is a self-report instrument which is cause for concern. A Student who is in a program like SSSP, want to impress their peers and/or administrators and the LASSI may not depict the student accurately.

Future research should increase the number of at risk students who participate in this study. More participants in the study will make it easier to draw clearer conclusions, correlations, and significance of different variables. Another improvement would be to standardize the academic program so that students were participating in similar courses. It is difficult to determine the academic achievement of students when you do not know what course these students are taking. For example, it is difficult to draw a conclusion about a student’s test taking strategies in an art class and compare those scores to another student who is taking college algebra. Another variable that should be included is the quality of a student’s high school experience. This is important because there are so many different types of schools with different ability levels; these factors may cause influence the results of future studies.
For cumulative GPA, all of the betas for the Cano (2006) affective and goal strategies factors were higher than the betas for the comprehension factor, with one exception--self-testing. This was in keeping with the expected outcomes of this study. However, the betas for three LASSI subscales in affective and goal strategies factor were in the negative direction, contrary to the expected outcomes of this study.

When Fall GPA was used as the criterion variable, the model generally yielded higher beta weights for the Cano (2006) affective and goal strategies factor than the comprehension monitoring strategies; with the exception of self-testing again. The LASSI test taking, selecting main ideas and information processing subscales all showed negative beta coefficients, however, which was contrary to the expected outcomes.

In the summary of multiple regression analysis for LASSI variables predicting attendance, the LASSI subscales of time management and attitude in the affective strategies factor were less than the LASSI variables information processing and self-testing of the comprehension monitoring subset; this data was inconsistent with the Cano (2006) findings. Negative betas were also found in the attitude, test taking, and information processing subscales in this model. Two of the three LASSI subscales in the goal strategies subset (test taking & selecting main ideas) yielded higher beta than all three of the subscales in the comprehension monitoring strategies; therefore, the findings for the attendance model were expected for the LASSI subscales of test taking and selecting main ideas.

For the purpose of this study, the variables for affective strategies and goal strategies all showed higher beta weights than the variables in the comprehension monitoring subset; except for motivation. Contrary to Cano (2006), results in this study yielded that motivation showed a slightly lower beta coefficient than information processing. In 2006, Cano found that motivation yielded the highest beta coefficient among the 10 LASSI subscales. Therefore, the low beta coefficient for motivation is inconsistent with the findings of Cano (2006).

In 2006, Cano found that all the variables in the affective strategies subset and the goal strategies subset were higher than the variables in the comprehension monitoring strategies subset, with the exception of self-testing. In the current study, results yielded inconsistent findings than Cano (2006). The model for quiz/test scores, concentration,
anxiety and selecting main ideas all yielded lower beta coefficients than the other two variables of comprehension monitoring (information processing & study aids). However, the other four variables of affective strategies and goal strategies (time management, motivation, attitude, and testing strategies) yielded greater beta coefficients than all of the variables in the comprehension monitoring strategies subscale; which is consistent with the Cano (2006).

Overall, the findings were consistent with the expected outcomes of this study based on the Cano (2006) factor analysis of the LASSI. The data generally showed that LASSI subscales in the affective strategies, goal strategies factors were higher that those included in Cano’s comprehension monitoring strategies factors. However several of the affective and goal subscales resulted in the negative beta weights. Future research in should include Cano (2006) three factors with more participants.

Statistically, this study determined that motivation was significant in four out of five academic predictor variables. This is relevant to the CARE program, SSSP, and instructors. By using the SIM model in portions or in its entirety with the LASSI, programs similarly to CARE and SSSP can create ways to predict and increase academic success in their students.
APPENDIX A

SSSP MID-TERM REPORT

CENTER FOR ACADEMIC RETENTION AND ENHANCEMENT
5400A-UNIVERSITY CENTER, FSU, TALLAHASSEE, FL. 32306-2470
PHONE 644-9699

MID SEMESTER GRADE REPORT

STUDENT: COMPLETE & SUBMIT THE INFORMATION BELOW TO YOUR INSTRUCTOR

NAME: ____________________________________________ SSN: ___/___/___*
LOCAL ADDRESS__________________________________________ PHONE: __________________ EMAIL: ____________________________
INSTRUCTOR’S NAME:________________________ COURSE:________________________ COURSE TITLE:______________________________________________________________
SECTION:__________________ SEMESTER: FALL______SPRING____________________

INSTRUCTOR: THE STUDENT LISTED ABOVE IS ENROLLED IN THE STUDENT SUPPORT SERVICES PROGRAM (SSSP); WHICH IS HOUSED IN THE CARE OFFICE. SSSP PROVIDES STUDENTS WITH ACADEMIC SUPPORT SERVICES DESIGNED TO INTRODUCE STUDENTS TO THE RESPONSIBILITIES AND OPPORTUNITIES OF COLLEGE LIFE, ENCOURAGE DEVELOPMENT OF USEFUL STUDY HABITS, AND ASSIST STUDENTS IN RECOGNIZING THEIR POTENTIAL FOR SUCCESS. WE ARE REQUESTING YOUR ASSISTANCE TO HELP US SERVE THE STUDENTS BETTER BY INDICATING HIS OR HER PERFORMANCE IN YOUR CLASS. PLEASE RETURN THIS COMPLETED FORM TO THE CARE OFFICE AS SOON AS POSSIBLE BY MAIL (MAIL CODE 2450) OR BY FAX (644-5435). IF YOU WOULD LIKE TO DISCUSS THE STUDENT WITH US PERSONALLY, PLEASE CONTACT MR. JOVANY FELIX OR MS. YARBRAH PEEPLES AT 644-9699.

MID SEMESTER PERFORMANCE

STUDENT’S PROGRESS IS: (PLEASE CIRCLE ONE)
EXCELLENT   ABOVE AVERAGE   AVERAGE/SATISFACTORY   UNSATISFACTORY
A+/A-                      B+/B-                                C+/C-                                    D- OR BELOW

PLEASE RATE THE FOLLOWING:
CLASS ATTENDNCE:             EXCELLENT     GOOD     POOR
ASSIGNMENT COMPLETION:       EXCELLENT     GOOD     POOR
QUIZ/TEST SCORES             EXCELLENT     GOOD     POOR

DO YOU RECOMMEND TUTORIAL SERVICES?      YES                NO

FURTHER COMMENTS:
________________________________________________________________________
________________________________________________________________________

INSTRUCTOR SIGNATURE_________________________________ DATE_______________
APPENDIX B

HUMAN SUBJECTS COMMITTEE APPROVAL MEMORANDUM

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 3/20/2009

To: Lance Lawson

Address: 24718 NW 30th PL Newberry, Florida 32669
Dept.: SPECIAL EDUCATION & REHABILITATION COUNSELING

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
THE LEARNING AND STUDY STRATEGIES INVENTORY AS A PREDICTIVE MEASURE OF 1ST SEMESTER ACADEMIC PERFORMANCE OF AT-RISK STUDENTS

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR § 46.110(7) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 3/18/2010 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the
protocol. A protocol change/amendment form is required to be submitted for approval by
the Committee. In addition, federal regulations require that the Principal Investigator
promptly report, in writing any unanticipated problems or adverse events involving risks
to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor
is reminded that he/she is responsible for being informed concerning research projects
involving human subjects in the department, and should review protocols as often as
needed to insure that the project is being conducted in compliance with our institution
and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection.
The Assurance Number is IRB00000446.

Cc: Bruce Menchetti, Advisor
HSC No. 2009.2381
<table>
<thead>
<tr>
<th>SCALES</th>
<th>BRIEF SCALE DESCRIPTION</th>
<th>LOW SCORE SUGGESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK - Skill</td>
<td><strong>Information Processing</strong></td>
<td>Students who score low on this measure need to learn how to incorporate and organize their thinking and to understand and recall.</td>
</tr>
<tr>
<td>W - Will</td>
<td><strong>Selecting Main Ideas</strong></td>
<td>Students who score low on this measure need to learn how to identify important information so that they can focus their attention and information processing strategies on appropriate material.</td>
</tr>
<tr>
<td>SR - Self-Regulation</td>
<td><strong>Test Strategies</strong></td>
<td>Students who score low on this measure may need to learn more about how to prepare for tests, how to create a plan of attack for taking a test, the characteristics of different types of tests and test items, and how to reason through an answer.</td>
</tr>
<tr>
<td></td>
<td><strong>Attitude</strong></td>
<td>Students who score low on this measure need to work on higher goal setting and reassess how school fits into their future.</td>
</tr>
<tr>
<td></td>
<td><strong>Motivation</strong></td>
<td>Students who score low on this measure need to work on goal setting for individual tasks and assignments.</td>
</tr>
<tr>
<td></td>
<td><strong>Anxiety</strong></td>
<td>Students who score low on this measure (indicating high anxiety) need to learn techniques for coping with anxiety and reducing worry so that they can focus on the task, not their anxiety.</td>
</tr>
<tr>
<td></td>
<td><strong>Concentration</strong></td>
<td>Students who score low on this measure are less successful at focusing their attention on the task at hand by eliminating interfering thoughts, emotions, feelings, and situations. They need to learn techniques to enhance concentration and set priorities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(SR) TIME MANAGEMENT</th>
<th>(SR) SELF TESTING</th>
<th>(SR) STUDY AIDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT</td>
<td>SFT</td>
<td>STA</td>
</tr>
<tr>
<td>Students' scores on this scale measure the degree to which they create and use schedules.</td>
<td>Students' scores on this scale measure their awareness of the importance of self-testing and reviewing the degree to which they use these methods.</td>
<td>Students' scores on this scale measure their ability to use or create study aids that support and increase meaningful learning and retention.</td>
</tr>
<tr>
<td>Students who score low on this measure may need to learn how to cope with distractions, competing goals, and procrastination.</td>
<td>Students who score low on this measure need to learn more about the importance of self-testing and reviewing the school material and to monitor their comprehension.</td>
<td>Students who score low on this measure may need to learn more about the types of study aids provided in educational materials and classes and how they can create their own aids.</td>
</tr>
</tbody>
</table>
Candidate Application

Name: ___________________________   S.S. #__________________

Local Address: _____________________________________________________

City: ____________________   State: _________ Zip: ______________

DOB: ______/____/____   Race: _____________________

Home Phone Number: _________________   E-mail: _________________________

Cell Phone Number:____________________

Please answer all of the following questions to the best of your ability and return to the CARE office, along with a copy of your parent’s 2008 tax return.

1) How many people are there in your family? __________
   (The number listed on your parent’s tax return)

2) Has either of your parents received a BA/BS college degree?
   Yes        or        No

   If yes, then which parent: __________________________

   Major: ______________________

3) What is your current High School GPA? __________

4) If currently attending FSU, what is your GPA? __________
5) If you are a transfer student, what community college/university are you currently attending? _________________________

Are you currently active with SSSP there? __________

6) Are you a participant in Upward Bound, Talent Search, or CROP? ______

If so, who is the director of that program? ______________________

7) Do you currently have a job?

Yes        or        No

If yes, where do you currently work: _________________________________

8) How many hours per week do you work? __________________________

9) Do you have on campus housing in the fall?   Yes       or       No

If no, then where will you be living: _________________________________

10) What is your intended major/minor?

____________________________________________________________

11) Please list below any additional information you feel we should know about you:

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

Student Signature               Date
*All student information gathered will be used for the purpose of program enhancement and evaluation*

<table>
<thead>
<tr>
<th>For Administrative Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Application Received:</td>
</tr>
<tr>
<td>US Citizen: Yes or No</td>
</tr>
<tr>
<td>Eligible for Program: Yes or No</td>
</tr>
<tr>
<td>Staff Initial’s:</td>
</tr>
</tbody>
</table>
REFERENCES


Stallworth-Clark, R., & Scott, J. S. (1996). *Academic performance comparisons among at-risk and other college students*


BIOGRAPHICAL SKETCH

Lance A. Lawson is a candidate for Bachelors of Science and Masters of Science in Exceptional Student Education for the Spring of 2009. Lance is currently working on his internship at Lincoln High School in Tallahassee, Florida.