DEVELOPMENT OF THE SCHOOL MOTIVATION AND LEARNING STRATEGIES INVENTORY

A Dissertation

by

KATHRYN CHATHAM STROUD

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2006

Major Subject: School Psychology

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Approved by:

Chair of Committee,	Cecil R. Reynolds
Committee Members,	Michael J. Ash
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ABSTRACT

Development of the School Motivation

and Learning Strategies Inventory. (May 2006)

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Chair of Advisory Committee: Dr. Cecil R. Reynolds

The goal of this project was to develop a self-report inventory designed to assess constructs associated with academic motivation and various learning strategies including study strategies, time management, organizational techniques, attention and concentration, writing and research skills, and test taking strategies. The School Motivation and Learning Strategies Inventory (SMALSI) was developed in two forms, Child and Teen, measuring 9 and 10 constructs, respectively. Following a survey of available literature, items were constructed, subjected to review and revision, and then field tested. Following analyses of internal consistencies, items were removed to improve construct coherence. Revised forms were prepared and administered to a standardization sample of 2921 students. Additional tests of internal consistency were conducted and final versions were prepared for publication. Analyses suggest adequate reliability for both forms of the SMALSI with great consistency across age, gender, and ethnicity. Validity was assessed for 23 students completing the SMALSI Child Form and 24 students completing the SMALSI Teen Form using the Behavior Assessment System for Children – Self-Report Profile. Student Liabilities scales were positively correlated with measures of emotional, academic, and social maladjustment. In like form, Student

Strengths scales were negatively associated with these measures. Interesting results were also obtained specifically regarding the relationship of depression to learning strategies. Validity was also assessed for 32 students completing the SMALSI Child Form and 53 students completing the Teen Form by obtaining Texas Assessment of Knowledge and Skills (TAKS) scores. Results for several of the constructs indicated small to moderate correlations in the expected direction. Guidelines for interpretation of the ten SMALSI constructs were presented along with suggestions for further investigation, including the use of clinical populations and standardized measures of achievement.

For Matt and Katelyn

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CHAPTER I

INTRODUCTION

Few will argue that one of the greatest accomplishments of childhood is the acquisition of a meaningful education. Success in school is dependent on numerous factors, many of which are not fully controllable or easily identified. It is important to identify variables that we can affect to improve learning. Among these, the development and use of efficient learning and study strategies as a child progresses through school, can be critical to academic success. However, assessment and identification of learning and study strategies is an uncommon enterprise and few good measurement devices exist.

Overview of Learning Strategies

What Are Learning Strategies?

One difficulty in developing an effective assessment measure has been the lack of a consensual definition of learning strategies. In addition, several terms (learning strategies, study skills, learning styles, and cognitive skills) are sometimes used interchangeably. Mayer (1988) defined learning strategies as "behaviors of a learner that are intended to influence how the learner processes information" (p. 11). Learning, however, is classically identified through changes in behavior inferred to signify that something new has been learned—learning strategies then are viewed more correctly as behaviors of a learner intended to affect how the learner acquires new information. The

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This dissertation follows the style and format of *Educational and Psychological Measurement.*

terms study strategies and skills are often used interchangeably with learning strategies. They may, however, refer to a more specific subset of behaviors that facilitate learning of presented material. Cognitive strategies, on the other hand, appear to encompass both learning strategies and study strategies used in the school learning environment as well as more global strategies used at work or home environments. Other conceptualizations of learning strategies and related terms will be discussed at a later point.

Interest in learning strategies has included elementary and secondary school students to a lesser extent than college students. After all, the importance of entering college ready to learn casts primary and secondary schools in the role of improving college preparation. However, assessment methods that are psychometrically sound and subsequent research on the effects of teaching study skills and learning strategies in elementary and secondary schools have been lacking. Research with these age groups, for the most part, has focused on particular strategies taught to specific groups of children. Although such information is valuable, the generalizability of those skills to other subjects and situations necessitates further investigation.

The most significant body of work specifically examining learning strategies has come from Claire Weinstein and her colleagues at the University of Texas at Austin. Based on the information processing model and the movement during the 1970s toward making students an active participant in learning, Weinstein and Mayer (1986) developed a taxonomy of learning strategies including five categories: rehearsal, elaboration, organization, comprehension monitoring, and affective strategies (Weinstein, Husman, & Dierking, 2000). A primary result of their research conducted as

part of the Cognitive Learning Strategies Project was the development of the Learning and Study Strategies Inventory (LASSI) for adolescents and college students (Weinstein, 1987; Weinstein 1994). The LASSI appears to be the most widely used measure of strategic learning in the literature, both in research and in clinical settings. The constructs measured by the LASSI and the model first proposed by Weinstein and Mayer (1986) fit well into current conceptualizations of self-regulated learning. Their strategic learning class has resulted in increases on a measure of reading comprehension, self-reports on the LASSI, and grade point average. Furthering the use of self-regulated and strategic learning, Weinstein has also developed an assessment of readiness for training to be used in the workplace. This diagnostic inventory uses constructs similar to the LASSI but more applicable to learning specifically for the workplace (Weinstein, 1994).

Need for an Assessment Measure

Specific Populations in Need of Learning Strategies

Students can and do benefit academically from learning effective study and learning strategies (Weinstein, 1994). Because of limited time for instruction, it is important to assess individual strengths and weaknesses in how students develop and apply learning strategies. Children with special needs or circumstances may need particular attention. Many children with disabilities have been argued to possess poor skills when it comes to knowing how to learn. Although few controlled studies exist, several researchers have asserted the need for specific educational interventions related to learning strategies with children who are survivors of childhood cancer (Jannoun & Chessells, 1987; Peckham, 1989) and also children with a traumatic brain injury. They

advocate for what is termed cognitive strategy training, or “learning how to learn” (Powers, Vanetta, Noll, Cool, & Stehbens, 1995). Similar recommendations have been made for children with Attention Deficit-Hyperactivity Disorder (DuPaul & Stoner, 1994), learning disorders (Scruggs & Mastropieri, 2000), and other psychiatric disorders (Brackney & Karabenick, 1995). Neuropsychological deficits can be wide-ranging, depending on the nature of the illness or injury. Therefore, accurate assessment of learning and study strategies is necessary to determine the nature of the deficits a child may have as well as strengths that may be used. This is particularly important for children and adolescents who may be receiving special services and whose time for intervention within the school is limited.

Students with a learning disability comprise approximately 7% of the current academic population and include more than 50% of the special education population (U.S. Department of Education, 1999). Learning disabilities are typically defined in terms of a discrepancy between measured intellectual ability and a specific area of achievement (Gersten, Fuchs, Williams, & Baker, 2001). However, such a description does not encompass the myriad of difficulties that frequently plague these students. It is clear that students with learning disabilities differ in their use of learning strategies as compared to their normal achieving peers. Students with learning disabilities display significant problems with memory on academic tasks (Scruggs & Mastropieri, 2000). They can benefit greatly from instruction in test-taking skills, including mnemonic strategies (Scruggs & Mastropieri, 2000). Reading comprehension strategies instruction has helped also to improve understanding of science and social studies texts (Bakken,

Mastropieri, & Scruggs, 1997). It has been the subject of debate in the literature whether such differences are due to a lack of knowledge of appropriate strategies, failure to use those strategies, or inefficient use of strategies. Depending on the task at hand, all three may be an issue for a given student. Given that students with learning disabilities have typically experienced failure in at least one area of academic achievement, factors including test anxiety (Glanz, 1994), motivation, and self-efficacy may also impact the use of strategies by students with a learning disability.

Learning Strategies and Related Constructs

The study of learning strategies encompasses numerous topics. The most common topics in the literature include academic motivation (Pajares & Urdan, 2002; Schunk, 1991), note-taking and listening skills (Armbruster, 2000; Bygrave, 1994; Hughes & Suritsky, 1994), time management (Britton & Tesser, 1991), test anxiety (Cassady & Johnson, 2002), research strategies (Quarton, 2003), concentration/attention (Rabiner & Coie, 2000; Reynolds & Shirey, 1988), organizational techniques (Ho & McMurtrie, 1991; Shapiro, DuPaul, & Bradley, 1998), test-taking strategies (Flippo, Becker, & Wark, 2000; Scruggs & Mastropieri, 1992), study strategies (Sweidel, 1996), and reading and comprehension strategies (Gersten, Fuchs, Williams & Baker, 2001, Nist & Holschuh, 2000). Other theoretical frameworks of learning strategies and their components are helpful for continued research and insight into the nuances of learning. However, the above-mentioned constructs provide concrete, distinct areas that can be targeted for direct and indirect teaching in different classroom settings. Proficiency in these areas has broad academic implications and may increase achievement in most, if

not all, subject areas. The relationship of each of these topics to academic achievement has been empirically supported. Therefore, all of these topics must be considered in order to better understand the development and selective use of cognitive strategies. A brief description of each construct as it relates to learning and study strategies follows.

Note-taking and listening skills. Note-taking skills as well as text marking strategies are specific learning strategies associated with the ability to discern important versus non-important information. Research examining the utility of note-taking takes two approaches. One looks at note-taking from the perspective of information processing while the other focuses on the product of note-taking skills when reviewing. Use of note-taking strategies has generally been supported although some differences are seen between students with low ability and students with high ability (Shrager & Mayer, 1989; Kiewra & Benton, 1985; Wade & Trathen, 1989). Note-takers can differ in their ability to take effective notes, relate new information to that already learned, make note-taking an active process, and determine priorities of relevant information (Faber Morris & Lieberman., 2000).

Writing-research skills. As the name suggests, research skills are the skills necessary to complete increasingly complex research tasks in the library. Writing skills are increasingly integral to academic success as a child progresses through school. As children are encouraged early in life to use libraries to increase general reading skills and interest in reading, they should be learning basic skills to use other aspects of the library. Resources available in libraries can include internet resources, reference books and materials, audio/video materials, archival documents, and others. Traditional library

skills curriculums that taught students the Dewey Decimal System now must teach students how to use many other tools including the use of computers for research (Quarton, 2003).

Organizational techniques. Organizational strategies refer to specific techniques used to organize materials to be learned. They can include being prepared for class and keeping daily assignments in a designated place as well as effectively organizing learning materials to complete an assignment. Training designed to improve organizational ability has been recommended in particular for students with Attention-Deficit/Hyperactivity Disorder (Shapiro et al., 1998).

Test-taking strategies. Test-taking strategies are specific strategies used when taking a test. These are performance-based strategies rather than focusing on information processing or initial learning. These strategies have been shown to significantly increase performance on standardized and classroom tests for special populations including students with learning disabilities (Scruggs & Mastropieri, 1992). They include techniques such as eliminating unlikely choices and learning how to guess.

Reading and comprehension strategies. Reading and comprehension strategies are considered essential components of successful study strategies curriculums. Perhaps more than any other, such strategies are increasingly necessary as a child progresses through school. Such techniques include previewing texts, self-questioning, and mapping ideas (Miranda, Villaescusa, & Vidal-Abarca, 1997; Paris & Oka, 1989).

Study strategies. Study strategies are those specific to reviewing and learning material. These strategies target how students select and encode information. Mnemonic

strategies have proven useful for helping students encode and recall information (Scruggs & Mastropieri, 2000).

Time management. Time management is a self-regulatory or metacognitive technique that involves discerning the most efficient ways to use time. It is emphasized as students enter college because they have left the supervision of their parents and have many more choices in how they spend their time. However, learning these skills early can impact students' motivation to complete tasks, increase self-efficacy, and ease the transition to progressively less externally structured (i.e., parent restrictions, high school periods) environments. Ultimately, these skills will impact the person's efficiency in the workplace (Macan, 1994).

Concentration/attention. Integral to the use of effective learning strategies and self-regulated learning are factors of attention (Schunk & Zimmerman, 1998). Reynolds and Shirey (1988) asserted that strategies are dependent upon the processes of identifying important information, allocating attention, and monitoring comprehension. Attentional difficulties in the classroom as well as during study activities or testing situations can result from a variety of environmental and personal factors. Observational learning requires attending to "relevant environmental events" that are "necessary for them to be meaningfully perceived" (Schunk & Zimmerman, 1998, p. 142). Without intervention, attention problems in the classroom can affect emotional adjustment as well (Borden, Brown, Jenkins, & Clingerman, 1987).

Test anxiety. Test anxiety has been associated with poor organizational skills and other learning and study strategies (Hembree, 1988). Several theoretical constructs have

been proposed in the measurement of test anxiety. The most widely accepted theories have delineated two traditional components of test anxiety, worry and emotionality, first suggested by Liebert & Morris (1967). Although additional components have been proposed, these have been most widely studied in the literature. Worry, which is characterized by debilitating intrusive thoughts, has been most associated with poor academic performance (Cassady & Johnson, 2002). Newer integrative models of test anxiety include cognitive or attentional deficits, social learning factors, and poor study habits (Jones & Petruzzi, 1995). Another approach has been to develop instruments focusing specifically on the worry (also called cognitive) construct, given its greater correlation with academic achievement (Cassady & Johnson, 2002).

Academic motivation. Dembo and Eaton (1996) define motivation as "an internal state that arouses, directs, and maintains behavior" (p. 68). They discuss internal factors of motivation in terms of three components: (a) expectancy, or the student's attributions and self-efficacy for success/failure (b) value, or the importance placed on the task, and (c) affective, or the emotional processes associated with the learning situation. Motivation determines investment in the process of learning, which strategies are used, and the amount of effort put into carrying them out. In addition, understanding academic motivation helps to explain the differential use of learning strategies, both between students and in one student across learning situations. It involves the students' attributions for success and failure as well their achievement goals and perceptions about incentives (Karabenick & Collins-Eaglin, 1997).

Existing Inventories

Volume Four of *Tests in Print* (Murphy, Conoley, & Impara, 1998) lists seventeen study and/or learning skills inventories currently in print. Publication dates range from 1953 to 1990 and target populations vary from 9 years 0 months to adult. Six instruments include junior high ages, and eleven include measures for high school students. Twelve include adult populations. Only seven measures target age populations ranging over five years. No existing inventories measure study strategies and learning strategies and cover elementary, junior high, and high school students.

The most widely used learning strategies inventory is the Learning and Study Strategies Inventory (LASSI), developed by (Weinstein, 1987). Weinstein, Zimmerman, and Palmer (1988) identify three historic purposes for such an inventory: "(1) prediction of academic performance, (2) counseling students concerning their study practices, and (3) and screening or criterion measures for study skills courses" (p. 26). They proposed additional purposes for the development of the Learning and Study Strategies Inventory (LASSI) which included: assessment of a wide variety of topics related to and including learning strategies with sound reliability and validity, assessment of behaviors that could be changed, representing current research in cognitive psychology, and use as a diagnostic instrument (Weinstein et al., 1988). The LASSI is intended for use with high school and college students.

Purpose

While research on learning strategies is abundant with college-age students, far fewer studies have been conducted with secondary students, and more scarce still are

findings with elementary age students. Much of the research that currently exists for younger students is isolated to specific approaches in particular settings, rather than being derived from a cohesive construct or theory. Many times, the findings of research with college-age adults are used to make conclusions regarding the functioning of children. Without such cohesiveness, it is difficult to draw conclusions regarding the effectiveness and generalizability of an approach. Secondly, measures do not currently exist that cover the broad range of factors associated with learning strategies from elementary school through high school. Therefore, it is difficult to understand the developmental nature of learning strategies throughout these formative years. Also, such a measure should provide constructs that are operationally defined and transferable to tangible recommendations for instruction in the classroom. Finally, given the role that individual differences appear to play in the effectiveness of interventions, it is very important to have a diagnostic tool for use to understand what strengths and weaknesses a particular student possesses. Some interventions may be more or less effective, depending on how the student is currently functioning with regard to knowledge of learning strategies, academic motivation, and test anxiety.

It is the purpose of the present study to develop an inventory that meets each of these needs. Following a thorough review of literature and selection of appropriate constructs, an initial item pool was developed. An item review was conducted to eliminate items that did not assess changeable behaviors and duplicate items. After the item review, a pilot test was conducted. Pilot tests were administered in group format in several schools. Following initial item tryouts, items were evaluated in terms of their

correlation to students' scores on standardized achievement measures and to standardized behavior rating scales. Items were evaluated for their internal psychometric characteristics based on classical test theory as well. Final revisions were made and the inventory was standardized on a national sample. Primary questions were the following:

1. Is the SMALSI a reliable and valid measure of each of the constructs proposed?
2. What is the developmental nature of the constructs measured?

CHAPTER II

LITERATURE REVIEW

Introduction

The proliferation of research on learning strategies may lead one to think that they are a recently developed concept. However, McKeachie (1988) has provided an overview of the evolution of the teaching of learning strategies over a number of years, particularly at the college level. A study class was offered at Wellesley College as early as 1894. Classes offering to teach students learning and study strategies have become commonplace at most universities in order to provide remedial help for students who have not been taught and/or have not sufficiently developed such skills. McKeachie (1988) has offered several reasons for the growing need in recent years for these classes. The number of people entering college has been actually leveling off and even decreasing; therefore, from a financial standpoint, it has been imperative that universities increase their recruitment and retention of students. Such courses offer instruction in both cognitive and metacognitive learning strategies. Topics range from time management to specific note taking techniques to organizational approaches to learning. Annis (1986) asserted that the most successful college level study strategies courses included reading effectiveness training, note-taking and text-marking instruction, time management, and test-taking skills. Also, minority groups are entering college in increasing numbers, yet many have not been prepared for college-level work (McKeachie, 1988). Finally, interest in having college athletes obtain a meaningful

college education has contributed to an interest in learning strategies and ways to optimize the teaching of such skills (McKeachie, 1988).

Perhaps due to these increasing needs, studies of the use and efficacy of learning strategies in the 1970s came from a wide variety of theoretical perspectives, including information processing, developmental, behavioral, applied behavior analysis, and social learning theories (Gerber, 1983). As a result of these earlier influences, the concept of learning strategies has changed over the past quarter of a century. In particular, as social cognition theories gained momentum in the 1970s, theorists began to see students as active participants in learning process. As such, they have control over the effort they put into learning, the value they give a particular learning task, and the strategies they use to encode, process, and retain relevant information. In recognition that learning strategies do not impact learning in isolation, studies have investigated their relationship to a number of variables that effect academic learning. As the concept of self-regulation has developed, the use of learning strategies (or cognitive strategies) has fit neatly into the framework of self-regulatory learning.

While much research on cognitive learning strategies exists and numerous remedial programs have been developed, few researchers have proposed a theoretical model for cognitive strategies as they relate to other variables that influence learning. Weinstein and Mayer (1986) developed a taxonomy of learning strategies that included the following categories: rehearsal, elaboration, organization, comprehension monitoring, and affective strategies. Rehearsal, elaboration, and organization each involve specific techniques that are used to promote organizing and learning

information. Comprehension monitoring involves the learner's metacognitive awareness of learning and ability to control the use of strategies (Weinstein et al., 2000). Affective strategies are used to "help focus the learner's attention and maintain the learner's motivation" (Weinstein et al., 2000, p. 732). As Weinstein et al. (2000) asserted, this model makes clear the notion that strategies do not exist in isolation. Rather, they are intertwined with other factors, including motivation and metacognition. Weinstein and colleagues have since expanded their view of cognitive strategies to provide a more comprehensive model. Weinstein's "model of strategic learning has at its core the learner: a unique individual who brings to each learning situation a critical set of variables, including his or her personality, prior knowledge, and school achievement history" (Weinstein et al., 2000, p. 733). This model includes three components: skills, will, and self-regulation. The skill component encompasses the learner's knowledge about himself/herself as a learner, characteristics of the academic task, learning strategies, prior knowledge, and learning content as well as skills in the use of learning strategies, identifying important information, reading and listening comprehension, listening and note-taking, study and test-taking skills, and reasoning (Weinstein, 1994). The will component includes the following: development and use of goals, academic motivation, affect regarding learning, beliefs, volition, and a positive mindset toward learning. Finally, self-regulation in the context of strategic learning involves time management, concentration, monitoring comprehension, a systematic approach to learning and accomplishing academic tasks, coping with academic stress, and managing

motivation (Weinstein, 1994). Weinstein and colleagues have used the Model of Strategic Learning to teach their course in strategic learning at the University of Texas.

While Weinstein's theory of learning strategies subsumes self-regulated learning, theories of self-regulation likewise encompass learning strategies. Theories of self-regulated learning have the same origins in cognitive psychology as learning strategies. The concept has been the subject of numerous studies on learning and several books in the last decade. Self-regulated learners are strategic and goal-oriented in their approach to learning tasks. They monitor and adapt their learning according to the situation at hand. They rely on intrinsic self-control of the situation rather than merely reacting to external controls (Purdie, Hattie, & Douglas, 1996). Zimmerman (1998) described the learning process as occurring in three cycling phases: forethought, performance or volitional control, and self-reflection. Each of these phases is, in turn, divided into subprocesses. Forethought includes setting goals, strategic planning, self-efficacy beliefs, goal orientation, and intrinsic interest. The performance phase involves attention focusing, self-instruction, and self-monitoring. Finally, self-reflection is characterized by self-evaluation regarding performance, attributions for success/failure, positive or negative self-reactions, and appropriate adaptation (Zimmerman, 1998). According to their performance in each of these domains, learners have been described as skilled or nonskilled learners, differing significantly in their approach to learning tasks. For example, in the forethought phase, Zimmerman cited Pintrich & DeGroot (1990), who suggested that skilled self-regulators more often had a mastery orientation, or an intrinsic desire to improve their ability while non-skilled learners typically demonstrated a

performance orientation, or learning in response to threatened evaluation. Other differences suggested in this phase include nonspecific distal goals vs. specific hierarchical goals, low self-efficacy vs. high self-efficacy, and disinterested attitude vs. interested orientation. Zimmerman also identified key differences in unskilled vs. skilled performers in the performance phase, including unfocused or divided focus vs. a focus on performance, use of ineffective (handicapping) strategies vs. self-instruction or strategic learning, and monitoring of outcome vs. monitoring of success. Finally, self-reflection for skilled learners involves self-evaluation which leads to appropriate attributions for strategies used. Consequently, this creates positive self-reactions and an adaptive approach to subsequent tasks and differing situations (Zimmerman, 1998).

Winne and Hadwin (1998) also have proposed a model of self-regulated learning. Their model depicts self-regulated learning as an event with four phases. First, the task must be defined. Second, a student sets goals and devises a strategy for achieving them. Next, tactics and strategies are used. Finally, the fourth phase allows the student to monitor, evaluate, and make changes as needed.

Measurement of self-regulated learning has taken many forms. Winne and Perry (2000) reviewed measures according to their measurement of self regulated learning as an aptitude and as an event. They have found that self-regulated learning is most often measured as an aptitude by self-report measures. Two measures commonly used are the Learning and Study Strategies Inventory (LASSI: Weinstein, Schulte, & Palmer, 1987) and Motivated Strategies for Learning Questionnaire (MSLQ: Pintrich, Smith, Garcia, & McKeachie, 1991; Winne & Perry, 2000). Other methods of measuring self-regulated

learning as an aptitude include structured interviews and teacher judgments. Researchers have measured learning as an event by using think aloud procedures, error detection tasks, trace methodologies, and observations.

Definitions

What are learning strategies and how to they differ from similar theoretical constructs? One difficulty in developing an effective assessment measure has been the lack of consensual definition of learning strategies. In addition, several terms (i.e., learning strategies, study skills, learning styles, cognitive skills) are sometimes used interchangeably. Therefore, clarifying the meaning of such terms is important when discussing constructs in terms of diagnostic purposes. Learning styles have been defined as "characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1979, p.4). Schmeck (1988) looked at learning styles in comparison with learning strategies saying that learning styles indicated a tendency to use a certain repertoire of strategies for learning. Learning styles may be more dependent on the preferences of the learner, whereas learning strategies are more universal and necessary in their ability to increase learning.

Learning strategies are comprised of a number of tactics. Consider the following definitions of learning strategies. Mayer (1988) defined learning strategies as "behaviors of a learner that are intended to influence how the learner processes information" (p. 11). Tobias (1982) viewed learning strategies as macroprocesses that aid microprocesses such as intellect and thinking skills. Others have described learning strategies in terms of

deep and surface strategies. Deep strategies are used for the purpose of understanding meaning whereas surface strategies are used to memorize or reproduce material, most often with the purpose of obtaining good grades (Graham & Golan, 1991; Somuncuoglu & Yildirim, 1999).

The terms study strategies or skills are often used interchangeably with learning strategies. For example, Gall, Gall, Jacobsen, and Bullock (1990) acknowledged the similarity of their definition of study skills to that of learning strategies, but they state that they prefer the term study skills because of its popular use with educators. Educators even distinguish between the terms study skills and study strategies, asserting that study skills are specific steps in a task, while study strategies are a more global approach to a learning task (Gettinger & Siebert, 2002). Even study strategies, however, appear to refer to a specific subset of behaviors that facilitate learning of presented material whereas learning strategies would encompass approaches to many areas of learning (i.e., reading comprehension, writing, note-taking). Cognitive strategies, on the other hand appear to encompass both learning strategies and study strategies used in the school learning environment as well as more global strategies used in work or home environments. In recent years, cognitive strategies and learning strategies have come to be used almost synonymously in the literature. Garner (1988) defined cognitive strategies simply as those intended to “make cognitive progress” (p. 63). A related term, metacognitive strategy, is a strategy designed to “monitor cognitive progress” (p. 63).

Garner (1988) described several characteristics necessary to be considered strategic. First, strategic behavior is considered to be a sequence of activities. It is

important to consider strategic behavior as a group of smaller behaviors rather than one event when examining the differences between groups. Secondly, strategic behavior can be controlled by the learner. Next, a strategy must be flexible and used based on its level of effectiveness in a given situation. It is metacognitive strategies that monitor and direct this flexibility of use.

Specific Learning Strategies

Gall et al. (1990) listed seven learning tasks requiring instruction in study skills: These tasks are: getting organized, following school rules and procedures, using time management, listening in class, reading assignments, writing papers, and preparing for tests. Several studies have determined that high achieving students and/or gifted students are more likely than low achieving to employ self-regulated learning strategies considered to be effective (Zimmerman & Pons, 1986; Zimmerman & Pons, 1990). These included: organizing, goal setting and planning, environmental structuring, rehearsing/memorizing, reviewing texts, and reviewing tests.

Study Strategies

Students need to be able to develop a strategy and apply it as well as to identify important information, to make associations when learning, to use a variety of resources when a concept is not understood, and to use strategies for memory and encoding. Students receive an enormous amount of information in the course of days and weeks of schooling. Being able to select and arrange information according to a valid hierarchy is crucial to developing effective study strategies. Having a systematic, strategic approach

to studying is important to learning as well. The importance of having strategies for studying and learning is difficult to overstate:

> …there is no way that learning in science, history, English and language arts, or any other academic domain can be advanced without the attainment of skills and strategies for acquiring, remembering, organizing, or transforming information… (Alexander & Murphy, 1999, p. 173).

Research indicates that students perform better academically when they are taught strategies for studying and learning as well (e.g., Alexander & Murphy, 1999; Paris & Winegrad, 1990). Teaching strategies for organizing concepts for learning from different sources such as class notes, textbooks, and worksheets or homework, as well as memory aids should be included in general learning strategies approaches. Such rehearsal, elaboration, and organizational strategies are essential for acquiring and using information in a meaningful way and can be taught in a group or individual setting (e.g., Weinstein & Hume, 1998).

Gettinger and Seibert (2002) pointed out four aspects of studying that make it a unique academic task. First, it is skillful. It requires instruction for acquiring and retaining important information. Studying is also a purposeful or intentional task that requires effort. Next, unlike the classroom where much learning takes place as a group or with some sort of social interaction, studying is an individual process that is highly dependent on the characteristics of the student. Fourth, studying relies heavily on self-regulation or monitoring.

Study strategies would primarily include those used to aid in storing and retrieving information. Mnemonics have become a popular method for remembering information for later recall. Three types include letter (i.e., acronyms and acrostics), keyword (relating new material to a familiar word that can be visualized to help remember the new information), and pegword (ordered information is connected using rhyme and pictures) (Kleinheksel & Summy, 2003). Mnemonics are very helpful tools for remembering information or necessary steps for other types of learning, particularly for special populations such as students with behavioral and emotional difficulties (Mastropieri & Scruggs, 1998). They are essential for transferring information from working memory to long term memory (Goll, 2004).

Beidel, Turner, and Taylor-Ferreira (1999) taught study skills and test-taking skills to elementary students. Students were asked to spend an extra 20 minutes per night studying once their homework was finished. They were taught the SQ3R method (Survey, Question, Read, Recite, Review) for completing their assignments. Test anxiety decreased while academic achievement increased.

Note-taking/Listening Strategies

Note-taking begins in later elementary years and becomes a very important skill in secondary school and college as class sizes increase and the preferred method of instruction becomes teacher lecture. Note-taking skills as well as text marking strategies are specific learning strategies associated with good listening skills and the ability to discern important versus non-important information. Rather than verbatim recording of information presented, effective note-taking often requires manipulating information or

reconstructing it in a way that is most meaningful for efficient learning (Porte, 2001). Important strategies include teaching students how to become aware of their listening ability, understand common barriers to listening, and listen to directions and discriminate information. Forster and Doyle (1989) taught a structured listening skills curriculum over the course of 4 to 6 weeks of instruction to students with learning disabilities and behavioral impairments.

Earlier research examining the utility of note-taking has taken two traditional approaches. One looks at note-taking from the perspective of information processing while the other focuses on the product of note-taking skills when reviewing (Kiewra, 1985). From an information processing perspective, research focuses on the process or actual recording of information. Many studies have been conducted to determine whether it is the encoding process that is constructive in increasing achievement. This would be assessed by comparing students who do take notes with students who do not take notes on a given measure (Kiewra, 1985). The “product” or “external storage” perspective views the utility of note-taking in terms of whether it improves achievement by aiding in review of the information recorded. This second view would be assessed by comparing students who review their notes prior to assessment with those who are not given the opportunity to review their notes.

Meta-analyses conducted by Kiewra (1985) and Hartley (1983) indicated limited support for the efficacy of both the encoding and product functions of note-taking. Kiewra and his colleagues (1991) reported that 61 encoding studies were reviewed by at least one of these analyses. Of these, 35 supported encoding effects, 23 revealed no

significant differences from control groups, and 3 actually appeared to produce detrimental effects. Somewhat more heartening, of 32 product studies, 24 indicated positive effects of reviewing, while the remaining 8 studies failed to yield significant differences between groups. Use of note-taking strategies has generally been supported although some differences are seen between students with low ability and students with high ability (Shrager & Mayer, 1989; Kiewra & Benton, 1985; Wade & Trathen, 1989).

Note-takers can differ in their ability to take effective notes, relate new information to that already learned, make note-taking an active process, and determine priorities of relevant information (Faber et al., 2000). Kiewra, Mayer, Christensen, Kim and Risch (1991) demonstrated that students are able to shift their focus and the learning strategies they employ with repetition of lecture material. Their conclusion was that "students are active learners who have some metacognitive control over their learning strategies" (Kiewra et al., 1991, p. 123). Suritsky (1992) found that Learning Disabled students reported significant difficulties with note-taking. Specifically, the problems included recording notes with sufficient speed, focusing their attention on lectures, and using appropriate strategies such as a shorthand method.

Van Meter, Yokoi, and Pressley (1994) viewed note-taking from a self-management perspective. Rather than applying the theories of researchers (i.e., process, product), they were interested in college students' theories of note-taking. A series of interviews were conducted over the course of several stages. In all, 252 undergraduate students participated in one of five phases. Focus groups and individual interviews were used to gather information. While set questions were developed, open-ended responses,

elaboration, and new topics raised by students were allowed in order to generate as much information as possible regarding the nature of students' note-taking behaviors. Four note-taking categories were consistent throughout the study: goals for note-taking, the content or structure of notes, contextual variables that affect note-taking behaviors, and the use of notes after class. Various goals for students' note-taking included helping them attend to the lecture and use for subsequent review. Specific strategies used and the quality of the notes produced were reported by students to be affected by a lecturer's pace and style. Disorganized material and a fast pace were associated with difficulty taking notes. Students reported that their note-taking behaviors changed according to specific demands of a class (i.e., taking verbatim notes versus paraphrasing) and changed over the course of their time in college.

Despite the significant directions for future research suggested by Van Meter et al., 1994), subsequent research on note-taking has suggested that students may not be very proficient in their self-regulation of learning (Peverly, Brobst, Graham, & Shaw, 2003). Students who took notes and reviewed them scored higher on academic measures; however, they generally had a difficult time predicting their performance beforehand as well as estimating how well they performed after completing the tests. Students' relative background knowledge and macropropositions contained in their notes accounted for a significant amount of variance on test measures. No variables were predictive of the performance of participants who did not take notes. Peverly et al. (2003) suggested that students who processed the information likely had a better sense of what they knew as well as what they did not know.

Faber et al. (2000) pointed out that note-taking is a developmental process, particularly with respect to the role that students encode information as they hear and write it. They highlighted the importance of both encoding and external storage in learning. In the encoding process, the learner must process the new information and assimilate it with previous related knowledge. Self-questioning is also important to monitor comprehension and to make associations with other information (Faber et al., 2000). Given research suggesting that students gradually transition from using notes in a primarily external storage function to a more efficient use of encoding, Faber and his colleagues investigated whether younger students could be taught this more active encoding process. During nine weeks of instruction and practice, they taught ninth graders (a) how to apply prior knowledge to the current subject matter, (b) how to detect and write main ideas, and (c) how to monitor themselves for understanding. Particularly on low interest passages (text from their World Cultures class), students who were taught note-taking strategies performed significantly better as compared to peers who had not received this instruction. Of note, students with both high and low ability benefited from instruction in note-taking. Other methods used to help students develop complete and effective notes include learning shorthand, writing faster, previewing the subject before class, using guided notes provided by the teacher, and strategic note-taking that cues the student what questions to ask himself about the lecture (Boyle, 2001).

Reading Comprehension Strategies

Automating reading as a skill and increasing reading comprehension is critical to achievement in numerous academic subjects. Even most vocational pursuits involve, to some extent, getting information from written text or materials. Yet, through classroom observations, Durkin (1979) asserted that less than 1% of instructional time in reading was used for actual instruction in comprehension. Samuels (1989) stated that reading is an "active goal-directed problem-solving process in which the reader's task is to construct meaning from information contained in the text." (p. 3).

Chall (1983) proposed progressive stages of learning to read. The stages begin with prereading, or the development of oral language. It is in this stage that children begin to control language. In the next reading stage (Stage 1), children learn the concept that letters represent sounds and use sound-spelling relationships. Stage 2, or the confirmation and fluency stage, involves learning decoding skills and other comprehension strategies while increasing in fluency. Typically the transition from learning to read to reading to learn, or stage 3, occurs during later elementary and early secondary years. In this critical stage, students greatly expand their vocabularies, develop strategic habits, and use reading to build their background knowledge. Stages 4 and 5 typically occur during high school and college and involve critically analyzing material, understanding multiple points of view, and becoming proficient at using analytical and synthesis skills to construct their understanding of knowledge.

In recent years, many studies have examined variables that affect comprehension. These variables generally come from two sources: the characteristics of the text and the characteristics of the reader (Billingsley & Wildman, 1990).

Understanding the structure of text is considered a very important key to comprehension. The two main types of text are narrative and expository text. Having heard stories early in their life, young readers are more familiar with the structure of narrative text and its components. As they learn to read, they are already somewhat familiar with the structure and are looking for what might happen next. (Bakken & Whedon, 2002; Gersten et al., 2001). Students with reading disabilities often develop recognition of text structures, both expository and narrative, at a much slower rate than other children (Cain, 1996; Englert & Thomas, 1987).

Beginning in approximately the third grade, expository text plays an increasingly major role in providing new information to students in several different academic areas. According to Gersten et al. (2001), literature suggests that, with regard to expository text, (1) becoming aware of structure is a developmental process, (2) certain structures are easier and more apparent than others, and (3) the ability to recognize structure is an important determinant in comprehension. A crucial element in comprehension of expository text is recognizing the structure in which the information is presented. While in narrative text, generally one structure is followed, expository text can follow several different patterns. Main patterns that have been identified include: main idea structure, list structure, order structure, compare/contrast structure, and classification structure (Bakken & Whedon, 2002). Whereas a story generally follows one structure throughout,

expository text can change structures several times in a selection and often does not fit perfectly into a pre-specified category (Gersten et al., 2001). In addition to recognizing text structure, learning disabled students have difficulties related to poor vocabulary knowledge, limited background knowledge, poor reading fluency, and poor task persistence (Gersten et al., 2001).

Researchers have also studied the effects of working memory on reading comprehension. They have suggested that, while poor comprehenders do not demonstrate differences on short term memory measures, they do have significantly lower performance on working memory measures (De Beni & Palladino, 2000). De Beni and Palladino (2000) demonstrated that students with poor comprehension make more intrusion errors than their peers. Their recall of irrelevant information was, in fact, better than their recall of relevant information. Intrusion errors were a predictor of reading comprehension performance one year later.

Paris, Lipson, and Wixson (1983) proposed three types of knowledge necessary for effective reading strategy use. First, declarative knowledge is considered to be the characteristics or concepts of the task at hand. Procedural knowledge is the learner's understanding of how to execute the skill. Finally, conditional knowledge is the reader's concept of when and under what conditions to apply a strategy. In addition to these types of knowledge, Baker and Brown (1984) identified self-regulatory behaviors as components of metacognition during comprehension tasks. These self-regulatory behaviors include comprehension monitoring, or self-checking during reading in order to detect errors and monitor understanding, and comprehension regulation, or the active use

of strategies to help regulate the reader's comprehension. Billingsley and Wildman (1990) applied these areas of knowledge and self-regulation to develop metacognitive goals in reading.

Interventions. Given the importance of reading comprehension, it is no wonder that much effort has been invested in providing text enhancements as well as developing instructional programs for teaching effective strategies to students. Several features of text appear to be helpful in improving comprehension and retention of material (Mastropieri & Scruggs, 1997). Illustrations, including representational illustrations, imagery, spatial organization, and mnemonic illustrations can be beneficial. Representational illustrations and imagery may provide an additional mode of information to be encoded; however, to date, representational illustrations have produced small effect sizes while other interventions have demonstrated more utility. (Mastropieri & Scruggs, 1997). Teaching students to use a spatial organizer or providing such illustrations organizes information in a concise, visual manner for students to refer to. Advance organizers, which are used prior to reading to organize the material to be learned, can be helpful if the student already has the prerequisite knowledge to understand them (Mayer, 1987). Mnemonic illustrations can be an aid when committing material to memory (Scruggs & Mastropieri, 1992). Aside from illustrations, Mastropieri and Scruggs (1997) identified several adjunct aids that appear to improve comprehension. The thought is that these aids, including study guides, audiotapes, underlining, and semantic feature relationship charts help students to discern more important facts, providing an additional chance for encoding.

Mastropieri and Scruggs (1997) also discussed several different questioning techniques that have yielded promising results. While these strategies can be quite different, they each involve teaching students to improve their comprehension by questioning themselves before, during, or after reading. Mastropieri and Scruggs (1997) concluded that

> the following all facilitate the recall and comprehension of reading: (a) preteaching vocabulary and completing relevant group and independent work on the content, (b) presenting graphic or advance organizers containing the main ideas prior to reading the content and generating relevant questions, and (c) finding answers to questions about the story prior to reading (p. 204).

Providing questions prior to or embedded within the text can also cue students as to what information is most important and assist in later retention (Duchastel & Nungester, 1984; Pressley, Tanenbaum, Mc Daniel, & Wood, 1990) Summarization and main idea strategies have included techniques such as a student asking questions such as “Who” and “What’s happening” while reading, then summarizing the text in their own words (Gajria & Salvia, 1992; Jenkins, Heliotis, Stein, & Haynes, 1987). Use of these techniques has generally been effective. Summarization has also been combined with self-monitoring and attribution training, yielding positive results (Mastropieri & Scruggs, 1997).

One instructional approach that has increased academic performance was termed the Question Answer Relationship (QAR; Ezell, Hunsicker, & Quinque, 1997).

Developed by Pearson and Johnson (1978) and Raphael and Pearson (1985), QAR teaches students the need to use both their previously acquired knowledge and the information from the text. Students learn (a) how to locate information, (b) how to recognize text structures and how they present important information, and (c) deciding whether an inference is required or invited (Raphael, 1986). In their meta-analysis, Gersten et al. (2001) highlighted a study of QAR as being the study of a single strategy intervention that appears to have the most external validity. Simmonds (1992) instructed over 400 students, through their special education teachers, to recognize questions as text explicit, text implicit, or script implicit. Results indicated significant gains across several measures.

Ezell et al. (1997) compared teacher-assisted instruction of QAR to a peer-assisted procedure. Their results indicated no significant differences between the two methods of learning the strategy. One possible explanation offered to account for the similar performance was that both procedures encouraged active participation by the students. For example, in the teacher-assisted group, students' questions were used rather than teacher- or manual-generated questions. Students reported looking forward to seeing their questions used as an example for the class.

To help students recognize expository text, Bakken and Whedon (2002) recommended that teachers instruct students how to recognize these structures by looking for signal words or phrases, developing goals for understanding based on the purpose of the text, and selecting study strategies best suited for the structure. For example, an order structure, which presents a concept in sequence or steps, may be

recognized by signal words such as first, then, or next. The strategy would be to find and reword the general topic, then identify the steps in sequence and how each step is unique. Recognizing structures and using them to understand text has been helpful with adolescents following a seven-day training. These results were maintained following one week (Bakken as cited in Bakken & Whedon, 2002). In their study, this strategy was more effective than paragraph restatement and retelling the main idea and incidental information.

Gersten et al. (2001) found few studies of single or multiple strategies that demonstrated transfer or maintenance effects. This is a significant area of need in reading comprehension research.

Rosenshine, Meister, and Chapman (1996) conducted a review of studies teaching one type of procedural prompt – question generation strategies. Of the 26 studies included, 17 were interventions in which question generation was the sole strategy taught; the remaining 9 studies were reciprocal teaching studies that taught several cognitive strategies, one being question generation. They were interested, not only in the effectiveness of different types of prompts, but also in establishing the instructional methods most likely to be effective in teaching such strategies. The latter will be discussed shortly.

Five kinds of prompts were examined: signal words, generic question stems/generic questions, main idea, question types, and story grammar categories. Effect sizes obtained indicated that signal words and generic stems/generic questions were the most effective prompts used. Story grammar prompts were the third highest. The authors

suggested the effectiveness of these three types of prompts may be because they were easy to use, and they provided students with a guide and a way to focus their attention without requiring strong cognitive skills. While the other types of prompts were not as successful, Rosenshine and his colleagues (1996) felt that more intensive instruction might help to improve results. Use of generic questions were given more value than signal words "because they promote deeper processing, initiate recall of background knowledge, require integration of prior knowledge, and provide more direction for processing than might be obtained through the use of the more simplified signal words" (Rosenshine et al., 1996, p. 200).

With regard to measures of effectiveness, comprehension tests developed by researchers produced a much higher median effect size than standardized tests (Rosenshine et al., 1996). Possible reasons for this discrepancy offered were the nature of the text material and the apparent additional background knowledge necessary to answer standardized test questions.

Instructional methods. Nist and Holschuh (2000) offer a review of reading comprehension strategies for college students from an integrated theoretical perspective. In addition, they review strategies that may be taught to students as well as instructional methods that may be helpful. They also reiterate that the ultimate goal of teaching strategies to students is to help them reach the point that the goal of strategies is to be generative in nature. They should ultimately be transferred to new learning situations, and students should be able to change or modify their strategy use according to the situation.

While strategies have varied widely, Billingsley and Wildman (1990) identified instructional methods that appear to have most effective, regardless of the strategy being taught. These steps include the teacher (1) modeling the strategy to be learned, (2) providing guided practice and feedback regarding performance, and (3) gradually increasing the student's responsibility as he becomes more proficient at using the strategy. These steps are considered to be crucial in developing metacognition, particularly the student's understanding and control over learned skills. Strategies taught should include the following elements: "(1) What the strategy is, (2) Why the strategy should be learned, (3) How to use the strategy, (4) When and where the strategy is to be used, and (5) How to evaluate the use of the strategy" (Winograd & Hare, 1988, p. 123-124).

Rosenshine et al. (1996) described the instructional elements used in teaching question generation prompts in terms of scaffolding. "Scaffolding refers to the instructional support provided by a teacher to help students bridge the gap between current abilities and a goal" (p. 202). It is considered to be temporary and used during the beginning stages of learning. Nine major instructional elements were identified from the studies used in their metanalysis:

(1) Provide procedural prompts specific to the strategy being taught.

(2) Provide models of appropriate responses.

(3) Anticipate potential difficulties.

(4) Regulate the difficulty of the material.

(5) Provide a cue card.

(6) Guide student practice.

(7) Provide feedback and corrections.

(8) Provide and teach a checklist.

(9) Assess student mastery. (Rosenshine et al., 1996, p. 202)

While none of the studies he examined contained all of these elements, he described the relative gains to be made from incorporating them into the teaching of question generation strategies specifically and other cognitive strategies in general.

Writing/research Skills

Like reading comprehension, effective writing has become a benchmark for success in school. From a scholarly perspective, it is perhaps the best means of communicating understanding of concepts as well as one's ideas or feelings. As such, it has become a target for measuring academic achievement and is used as part of most state tests required for grade advancement or graduation. Writing strategies are so integral to success on these measures that the National Council for Teachers of English (NCTE) and the International Reading Association (IRA) included in their standards for writing the following: "Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes (Isaacson, 2004, p. 40)" A key element in learning complex material in particular (and in nearly every professional form of employment), writing and research skills become more and more crucial as students progress through school. Having students conduct research and then organize and present what they learn is one form of discovery learning, a process that tends to lead to improved

comprehension and recall (e.g., see Alexander & Murphy, 1999). Writing involves the "coordination and integration of multiple processes, including planning, production, editing, and revision. Composing requires prior knowledge of topic, genre, conventions, and rules as well as the ability to access, use and organize that knowledge when writing" (Montague and Leavell, 1994, p. 21).

Research skills are the skills necessary to complete increasingly complex research tasks using various resources. As children are encouraged early in life to use libraries to increase general reading skills and interest in reading, they should be learning basic skills to use other aspects of the library (Krapp, 1988). Resources available in libraries can include internet resources, reference books and materials, audio/video materials, archival documents, and others. Traditional library skills curriculums that taught students the Dewey Decimal System now must teach students how to use many other tools including the use of computers for research. Students today have ready access to information through the internet. In college, students will need to be able to effectively use scholarly databases to obtain the sources they need. Given the amount of resources at their disposal, it is more important than ever to teach students how to discern which sources are credible as well as how to effectively organize and narrow the information available (Quarton, 2003). These research skills are essential beginning skills in the process of writing. The process of writing begins long before the first words are written on paper.

Numerous descriptions of the writing process exist. Gall et al. (1990) pointed to several models. These include Neubert and McNelis (1986) and their conclusion that

writing has three steps – prewriting, drafting, and revision. Romano (1987) further delineated the writing process with five stages – percolating, drafting, revising, editing, and publishing. More specific still is the model proposed by Schumm and Radencich (1984). This model proposes 11 steps, including selecting resources, developing an outline, and writing and revising several drafts. Gall et al. (1990) pointed out that models of writing may focus on the thinking process of a writer while others consider observable behaviors to be more effective. They recommend 12 writing skills or steps necessary to write a paper:

> 1. Defining the writing task, 2. Specifying the paper topic, 3. Developing a writing plan, 4. Generating ideas, 5. Collecting information, 6. Organizing ideas into a plan for the paper, 7. Drafting the paper, 8. Getting feedback on the draft, 9. Revising the paper, 10. Editing the paper and producing a neat final copy, 11. Publishing the paper, and 12. Using the computer to write the paper (p. 150).

More recent models are similar to these, ranging in degrees of specificity (Tompkins, 1994). All involve some degree of planning and organizing information prior to writing, writing at least one draft, and revising drafts both for content and grammar before producing a final copy. While these models are presented in linear format, many steps may be revisited during the process.

Writing strategies help the writer throughout the writing process. During prewriting, students might plan their task by reading or interviewing others (Scott & Vitale, 2003). They might then collect information by brainstorming, answering

appropriate questions, using software, or reading more information (Roberts, 2002; Scott & Vitale, 2003). Information gathered would then be organized into a coherent plan or outline for writing (Scott & Vitale, 2003). In later steps, strategies would include narrowing the topic, recognizing the need for new information, or adapting a paper for a specific audience.

Hillocks (1986) conducted an extensive metanalysis of writing strategies. The findings, detailed in *Research on Written Composition: New Directions for Teaching* offered critical insight into effective instruction and use of effective composition strategies. His examination of the literature included more than 500 studies published between 1963 and 1982. Of these, 60 studies with 75 experimental treatments met the criteria for inclusion (i.e., the study must involve a treatment, employ a scale of writing quality rather than standardized tests, control for differences between groups). While only 60 studies were included in the metanalysis, many of the original pool of studies were included in his discussions of various topics integral to the writing process such as modes of instruction and different models used to define writing.

Results of the metanalysis yielded important information regarding modes of instruction and the focus of instruction (Hillocks, 1986). Hillocks described the most effective mode of teaching the writing process as *environmental*. This method of teaching was four times more effective than the far more common method of *presentational* teaching. It was also more effective than the *natural process* mode, which involves primarily student feedback and fails to have the teacher develop specific writing strategies. The environmental presentation method incorporates both of the other

modes while also emphasizing student involvement and structured problem-solving activities (Hillocks, 1986).

Results examining the focus of instruction again produced results in contrast to common practice (Hillocks, 1986). Traditional school grammar, which might arguably consume the most time in language arts classes, was determined to have no effect in improving quality of writing. Activities more effective than traditional or free writing included those of building more complex sentences as well as using and internalizing scales, criteria, or specific questions to generate material. The most effective activities were Inquiry treatments. Inquiry activities include those of analyzing data, problem-solving, and generating arguments.

Much of the research on writing strategies has been conducted with students identified as having Learning Disabilities. As with research in other learning strategies, and particularly with special populations, many studies involve very few participants. Students with learning disabilities frequently do not use writing strategies to the extent that nondisabled students do. They are not as purposeful in prewriting or revision and tend to focus on grammar, spelling, and handwriting (Faigley, Cherry, Jolliffee, & Skinner, 1985; Graham, Schwartz, & MacArthur, 1993). When given instructions to plan their papers and then write, LD students spent less than one minute on average prior to beginning their drafts (MacArthur & Graham, 1987). They tended to write without pausing to rethink or read what had been written (Faigley et al., 1985). Problems with written expression are in no way limited to children with Learning Disabilities, however; 23% of fourth graders are considered to be proficient at completing grade-level work and

only 60% had some of the skills necessary to work on grade-level (Greenwald, Persky, Ambell, & Mazzeo, 1999).

In order to gain an understanding of what affects students' use of good writing strategies, it is important to learn what their understanding of the writing process is. Do poor writers have the same perceptions about what makes writing good? Graham et al. (1993) queried students to ascertain their declarative, procedural, and conditional knowledge of writing. They were also interested in the differences between LD students and normally achieving peers with regard to self-efficacy and attitude in writing. They found that LD students were less likely than normally achieving peers to emphasize the process of writing or writing strategies as being important. When asked how they would modify their writing for a different audience, LD students were much more likely to stress surface level aspects of writing, whereas normally achieving students typically suggested changes to the substance of the material.

Several methods are used for assessing the effectiveness of writing strategy instruction (Graham & Harris, 1989; Harris, 1985). Measurements include looking for increases in the number of words written and the quality of the content, measures of self-efficacy with regard to writing, generalization and maintenance across settings and types of writing, measurement of the use of the strategy, and social validity of the instructional procedures.

Graham and Harris (1989) taught sixth grade LD students how to use a "strategy including a series of self-directed prompts that required them to (a) consider their audience and reasons for writing, (b) develop a plan for what they intended to say using

knowledge-of-discourse schemas or frames to generate and organize writing notes, (c) evaluate possible content by considering its impact on the reader, and (d) continue the process of content generation and planning during actual act of writing" (p. 202). Their sample size was quite small; however, significant gains were demonstrated in the number of functional elements included in essays. Furthermore, participants included all the basic elements of an essay on 10% of papers written prior to the intervention, but they improved to 80% following the intervention. Most importantly, measures of maintenance and generalization yielded promising results.

A larger sample of students with learning disabilities was taught self-regulated learning strategies including how to brainstorm, semantic webbing, setting writing goals, and revision (Chalk, Hagan-Burke, & Burke, 2005). The training, following the Self-Regulated Strategy Model developed by Graham and Harris (1996), yielded significant improvements in word production and quality of writing.

Graham, MacArthur, Schwartz, and Page-Voth (1992) examined the effectiveness of teaching students with learning disabilities how to set process and product goals prior to writing and to evaluate their success in achieving the goals following writing. Product goals could be one of three types: purpose (reason for writing the paper), specific goals related to structure, or fluency goals. Process goals were generated by the students with their product goals in mind. Gains were demonstrated with regard to inclusion of basic components, increased length, and making convincing arguments. Further, students also spent more time planning prior to and during the writing process.

Test-taking Strategies

Assessment is playing an ever-increasing role in accountability for schools. Several states have developed assessments as standards for progressing to the next grade and measuring minimum standards for graduation. Further, minimum performance on standardized tests remains a part of the requirements for acceptance at most colleges and universities. As such, educators, parents, and students have placed a premium on improving performance on tests.

While evaluating content knowledge is most often the objective of a test, several factors may, in fact, affect a person's score. These include the student's level of confidence, his motivation for success, and test-taking skills. Test-taking strategies are a set of skills that allow a student to recognize differences in test format and the entire testing situation in order to improve his or her score (Millman, Bishop, & Ebell, 1965). Six major types of test-taking skills have been identified, four of which can be applied to most testing situations. These include: time-using strategies, error avoidance strategies, guessing strategies, and deductive reasoning strategies (Millman et al., 1965). Intent consideration strategies and cue using strategies are more specific to a particular testing situation or test author.

Time-using strategies are those designed to make effective and efficient use of time during a test. Examples of such strategies might include monitoring time, answering questions you know, and not spending too much time on one item or one section. Error avoidance strategies are designed to minimize the points lost due to mistakes. They include accurately reading and understanding directions, accurately

selecting answers, and checking for mistakes. Guessing strategies are intended to increase a student's chance of answering a question correctly. Deductive reasoning strategies help a student arrive at an answer by using the item content, eliminating unlikely answers, and recognizing similar responses. Intent consideration indicates a student's awareness of the intent behind the test or individual item. Finally, cue using strategies involve the test-taker's understanding of the idiosyncrasies of the specific author (Mastropieri & Scruggs, 1992).

Mastropieri and Scruggs (1992) made a distinction between teaching test-taking skills and "teaching to the test". While test-taking skills can help to improve a person's test score by reducing the extraneous effect of test-taking, "teaching to the test" can inflate a student's score by teaching students the exact items to be included on the test. Some researchers have argued that there is a distinction between test-taking skills and test-wiseness (Millman et al., 1965; Scruggs, White, & Bennion, 1986; Towns & Robinson, 1993). Test-wiseness involves skills that would inflate the score obtained by a student based on his savvy in recognizing such things as grammatical cues and choosing the longer length option. The difficulty is that many researchers continue to use these two terms synonymously and various test-taking skills training programs can contain both. Furthermore, many researchers do not include specifics about the components of their programs, complicating comparisons of the effectiveness of skills taught (Scruggs et al., 1986).

Test-taking skills are used by all students to varying degrees. Special populations, such as students with learning disabilities and those with emotional and

behavioral disorders, often have significant deficits in the knowledge of these skills. It has been demonstrated that instruction in test-taking strategies can be helpful for all students, particularly special populations and minority students (Hughes, 1993; Scruggs & Mastropieri, 1986; Scruggs & Tolfa, 1985).

In their meta-analysis, Scruggs and colleagues (1986) determined small overall effect sizes for test-taking skills instruction. However, several differences appear to increase the effectiveness of an intervention. First, the length of intervention appears to have an impact on effectiveness. Studies with interventions lasting longer than four hours produced significantly higher effect sizes than those lasting less than four hours. Also, interventions appear to work better with older elementary children than younger children. When combining age and length of instruction, older children's performance is much less dependent on length of instruction than younger children. Older elementary children appear to benefit from even short instruction periods. Interestingly, they estimate that children of low socioeconomic status appear to benefit more than two times as much as their peers of higher socioeconomic status.

In their study, Scruggs and Mastropieri (1986) demonstrated the effectiveness of teaching test-taking strategies to students with learning disabilities or behavioral disabilities. Seventy-six third and fourth grade students were taught strategies that included "attending to directions, marking answers carefully, choosing the best answer carefully, using error avoidance strategies, and deciding appropriate situations for soliciting teacher attention" (Scruggs & Mastropieri, 1986, p. 65). Significant increases were obtained from pretest to posttest on the Stanford Achievement Test Word Study

subtest. This subtest appeared to be more amenable to changes due to the skills taught than the Reading Comprehension test. Researchers hypothesized that the skills required for these two subtests were different and that the skills needed for the reading comprehension subtest were more difficult to remediate.

In a much smaller study, Hughes (1993) taught eight middle school students identified as having an emotional behavioral disability test-taking strategies using a mnemonic device to help students remember the steps during a test situation. A mainstream class was used to obtain information about the students' ability to generalize their use of skills learned. Maintenance was observed up to 11 weeks following instruction, and general improvements were demonstrated on probe and classroom tests.

An interesting study conducted by Ellis and Ryan (2003) examined cultural differences in students' test preparation, test-strategy use, and self-efficacy and their effects on a cognitive ability test. Caucasians and African Americans both reported use of effective test-taking skills, but African Americans reported much more frequent use of ineffective strategies.

Related Constructs

Organizational Techniques

Organizational difficulties have been most notably discussed with regard to children with Attention-Deficit/Hyperactivity Disorder (ADHD). Certainly, children without ADHD have problems with organization to a lesser extent or to the same extent without the concomitant difficulties associated with the disorder. Zentall, Harper, and Stormont-Spurgin (1993) defined organizational behaviors as being able "to (a) plan and

manage activities within a time framework, (b) systematically arrange objects and assignments within space for rapid retrieval, and (c) structure an approach to a task" (p. 112). Zentall et al.'s definition of organizational behavior delineates three separate types of organization: idea, time, and object. Object organization is a student's ability to maintain his possessions, including supplies needed for schoolwork. Time organization is typically referred to as time management. Idea organization refers to the management and structure of academic information to be learned. In terms of intervention, each of these constructs is distinct. Time management will be discussed subsequently. Idea organization appears to be quite similar to strategies referred to as study strategies and reading strategies. For purposes of the organization scale on the SMALSI, object organization is the focus.

Organizational strategies refer to specific techniques used to organize materials to be learned. They range from being prepared for class to keeping daily assignments in a designated place. Teaching students basic techniques better prepares them for more complex organization tasks (Slade, 1986). Students with a strategy for organizing their work in various school and home environments are likely to be more effective and to have more time to devote to academic tasks. They are more likely to complete homework assignments and to turn in their work (Hughes, Ruhl, Schumaker, & Deshler, 2002). Object organizational strategies are essential to learning the effective use of other skills including time management, in academic settings and later in work activities (Richards, 1987).

Zentall et al. (1993) developed two scales for assessing student organization, specifically for children with ADHD. The Child Organization Scale (COS) is a self-report measure for children to determine a student's perception of his (a.) organization of inanimate objects and (b.) organization of time. Designed for concurrent use with the COS, the Child Organization Parent Perception Scale (COPPS) was developed to assess a student's organization of time and objects. Both scales indicated spatial and temporal organizational difficulties for students with ADHD (Zentall et al., 1993). Psychopathology also has been correlated with regulating the study environment (Brackney & Karabenick, 1995).

Gall et al. (1990) included organizational skills as part of teaching overall self-management skills to students. They include the goals of "filing and transporting classroom materials" (p. 62) and "organizing a home study space" (p. 62). Methods teachers might employ for teaching students these skills include requiring the use of a three-ring binder, providing lessons and games regarding organization of their desk at school, teaching students ways to define and organize a place to study at home, providing incentives for using appropriate skills, and eliciting parent support. Stormont-Spurgin (1997) also recommended the use of routines in the classroom and cooperation with parents. In addition, lists of daily materials could be provided to students. Teachers could use cooperative homework teams that might compare students who have good organizational skills with students who may lack effective use of such skills. Such teams would be reinforced for completing work in a timely manner. Positive reinforcement, even the use of contracts with specific goals for using good organizational skills in the

classroom, could be a helpful reminder for students to practice good habits. Finally, the use of assignment folders and daily planners would help students to keep papers organized and to see at a glance what materials are necessary to complete a task (i.e., geometry homework might require a pencil, protractor, calculator).

Time Management

Weissberg, Berentsen, Cote, Cravey, and Heath (1982) found that 62% of undergraduates at a university identified their greatest need to be managing their time more effectively. Therefore, it is not surprising that numerous books and learning strategies classes have included efficient time management skills as a focus. Most sources have offered very similar suggestions for improving these skills (Macan, Shahani, Dipboye, & Phillips, 1990). Effective time management, often included as a self-regulatory strategy, has been associated with higher course grades (Brackney & Karabenick, 1995; Zimmerman, Greenberg, & Weinstein, 1994).

Britton and Tesser (1991) presented time management from an information processing perspective. Given a limited amount of time and a set of tasks to be completed, it makes sense that a student who is able to efficiently allocate time to prioritized tasks would be able to accomplish more academically. Many different factors of tasks must be taken into account when prioritizing tasks, including task length, complexity, deadlines, and resources needed. As mentioned earlier, time management skills have also been described as a subset of organizational behaviors (Zentall et al., 1993)

Macan and colleagues (1990) developed a measure of time management called the Time Management Behavior Scale (TMB). Items on the scale were based on behaviors recommended by various sources on time management. Factor analyses indicated four separate factors. The first factor included behaviors consistent with setting goals and prioritizing tasks appropriately. The second factor involves the mechanics of planning and scheduling. The third factor is intended to measure a student's perception of control over how his or her time is spent. Finally, the fourth factor is a measure of organization in activities and materials.

Macan et al. (1990) also examined the correlation of time management behaviors measured by the TMB with numerous factors including role ambiguity, role overload, job tension, somatic tension, job and life satisfaction, and grade point average. Results indicated that students' report of effective general time management behaviors were significantly correlated with role ambiguity, somatic tension, job and life satisfaction, self-rated performance, and GPA. The third factor of the TMB, perceived control of time, was significantly correlated with all measures. Greater perceived control over time was associated with less role ambiguity, job induced tension and somatic tension; it was also associated with higher scores on life and job satisfaction measures as well as self-reports of achievement and grade point average (Macan et al. 1990). Correlations with the remaining three factors ranged from two (Factor 1 – Setting Goals & Priorities) to four (Factor 2 – Mechanics, Planning & Scheduling). Demographic variables revealed that older students yielded higher overall TMB scores, and females reported more time management behaviors than males. No differences were noted

according to race. With regard to intervention, students who have attended a time management seminar obtained higher TMB scores. No differences were found for those who had only read a book on time management.

Britton and Tesser (1991) also demonstrated promising effects of time management skills and attitudes for college students. Regression analyses of their time management questionnaire yielded three factors: short-range planning, time attitudes, and long-range planning. The first two factors were more predictive of subsequent academic grade point average than SAT scores.

Gall et al. (1990) discussed time management skills as part of overall self-management goals to be included when teaching study skills. Such skills include learning to organize a schedule, setting attainable goals and accurate timelines, deciding on priorities, arriving on time for class or other obligations, completing work on time, providing rewards or incentives for work completion, and breaking an assignment into manageable parts. Gall and his colleagues offer several suggestions for incorporating time management skills in the classroom. For example, teachers might have students use an assignment sheet to keep track of tasks to be completed in their various classes. Students should be taught specifically how to schedule their time and encouraged to monitor how well they stay on schedule. It would be helpful to show students ways to break larger tasks into smaller more manageable ones. Whenever possible, it is important to draw the connection between students' goals and their academic effort. Incentives are helpful in reinforcing the use of good skills. Finally, Gall et al. (1990) suggested involving parents by having them provide for and monitor study time, model

good time management behavior, provide tools such as “to do” lists and assignment planners, and reinforce good time management practices at home.

To aid specifically with time organization, or time management, Stormont-Spurgin (1997) recommended that teachers help students by providing structure and routines at school. Simple activities such as having students estimate the time it will take to complete an assignment and giving them feedback about their predictions can help to improve future estimates or having students make “to do” lists can increase good time management skills. Teachers might also help by having students break down and analyze different parts of large assignments in order to more accuracy assess the amount of time they will require. Finally, students should be encouraged to make lists of assignments and their due dates at the end of each school day, keeping in mind future projects that will be due (Stormont-Spurgin, 1997).

Academic Motivation

As asserted earlier, Weinstein et al.’s (2000) model of strategic learning includes three components: skill, will, and self-regulation. “Will” encompasses the motivation to learn. To overlook this factor when looking at success or failure in the classroom would be short-sighted. Yet, some researchers and teachers of learning strategies ignore the crucial role that motivation plays in terms of students’ learning, in general, and the selection and use of learning strategies, specifically. Among other things, motivation determines investment in the process of learning, which strategies are used, and the amount of effort put into carrying them out. In addition, understanding motivation helps

to explain the differential use of learning strategies, both between students and in one student across learning situations.

Dembo and Eaton (1996) point out that the definition of motivation differs according to one's theoretical orientation. It might be described according to the frequency, duration, and/or intensity of behavior (behaviorist), as an unconscious drive (psychodynamic), or as a student's thoughts or feelings about a task (cognitive). It might also take into consideration the students social or cultural experiences (Dembo & Eaton, 1996). In general, motivation can be seen as the "process by which the individuals' needs and desires are activated and, thus, directs their thoughts and their behaviors" (Alexander & Murphy, 1998, p. 33). Dembo & Eaton (1996) define motivation as "an internal state that arouses, directs, and maintains behavior" (p. 68). They discuss internal factors of motivation in terms of three components: (a) expectancy, or the student's attributions and self-efficacy for success/failure, (b) value, or the importance placed on the task, and (c) affective, or the emotional processes associated with the learning situation. Self-motivational beliefs are also included as part of a cyclical model of self-regulation (Zimmerman, 2002). Such beliefs are important in the forethought phase of learning and include self-efficacy, outcome expectations, intrinsic interest or value, and goal orientation. Academic achievement motivation is a construct of motivation that relates specifically to academic learning. Theories of achievement motivation abound, including self-efficacy, attribution, and goal theories as well as self-determination and intrinsic motivation. Many have argued that much can be learned from integrating the practical points of these theories when the aim is for successful interventions in the

classroom (Brophy, 2004; Roeser & Galloway, 2002). Others feel that there is merit in viewing academic motivation as a multidimensional construct (Bong, 2001). Brophy (2004) asserted that self-efficacy, attribution, and goal theories can all be conceptualized in the expectancy part of expectancy-value theory.

Expectancy-value theory suggests that "individuals' expectancies for success and the value they have for succeeding are important determinants of their motivation to perform different achievement tasks, and their choices which tasks to pursue" (Wigfield & Tonks, 2002, p. 54). A student's expectancy for success may depend largely on his or her self-efficacy for the task. Self efficacy is defined as "People's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Put simply, self-efficacy refers to a person's confidence in their ability to complete a task. It is generally considered to be situation-specific, Self-efficacy is the product of perceived performance in previous tasks and perceived control that a person feels he has had, and it affects a child's choice of tasks, persistence, future performance, and his or her emotional reaction to the task or situation. Self-efficacy regarding a given task and self-concept are generally unrelated (Hofer, Yu, & Pintrich, 1998). In addition, self-efficacy is independent of ability (Collins, 1982). Self-efficacy has been associated with improved coping with stress and academic performance (Chemers, Hu, & Garcia, 2001).

One might think that we must only be concerned with children who have low self-efficacy. However, having unrealistically high expectations regarding performance can be detrimental to academic performance just as low expectations can. Dweck and

Leggett (1988) found that college students reported having unrealistic expectations about their ability when they started college.

Learning strategies interventions can have a direct effect on self-efficacy (Corno & Mandinach, 1983). Being able to use a strategy to accomplish a task provides a sense of control over performance outcomes. If the strategy is successful, then the students' self-efficacy is improved and the learner is more likely to use the strategy again. In several studies, efficacy has been positively correlated with the use of learning strategies (Pintrich & De Groot, 1990; Zimmerman & Martinez-Pons, 1990). Even vicarious experience through modeled use of strategies improved efficacy and motivation (Schunk & Gunn, 1985).

Attribution theory refers to a person's natural desire to understand why things happen and their beliefs about the causes of success or failure (Dembo & Eaton, 1996). Therefore, with regard to learning, attribution theory refers to a student's perceptions of the causes of academic success or failure. Wiener's (1979, 1986) achievement motivation theory is the most commonly accepted theory of attribution. Her model provides for classification of attributions in three dimensions: internal/external, stable/unstable, controllable/uncontrollable. Subsequent beliefs and future actions depend on the student's judgment of events in these dimensions. When students fail, they must decide whether the outcome is due to lack of ability or lack of effort. For example, children with learning disabilities often display learned helplessness in their approach to strategy use and learning (Miranda, Villaescusa, & Vidal-Abarca, 1997). They attributed failures in a learning context to a lack of ability on their part (internal

cause). They attributed a pattern of failure that is unchanging over time to a lack of ability (stable). Finally, their attribution is that a lack of success is due to low ability and belief that outcomes cannot be changed by effort on their part (uncontrollable). As a result, children with learning disabilities and other children having difficulty academically are less likely to have confidence in the effectiveness of learning strategies. When making attributions regarding outcome, children examine several factors (Frieze, 1976). These include the current outcome, their history with the same or a similar task, and how others performed on the same task. The attributions they make will affect their expectancy of future performance, persistence in similar tasks, emotional responses, which tasks they choose, and students' self-efficacy (Dembo & Eaton, 1996; Weiner, 1976). Palmer and Goetz (1988) argued that, in addition to these affects, attributions also affect when and how strategies are utilized.

With such vast consequences regarding a student's attributions, it makes intuitive sense that interventions for children having academic difficulty (i.e., study strategies courses or curricula) should also target children's attributions. Mixed results have been obtained with research examining the incorporation of attribution retraining with learning strategies instruction. Retraining improved use of reading strategies in a group of children with learning disabilities (Borkowski, Weyhing, & Carr, 1988). Similarly, attribution-based intervention with a group of college freshmen produced an 18 percent higher rate of passing final exams (Van Overwalle & De Metsenaere, 1990). However, attribution retraining was only partially supported (Craske, 1985) or not supported by similar studies (Miranda, Villaescusa, & Vidal-Abarca, 1997; Short & Ryan, 1988).

Miranda et al. (1997) suggested that the self-regulation procedures included in their training may have fostered sufficient self-confidence, circumventing the need for additional training with a group of children with learning disabilities.

It has been argued that perhaps goal theory can provide the best conceptualization of student motivation (Brophy, 2004). Traditionally, goal theory suggested that students adopt one of two distinct goals—performance or mastery. Performance goals, also known as task or ability goals, include a view of learning as a means to an end. These goals focus on "one's ability and sense of self-worth" pairing evaluation of one's ability with the process of learning (Ames, 1992, p. 262). Mastery goals, also known as learning or task goals, are those in which "individuals are oriented toward developing new skills, trying to understand their work, improving their level of competence, or achieving a sense of mastery based on self-referenced standards" (Ames, 1992, p. 262). Church, Elliot, and Gable (2001) found that adoption of mastery goals was associated with perceived lecture engagement and a lack of harsh or evaluative environment. The latter were associated with adoption of performance goals. The classroom environment helped to determine which goal orientation was adopted, which in turn affected students' grades.

Ames has conceptualized performance and mastery goals as contrasting goals that do not coexist (Ames, 1992). Some subsequent studies have suggested that this is a simplistic view. More recently a 2x2 model has been suggested that takes into account approach/avoidance goals as well as mastery/performance (Kaplan & Maehr, 2002). Brophy (2004) pointed out that learning or mastery approach goals appear to facilitate

achievement while performance avoidance goals hinder achievement. The role of performance approach goals is less clear. Some argue that they may be helpful, while other suggest that they are a hindrance. Still others suggest that their usefulness or detrimental nature may be related to situational factors including the age of the students (Pintrich, 2000). Research on mastery avoidance goals is lacking (Kaplan & Maehr, 2002). What little research exists suggests that mastery avoidance goals may be associated with disorganized learning and test anxiety (Elliot & McGregor, 2001). Many studies suggest that these goals are not adopted in isolation (Kaplan & Maehr, 2002). Students may adopt multiple goals depending on the situation. While the 2x2 conceptualization of goal theory is compelling, it should be noted that it fails to take into account other goals that students have endorsed, such as work completion and social goals. Recently, Kaplan and Maehr (2002) have presented a model that takes into account personal and situational characteristics when determining goal orientation. Three major components comprise what they term a "personal achievement goal": perceived purpose in the situation, self-processes (i.e., self-efficacy, social identity), and the available possibilities for action in the situation.

Somewhat similar to a mastery orientation is academic intrinsic motivation. Gottfried, Fleming, and Gottfried (2001) describe academic intrinsic motivation as concerning "enjoyment of school learning characterized by a mastery orientation; curiosity; persistence; task endogeny; and the learning of challenging, difficult, and novel tasks" (p. 4). Findings of their longitudinal study suggest that academic intrinsic motivation increases in stability over time; however, intrinsic academic motivation

decreases with age in general, and its effects are dependent on the academic subject. Gottfried et al. (2001) point out several factors that may contribute to this decline, including increased extrinsic consequences for failure, increasing anxiety in school, and changing parental demands.

While an ultimate goal for teachers might be intrinsic motivation, a more realistic conceptualization of fostering academic motivation would "include encouraging (students) to use thoughtful information-processing and skill-building strategies when they are learning. This is quite different from merely offering them incentives for good performance later." (Brophy, 2004, p. 15).

Elliot and Sheldon (1997) identified four levels of goal representation in the literature: task specific, situation specific, personal goals, and self-standards/images of self in the future. While many studies have examined these levels with respect to approach goals, few have focused on avoidance achievement goals. This study, conducted with college students over the course of a semester, suggested that avoidance achievement goals were associated not only with lower achievement pursuits, but also decreased their self-esteem, personal control, vitality, and life satisfaction, . . ." (Elliot & Sheldon, 1997, p. 180).

Self-determination theory (SDT) has been used extensively in academic motivation research. Developed by Deci and Ryan (1985), this theory proposes that humans have an innate desire to learn. This desire may be encouraged or discouraged by a person's environment. Fulfillment of three basic psychological needs—competency, relatedness, and autonomy—is necessary in order for intrinsic motivation to develop

(Deci & Ryan, 1985, 2000). In addition to intrinsic and extrinsic motivation, SDT also proposes the existence of amotivation or the absence of any desire to pursue an activity. Rather than a simple dichotomy, these three states exist on a continuum, with varying degrees of extrinsic motivation: external regulation, introjected regulation, identified regulation, and integrated regulation. Vallerand, Pelletier, Blais, & Brière (1992) have further divided intrinsic motivation into three categories: intrinsic motivation to know, intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation. The Academic Motivation Scale (AMS, Vallerand et al., 1992) was developed as a measure of academic motivation based on SDT. Somewhat like mastery versus performance goals, some researchers have argued that validity studies of the AMS suggest that the constructs of SDT may not fit well along a continuum. Rather, they might be better conceptualized in a hierarchical manner (Fairchild, Horst, Finney, & Barron, 2005). Nevertheless, the AMS continues to be used as a research tool for studying academic motivation.

Strategies for improving academic motivation are numerous and often vary according to the theoretical orientation adopted. Individual strategies used to facilitate academic motivation include self-talk, goal setting, and time management (Dembo & Eaton, 1996). Classroom management strategies can also have a profound effect on students' academic achievement motivation (Brophy, 2004; Church et al., 2001). The reader is referred to Brophy (2004) for an integrated review of theories of academic achievement motivation with a strong emphasis on how teachers can use aspects of each

of these theories to adapt their teaching style and classroom environments to maximize student effort.

Test Anxiety

The effect of test anxiety on performance during evaluations has been documented (Hembree, 1988). Research regarding stress or anxiety during evaluative situations dates back almost a century. Spielberger and Vagg (1995) point to a finding in the 1914 Journal of Biological Chemistry that 1in 5 medical students evidenced glycosuria following an examination indicating physiological stress. Hembree (1988) credited the beginning of the modern assessment of test anxiety to Sarason and Mandler (1952) at Yale University, who used a self-report instrument called the Test Anxiety Questionnaire. Numerous theoretical perspectives in research have resulted in the development of several different models.

Spielberger conceptualized the relationship between anxiety and evaluation as a temporal event. For a test anxious student, a stressor (test) is perceived as a threat resulting in a state of anxiety (Stressor →Threat →State Anxiety). Given that this state anxiety occurs consistently during evaluations, test anxiety is considered to be a situation-specific trait (Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978). Hong and Karstensson (2002) further contended that it is a situation-specific trait that can be specific to one type of test. Liebert and Morris (1967) described test anxiety in terms of two components: worry and emotionality. While emotionality is concerned with physiological manifestations of anxiety or arousal, worry is a student's cognitive thoughts about failure during the task. Wine (1971) supported Liebert and Morris's later

assertions that the worry component of anxiety is more detrimental to academic performance than the emotionality component. However, Spielberger and Vagg (1995) asserted that it is likely the experience of emotionality that triggers worry in an individual. Sarason (1986) further defined Liebert and Morris's (1967) worry-emotionality conceptualization to include four categories: tension, worry, task-irrelevant thoughts, and bodily reactions.

Four main theories have evolved in the study of test anxiety: the cognitive-attentional model, the learning deficit model, the dual deficit model, and the social learning model (Jones & Petruzzi, 1995). More recently integrative models have been proposed that incorporate previous theories (Jones & Petruzzi, 1995, Spielberger & Vagg, 1995). The cognitive-attentional model, the first model to emerge, encompasses the worry-emotionality constructs, asserting that excessive worries, self-coping statements, concern regarding physiological reactions, and other task-irrelevant thoughts interfere with optimal task performance (Naveh-Benjamin, 1991; Wine, 1971). Second, the learning deficit model proposed that test anxiety arises from a lack of adequate study and test-taking skills (Hodapp & Henneberger, 1983). While the relationship between poor study habits and test anxiety has been supported, Tobias (1985) has pointed out that the model does not explain how high-achieving students who have good study skills can also experience test anxiety. The dual deficit or information processing model seeks to bridge the gap between the cognitive-attentional model and the learning deficit model, indicating that both task-irrelevant thoughts and skills deficits can contribute to feelings of anxiety (Jones & Petruzzi, 1995). As the term information processing suggests, test

anxiety appears to be caused by difficulties encoding and organizing material as well as retrieval during an evaluation (Naveh-Benjamin, 1991). Finally, the social learning model suggests that the etiology of test anxiety lies with a student's self-efficacy regarding a task and motivation to perform well.

Several integrative models have also emerged. Spielberger and Vagg's (1995) Transactional Process Model describes the relationships among antecedents, student dispositions, cognitive processes, and the consequences associated with test anxiety Spielberger & Vagg, 1995). Antecedents considered are the subject matter of the test, study skills, and test taking skills. During the evaluation, a student retrieves and processes information, continually appraises his situation, and may respond with an increase in worry and/or emotionality. The result of these processes will either be behavior that is relevant to the task or not relevant to the task.

The complexity of factors which may cause or exacerbate test anxiety in children is overwhelming. Individual factors, parent influence, teacher or classroom factors, and characteristics of the tests themselves have all been considered as possible culprits. Like learning strategies, most studies have examined test anxiety in college students. Some studies do exist, however, that specifically target children in elementary and secondary settings.

Newbegin and Owens (1996) examined the relationship between test anxiety, self-esteem, and academic achievement in English and math. Their results were consistent with Marsh (1990) in that measures of esteem were negatively correlated with

high anxiety. Esteem was positively correlated with academic achievement. A limitation of this study was their use of only male subjects in private schools.

Beidel, Turner, and Trager (1994) also found evidence that children who are test anxious are more likely to meet criteria for anxiety disorders. Children who were highly test anxious demonstrated higher pulse rates, higher blood pressure, and more clinical symptoms on behavioral reports. Differences in race were obtained on pulse rates and blood pressure. African American children who were test anxious were more likely than Caucasian children to meet DSM IIIR criteria for social phobia.

King, Mietz, Tinney, and Ollendick (1995) extended the research regarding a relationship between test anxiety and other psychological disorders by comparing high test anxious and low test-anxious students on several self-report measures and clinical interview. Their results suggest a significantly higher report of clinical symptoms and emotional distress in students measuring high on a test anxiety scale. Disorders were typically within the Anxiety Disorders realm, but higher scores were also obtained on the Children's Depression Inventory (CDI) than with the control group.

Wigfield and Eccles (1989) pointed out that anxiety may be experienced differently for high achieving students than for low achieving students. High achieving students may be anxious due to unrealistic expectations placed on them by parents, peers, or self. Less able students may be anxious due to previous experiences of and future expectations of failure. Further, Naveh-Benjamin McKeachie, and Lin (1987) suggested that some anxious students may have good study habits but suffer from the pressure of being evaluated, whereas other students have poor study strategies which

inhibit their learning. The significance of these differences is that changing test conditions may help students with fears of evaluation, however, those whose learning process has been impaired would not benefit from such changes.

It appears that test anxiety peaks during junior high school. Wigfeld and Eccles (1989) discussed the reasons that anxiety would increase during this time. Less has been postulated regarding the reason for a decrease in test anxiety following junior high school. One suggestion might be that, as students become more aware of their own ability, anxiety increases but coping skills have not yet developed. Such coping skills, including the development of effective learning strategies, time management, and organizational skills, may serve to increase students' feelings of control, increasing motivation and decreasing feelings of anxiety regarding evaluations.

Plass and Hill (1986) identified four basic responses by test-anxious students in the literature: (1.) refusal to complete the task, (2.) slow progress and off-task behavior, (3.) slow but accurate work (which may be detrimental on timed tasks), and (4.) fast but inaccurate work (presumably due to an expectancy of failure. In their study, time pressure resulted in poorer performance for high and moderately anxious fourth graders of both sexes. Boys' performance was optimal with the removal of time constraints. Removing time constraints was not enough to optimize girls' performance. The gender difference was unexpected given previous research.

Research has suggested that a student with high anxiety divides his/her attention between task-relevant and task-irrelevant thoughts (Wine 1971). Irrelevant thoughts reported by adults in Galassi, Frierson, and Sharer (1981) might include comparing

oneself to others, poor concentration, and a desire to escape the testing situation. It is interesting to note, however, that in that study, highly anxious adults reported more on-task thoughts than their less anxious peers.

Zatz and Chassin (1985) also suggested that the effects of the person and the environment may have an effect on anxiety and its resulting effect on task performance. They replicated findings obtained in Zatz and Chassin (1983) with children and Galassi et al. (1981) with adults, suggesting that highly anxious children are similar to anxious adults in their increased reporting of negative self-evaluations. Further, their findings did not support their hypothesis that coping statements made by test anxious children improved their performance. Their findings also suggested that it is the absence of negative thoughts rather than the presence of positive thoughts that improves performance. This finding has significant implications for programs designed to decrease anxiety and improve performance in testing situations. With regard to perceived threat of a testing environment, students with moderate test anxiety were hindered in their performance in low-threat environments, while the scores of students with high test anxiety were significantly affected by a high-threat environment.

Prins, Groot, and Hanewald (1994) replicated Zatz and Chassin's study with fifth and sixth graders in the Netherlands. Their results were supportive. Also, findings were similar in that students with high test anxiety reported more self-coping statements than low test-anxious students, likely because they perceived the situation as stressful. This is an ineffective coping technique, however, given the detrimental effect of the off-task and

negative thoughts. They, too, advocated focusing on decreasing negative and off-task cognitions in intervention programs.

Hembree (1988) conducted a meta-analysis of 562 reports of research examining the causes, correlates, and effects of test anxiety. His main conclusions regarding relationships of test anxiety to other variables included the following: (a) an inverse relationship between test anxiety and achievement exists from third grade onward, (b) worry tends to be more associated with achievement than emotionality, (c) no gender differences exist regarding the relationship between anxiety and achievement, (d) females report higher levels of anxiety, but with no corresponding achievement differences, (e) test anxiety increases significantly in later elementary years, (f) some racial differences exist relative to age, and (g) lower test anxiety is associated with higher ability in general.

A complicating factor to consider in the measurement of test anxiety is that anxiety as it relates to performance is likely not linear. Several theories of the nature of test anxiety have been proposed in the literature during the course of test anxiety research. Ball (1995) summarized the following suggestions regarding the relationship between test performance and test anxiety: (a) “that test anxiety may be facilitating” (for some students), (b) that moderator variables including test difficulty and “the proficiency of the test taker” may be present, and (c) “the relation between test anxiety and performance may be curvilinear” (p. 109).In addition to the isolated detrimental effects of test anxiety, researchers have also been interested in the relationship between test anxiety and the use of learning strategies. Many times, students who are test anxious

demonstrate poor study habits and organizational difficulties which inhibit information processing (Culler & Holahan, 1980; Naveh-Benjamin et al., 1987).

Self-report methods are most commonly used to assess test anxiety, likely due, in part, to their efficiency and ease of administration. Such measures appear to be used primarily for research purposes rather than for diagnostic or intervention purposes. The most commonly used measures are the Test Anxiety Scale for Children (TASC; Sarason, Davidson, Lighthall, & Waite, 1958) and the Test Anxiety Inventory (TAI; Spielberger, 1980). Psychophysiological assessment has also been attempted. The reader is referred to Beidel (1991) for a review of these studies. In addition, Beidel (1991) also detected differences on measures of blood pressure and pulse rates in students with test anxiety.

Interventions. Given the effects that test anxiety has on task performance, it is not surprising that many people have been interested in determining what interventions might be most effective in alleviating anxious feelings. So what is considered to be the most effective method of achieving this goal? A cursory glance at the literature might leave one with the impression that W. J. McKeachie was left with early in his studies of test anxiety: “anxious students are made anxious by almost anything one does to try to help them” (McKeachie, 1984, p. 193). As with studies regarding the antecedents and correlates of test anxiety, there is a lack of good research investigating the effectiveness of intervention with children and adolescents who experience test anxiety (Ergene, 2003). Wilson and Rotter (1986) cited several studies that have suggested the superiority of combining study skills training and treatment for test anxiety in improving academic performance and decreasing anxiety. In their own study, they used sixth and seventh

graders with high scores on the Test Anxiety Scale for Children to compare several different treatment methods. Treatment groups included: anxiety management training, study skills counseling, modified anxiety management training, and an attention-placebo treatment. The modified anxiety management training group received anxiety management training combined with "suggestions for strengthening the ego and developing memory and concentration, with a focus on study habits" (Wilson & Rotter, 1986, p.22). While all treatment groups demonstrated reduced test anxiety and to some extent increased self-esteem and better test performance, the modified anxiety management training produced the greatest effects in all three areas. These effects were significant even at a two-month follow-up.

Annis (1986) used the Achievement Anxiety Test (AAT) developed by Alpert and Haber (1960) to study the effectiveness of a study skills course in alleviating "debilitating anxiety", while increasing "facilitating anxiety" in a college sample. For both groups, but particularly for women, the study skills course decreased "debilitating anxiety" while increasing "facilitating anxiety".

A multi-component approach was also supported by Decker (1987). Decker used stress management training comprised of cognitive restructuring, relaxation, time management, attention control, test-taking, and study-skills training with college freshmen. While increases in scores were not evident with the Survey of Study Habits and Attitudes (SSHA), significant decreases were noted on a measure of test anxiety, and grade point average improved significantly as well.

Dendato and Diener (1986) determined that a program combining study skills, cognitive therapy, and relaxation training was effective in decreasing anxiety and increasing academic performance. Study skills training alone was not enough to decrease test anxiety or increase task performance. Cognitive therapy and relaxation training were helpful in alleviating anxiety but had no effect on task performance.

Cavallaro and Meyers (1986) identified three main approaches for alleviating test anxiety and thereby improving academic performance: (a) rational-emotive therapy and cognitive restructuring, (b) desensitization, relaxation, and self-control techniques, and (c) training in study or test-taking skills. They were particularly interested in how interventions are more or less effective based on individual differences. In their study of adolescent females, the treatment group receiving relaxation and cognitive restructuring was significantly more effective than the treatment group receiving relaxation and study skills training or control for students who already possessed good study habits. In fact, the cognitive restructuring and relaxation intervention was the more effective intervention overall. As expected, for students with good study habits, the relaxation and study skills intervention was not significantly effective. For students with poor study strategies, this intervention was somewhat effective. It should be noted, however, that several possible reasons for the differential effects of the treatment groups, including the overly didactic nature of the study skills training, possible differences in length of time needed to learn, and discrepancies in group sizes were suggested.

Glanz (1994) investigated how to reduce test anxiety for male fifth grade students with learning disabilities. While teaching the experimental group relaxation

strategies resulted in reduced self-reports of test anxiety and significantly lower reports than a control group, unfortunately, no assessment was made regarding the effectiveness of the treatment in increasing scores in testing. Rather, the intention of the study was to look at the differential effects of treatment on more specific populations of students.

With regard to intervention, Hembree's (1988) meta-analysis asserted that a variety of cognitive and behavioral interventions have had lasting effects in reducing anxiety and increasing academic performance. The discovery that interventions overall improve test anxiety was inconsistent with previous reviews. Hembree attributed the failure to find such effects to generally low sample sizes which would not detect modest effects. Test-taking strategies training was also helpful for students who have poor skills.

Attention/concentration

Attention is a fundamental component of learning (e. g., see Riccio, Reynolds, Lowe, & Moore, 2002), so it is fundamental to success on any academic task. Most theories of learning include as their first step, the ability to attend adequately to the material to be learned. Attention is a precursor to memory and learning—a student must attend before learning can occur (e. g., see Reynolds & Voress, in press). Students must attend to lectures and other academic tasks, adjust levels of attention as tasks may require them, self-monitor attention to academic tasks, and be able to avoid distractions.

Inattention in school children is often attributed only to children with ADHD. Indeed, prevalence rates ranging from 3% (American Psychiatric Association, 1994) to 10-20% of school-age children (Shaywitz & Shaywitz, 1992), certainly suggest this is a common problem in most classrooms. However, attention problems plague many

children suffering from other psychological disorders. The relationships between both internalizing and externalizing disorders and academic underachievement appear to be mediated by attention (Barriga, et al., 2002; Hinshaw, 1992). Given these effects, it is imperative to include assessment of attention with children who are struggling academically (Barriga et al., 2002). Many times, problems attending are eclipsed by more overt and disruptive behavioral symptoms, such as hyperactivity or defiance or by the severity of internalizing symptoms. Given the significant effects of attention on achievement, however, it should clearly be targeted for intervention.

The ability to self-monitor and adjust in a learning environment is also seen by cognitive psychologists as an important skill in the development of effective learning strategies (e.g., Alexander & Murphy, 1999). Strategies are dependent upon the processes of identifying important information, allocating attention, and monitoring comprehension (Reynolds & Shirey, 1988). In turn, increasing a student's skills in study, note-taking, and test-taking strategies is likely to increase a student's perception that attention and performance can be controlled. Increasing a student's interest in subject matter also may be helpful. Without intervention, the effects can be significant, both on the use of learning strategies and emotional adjustment as well (Borden et. al., 1987).

Numerous classroom strategies appear to be helpful in engaging children with attention problems. These techniques target areas such as getting attention, focusing attention, sustaining attention, reducing distractions, teaching organizational skills, increasing time management skills, and increasing specific skills in content areas (Teeter, 1998).

Existing Measures

While several measures currently exist that purport to measure learning strategies and/or self-regulated learning, most have significant limitations in their utility. The 2 most commonly used assessment measures are the Learning and Study Strategies Inventory (LASSI, Weinstein, 1987) and the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich; Smith, Garcia & McKeachie, 1991). Unfortunately, the MSLQ was created for college students.

The LASSI also was originally designed for use with college students (Weinstein, 1987). The LASSI for high school students is a downward extension of a college level version of the same instrument. The LASSI has 10 scales: (1) attitude and interest, (2) motivation, diligence, self-discipline, and willingness to work hard, (3) use of time management principles for academic tasks, (4) anxiety and worry about school performance, (5) concentration and attention to academic tasks, (6) information processing, acquiring knowledge, and reasoning, (7) selecting main ideas and recognizing important information, (8) use of support techniques and materials, (9) self testing, reviewing, and preparing for classes, and (10) test strategies and preparing for tests.

The Need for a New Inventory

An inventory to assess learning strategies and study habits has several purposes. Weinstein, Zimmerman, and Palmer (1988) identified three historic purposes for such an inventory: “(1) prediction of academic performance, (2) counseling students concerning their study practices, and (3) screening or criterion measures for study skills courses” (p.

26). They proposed additional purposes for the development of the LASSI which included: assessment of a wide variety of topics related to and including learning strategies with sound reliability and validity, assessment of behaviors that could be changed, representing current research in cognitive psychology, and use as a diagnostic instrument (Weinstein et al., 1988).

The purposes of the School Motivation and Learning Strategies Inventory (SMALSI) include those identified by Weinstein et al. (1988) in addition to several others. First, little is known about special populations and their individual needs. Those mentioned previously include children with ADHD, cancer, learning disabilities, or children with Traumatic Brain Injuries. Second, and probably the greatest potential for contribution that the SMALSI will make is that it covers a wider range of child development. Measuring these constructs across ages will provide a greater understanding of the development of certain cognitive skills as well as an understanding of motivational factors and how they change from childhood to adolescence. This purpose has not been feasible with previous inventories. It has been argued that younger children may not be cognizant of their academic behaviors (e.g., learning strategies) and attitudes to provide meaningful information in the areas to be measured. Research in similar areas suggests that this is not the case. Rather, many studies have shown the ability of children as young as 5-years-old to report their perceptions, feelings, and behaviors (e.g., see Reynolds & Kamphaus, 1992, 2004; Reynolds & Richmond, 1983). It is hypothesized that results of the current project will lend further support to this contention.

The SMALSI was intended to help to identify which behaviors are consistent with academic success and how or if these behaviors vary according to age, gender, intelligence, motivation, attributions, and other relevant variables. Existing inventories have provided a reasonable understanding of learning strategies from a remedial perspective. In other words, they identify strategies that a student should have developed or used earlier in their schooling to aid in their academic success. In many circumstances, these are skills which should have been used with increasing proficiency since the earliest elementary grades. Weinstein et al. (2000) has called for research to help understand the development of learning strategies in younger children. This is not possible without an established means of measuring such strategies and their associated features.

It was the purpose of this project to develop an assessment of learning strategies and academic motivation for students in later elementary grades through high school. Such an instrument would have wide-ranging uses. Its most fundamental use would be to allow psychologists and educators to pinpoint skills that a student lacks and also the motivational or anxiety-producing factors that may play a role in learning or performance. Interest in cognitive strategies has, for many years, focused on college-age students, and assessment has centered on detecting weaknesses for remediation.

It has been argued that learning strategies naturally increase as a student matures, regardless of instruction. While true for many strategies, this is not the case for all learning strategies. Reading comprehension strategies such as making up questions while reviewing texts or making visual representations of information do not improve over

time (Thomas & Rowher, 1986). Self-regulated learning strategies appear to change as students progress, some increasing while others increase then decrease over time (Zimmerman & Pons, 1990). Furthermore, the changing frequency of use of some strategies appears to be dependent on how often other strategies are used. For example, Zimmerman and Pons (1990) found that students reported a decline in the practice of reviewing textbooks from junior high to high school and an increase in reviewing notes. These two trends suggest a shift in use of strategies based on the nature of their changing learning activities.

CHAPTER III

METHODOLOGY

It was the goal of this project to develop a self-report inventory for children and adolescents to assess learning strategies and other constructs empirically associated with academic success. This chapter will present the procedures used in the development and standardization of the School Motivation and Learning Strategies Inventory (SMALSI). First, subject demographics will be presented separately for the pilot stage, standardization stage, and validity studies. Next, the subject recruitment is discussed followed by a description of study measures. Finally the data analyses for the evaluation of the reliability and validity of the SMALSI will be presented.

Participants

Pilot Stage

Subjects were 347 children ages 8 to 12 (mean 10.9, *SD* = 1.4) and 245 adolescents ages 13 to 18 (mean 13.8, *SD = 2.0*). Of the child sample, 52% were male (*N* =180), 28% (*N* = 95) were African American, 41% (*N* = 143) were Caucasian, 26% (*N* = 56) were Hispanic, and 1% (*N* = 4) were American Indian. Twelve percent (*N* = 41) of the children were in the 3rd grade, 24% (*N* = 82) in the 4th grade, 23% (*N* = 80) in the 5th grade, 29% (*N* = 102) in the 6th grade, and 12% (*N* =41) were in the 7th grade. Of the adolescent sample, 51% (*N* = 126) were male, 17% (*N* = 41) were African American, 47% (*N* = 114) were Caucasian, 29% (*N* = 71) were Hispanic, and 2% (*N* = 4) were American Indian. Twelve percent (*N* =30) of the children were in the 5th grade, 3% (*N* = 7) in the 6th grade, 21% (*N* = 51) in the 7th grade, 33% (*N* = 81) in the 8th grade, 6% (*N* =

15) in the 9th grade, 6% (*N* = 15) in the 10th grade, 6% (*N* = 15) in the 11th grade, and 11% (*N* = 26) were in the 12th grade. Subjects were recruited from seven school districts in southeastern and north central Texas and Pennsylvania. Classes were general education classes. Though mainstreamed special education students were not targeted, they were not excluded from the study.

Standardization Stage

A total of 2921 students participated in the standardization stage for the SMALSI. Subjects were 1821 children ages 8 to 12 (mean 10, *SD* =1.1) and 1100 adolescents ages 13 to 18 (mean 15.4, *SD* =1.5). Subjects were recruited from schools throughout the United States. Public schools were the primary setting for data collection. Demographic characteristics of the participants, including gender, ethnicity, and parents' educational level, were generally consistent with United States Census frequencies (U.S. Bureau of Census, 2000). Detailed demographics of the standardization sample are provided in Table 1 (Child) and Table 2 (Teen).

Table 1
Demographic Characteristics of SMALSI Child Standardization Sample

Gender	*n*	Sample %
Male	894	49
Female	916	51
Missing	11	
Age		
8	151	8
9	426	23
10	519	29
11	454	25
12	271	15
Grade		
3	390	21
4	502	28
5	558	31
6	262	14
7	109	6
Ethnicity		
African American	529	29
American Indian/ Alaska Native	90	5
Asian	47	3
Hispanic	151	8
White	878	48
Other	83	5
Missing	43	2
Geographic Region		
Northeast	323	13
Midwest	325	19
South	892	52
West	276	16
Head of household's educational level		
Did not graduate from high school	331	18
High school graduate	485	27
Some college	469	26
College graduate	272	15
Graduate school	157	9
Missing	107	5

Note. N = 1821.

Table 2
Demographic Characteristics of SMALSI Adolescent Standardization Sample

Demographic	*n*	Sample %
Gender		
Male	488	45
Female	598	54
Missing	14	<1
Age		
13	140	13
14	199	18
15	203	18
16	249	23
17	199	18
18	110	10
Grade		
7	114	10
8	125	11
9	183	17
10	273	26
11	166	15
12	229	21
Ethnicity		
African American	85	26
American Indian/ Alaska Native	83	8
Asian	22	2
Hispanic	71	15
White	50	41
Other	47	4
Missing	42	4
Geographic Region		
Northeast	301	27
Midwest	138	13
South	390	35
West	271	25

Table 2 Cont'd

Demographic	*n*	Sample %
Head of household's educational level		
Did not graduate from high school	204	18
High school graduate	305	28
Some college	314	28
College graduate	183	17
Graduate school	94	9

Note. N = 1100.

Validation Stage

Of the total sample of children completing the SMALSI Child Form, 23 were identified to complete the Behavior Assessment System for Children—Self Report Profile (BASC-SRP) at the time of completing the School Motivation and Learning Strategies Inventory (SMALSI). In the child sample, 48% were male (*n* = 11). Thirty-nine percent (*n* = 9) were identified as Caucasian, 35% as Hispanic (*n* = 8), 9% as Asian (*n* = 2), 4% as African American (*n* = 1), and 13% as Other (*n* = 3). Thirty-five percent (*n* = 8) of the children were in the 3rd grade, 22% (*n* = 5) in the 4th grade, 39% (*n* = 9) in the 5th grade, and 4% (*n* = 1) in the 6th grade. Of the adolescent sample, 24 completed the BASC-SRP in conjunction with the SMALSI Teen Form. Twenty-nine percent were male (*n* = 7). Thirty-eight percent (*n* = 9) were identified as Caucasian, 33% as Hispanic (*n* = 8), 17% as Asian (*n* = 4), and 13% as Other (*n* = 3). Four percent (*n* = 1) of the adolescents were in the 7th grade, 17% (*n* = 4) in the 8th grade, 29% (*n* = 7) in the 9th

grade, 8% (*n* = 2) in the 10th grade, 17% (*n* = 4) in the 11th grade, and 25% (*n* = 6) in the 12th grade.

In addition, scores for the Texas Assessment of Knowledge and Skills test were obtained for 32 children. In this sample, 53% were male (*n* = 17). Thirty-eight percent (*n* = 12) were identified as Caucasian, 38% as Hispanic (*n* = 12), 19% as African American (*n* = 6), and 6% as Other (*n* = 2). Twenty-five percent (*n* = 8) of the children were in the 3rd grade, 25% (*n* = 8) in the 4th grade, 34% (*n* = 11) in the 5th grade, and 16% (*n* = 5) in the 6th grade. Of the adolescent sample, scores for the TAKS were obtained for 53 adolescents completing the SMALSI Teen Form. Forty percent were male (*n* = 21). Fifty-one percent (*n* = 27) were identified as Caucasian, 36% as Hispanic (*n* = 19), 11% as African American (*n* = 6), and 2% as Other (*n* = 1). Fifteen percent (*n* = 8) of the adolescents were in the 7th grade, 19% (*n* = 10) in the 8th grade, 28% (*n* = 15) in the 9th grade, 13% (*n* = 7) in the 10th grade, 19% (*n* = 10) in the 11th grade, and 6% (*n* = 3) in the 12th grade.

Procedure

Subject Recruitment

Pilot stage. The pilot sample was recruited by gaining permission from several school districts in southeastern and north central Texas and Pennsylvania. Permission was obtained through school districts and individual school principals for participation. Individual classes within the districts were randomly selected by school principals to participate. At least two classes per grade level from 3rd to 12th grade were recruited. Letters and informed consent forms were sent home to parents of children and

adolescents in the identified classrooms. Following obtainment of consent and child/adolescent assent (Appendix A), measures were administered by the child/adolescent's classroom teachers during a non-instruction time period during the regular school day. In classrooms in which the BASC-SRP was also completed, the teachers were instructed to give the additional form to every fourth student. Children and adolescents were supplied with envelopes in which to seal the BASC and SMALSI prior to returning to the researcher to maintain participant responses confidentiality. Envelopes were then turned in to the teacher. The sealed envelopes were returned to the researcher by the classroom teachers.

Standardization stage. The standardization sample was recruited throughout the United States in conjunction with Western Psychological Services (WPS). Subject recruitment for the standardization sample was conducted in four regions of the United States: Northeast, Midwest, South, and West. Duplicate procedures were conducted to identify and recruit subjects as was done in the pilot study. Since the SMALSI was administered in a group format to classes, some protocols were completed by students outside the determined age range of the form. These protocols were excluded from the analyses.

Administration

Teachers passed out SMALSI (SMALSI and answer sheet) and BASC forms to subjects. In the pilot study, students also completed a short demographic survey. In the standardization phase, the demographics were obtained on SMALSI answer forms. Teachers instructed subjects to complete all items on the form. Subjects were informed

that measures with incomplete items may not be scored due to decreased accuracy of the results. Subjects then read the instructions supplied on the front of the SMALSI. Teachers answered any questions that the subjects had prior to filling out the measures and as needed during the administration. When the subjects indicated that they were finished, teachers checked over the forms to confirm accurate completion. Subjects were asked to complete any items left blank, or to correct items that had been double-marked. Completed measures were collected by the teachers and returned to the researchers in envelopes provided by the researcher. The researcher entered the subjects' responses into the scoring program at a later time.

Measures

School Motivation and Learning Strategies Inventory (SMALSI; Stroud & Reynolds, 2006)

Scales were selected for the SMALSI following an extensive search of educational and psychological literature and existing measures as well as curricula for study skills courses. Constructs were chosen because they had been empirically supported for improving academic performance. Once selection of constructs was complete, a pool of items was generated for each construct. Items for each scale were then reviewed by researchers and practitioners experienced in education, school psychology, and child psychology. Given that the goal of measuring these constructs is to identify appropriate areas for intervention, great care was taken to make items behavioral so that they might be tied directly to a skill for teachers to target. Duplicate items were removed, and unclear items were reworded or removed. Wording used was

examined to ensure its consistency with a middle 3rd grade reading level. Feedback was also obtained from teachers participating in the study and difficult or unclear items were reworded. In order to reflect the developmental nature of the constructs measured, two versions were generated based on when skills are generally obtained or needed for academic success. Both measures were designed with ten scales: Study Strategies, Note-taking/Listening Skills, Reading and Writing Strategies, Writing-Research Skills, Test-taking Strategies, Organizational Techniques, Time Management, Academic Motivation, Test Anxiety, and Attention/Concentration. Table 3 lists a brief description of each scale. The original item pool consisted of 289 items on the child version and 321 items on the adolescent version. Items were presented as a statement and a student was asked to rate how often that statement is true about himself/herself. The four choices included: Never (N), Sometimes (S), Often (O), or Almost Always (A). The pilot study version of the SMALSI took approximately forty-five minutes to an hour and fifteen minutes to complete, depending on age and reading level. The final version takes approximately 20 to 30 minutes to complete, except for very young children or poor readers.

Table 3
SMALSI Scales with Descriptions

Scale	Description
Study Strategies	Selecting important information, relating new to previously learned information, and memory strategies for encoding.
Note-taking/Listening Skills	Discriminating important material when taking notes, organizing notes efficiency in note-taking.
Reading and Comprehension Strategies	Previewing, monitoring, and reviewing texts, including self-testing to ensure understanding.
Writing-Research Skills	Researching topics in a variety of ways, organizing writing projects as well as monitoring and self-checking for errors.
Test-taking Strategies	Increasing efficiency in test-taking, including eliminating unlikely answers and strategic guessing.
Organizational Techniques	Organizing class and study materials, structuring assignments including homework and other projects.

Table 3 (continued)

Scale	Description
Academic Motivation	Level of intrinsic motivation to engage and succeed in academic tasks; tendency to set mastery goals.
Test Anxiety	Student's experience of debilitating symptoms of text anxiety, lower performance on tests due to excessive worry.
Attention/Concentration	Attending to lectures and other academic tasks, monitoring and adjusting attention to performance, concentrating and the avoidance of distractions.

Behavior Assessment System for Children; Self Report Profile (BASC SRP Child, BASC SRP Adolescent; Reynolds & Kamphaus, 1992)

This child and adolescent completed measure is 126-items long and takes approximately 30 minutes to complete. Separate versions are available for children ages 8 to 11-years old (BASC SRP-C) and adolescents 12 to 18 years old (BASC-SRP-A). On both versions, subjects are provided with a behavioral description and are instructed to indicate whether that statement is "True" or "False" about them. Computer scoring of the SRP-C provides T-scores scales of Attitude to School, Attitude to Teachers, Atypicality, Social Stress, Anxiety, Depression, Sense of Inadequacy, Relations with Parents, Interpersonal Relations, Self-Esteem, and Self-Reliance. The SRP-A provides T-scores for the 11 scales on the SRP-C in addition to scales for Sensation Seeking, Locus of Control, Social Stress, and Self-Esteem. The SRP-C and SRP-A provide 4 composite scores: School maladjustment, Clinical Maladjustment, Personal Adjustment, and Emotional Symptoms Index. Validity scales provided include the F Index, a measure of "fake bad", the L Index, a measure of "faking good", and the V Index, a measure of consistent responding.

Texas Assessment of Knowledge and Skills (TAKS)

The TAKS was developed and first implemented in 2003 by the Texas Education Agency as a criterion-referenced test to determine students' mastery of basic skills beginning with grade 3 and progressing through an exit level test to graduate. Areas measured vary according to grade, including Reading, Writing, English/language arts, Mathematics, Science, and Social Studies. The test is administered in all Texas public

schools each spring. With few exceptions, students in Texas public schools must pass the grade level TAKS tests in order to advance to the next grade level and to graduate. In this study, scores were obtained for participants in at least two areas—Reading, Mathematics, Science, and Social Studies—depending on their grade on the most recent test date.

A short demographic questionnaire was also completed for the pilot study. On subsequent versions, demographics were obtained on the SMALSI answer sheet.

Data Analyses

Any test is considered to be a sample of the behavior in question. Because every possible behavior cannot be included, error is introduced. The amount of error can be impacted both by characteristics of the individual and by systematic error of the test. Preliminary analyses were conducted on the pilot sample to determine the internal coherence of the constructs being measured. Point biserial correlations are preferred for item analyses when test developers are reasonably sure that their subject sample is similar to future samples and when the goal is high internal consistency of the scales being measured (Lord & Novick, 1968, as cited in Crocker & Algina, 1986). These correlations quantify the relationship of an individual item to the scale as a whole. Therefore, they can be used to increase internal consistencies of the scales by including only those that contribute substantially to the strength of the scale. Correlations were run for 289 Child statements and 321 Adolescent statements in order to determine the contribution that each item made to the reliability of the complete scale. Internal consistencies of the 10 scales were examined following initial removal of items with low

alphas, using Cronbach's alpha to determine the resulting reliability of the scale. Additional items were removed as necessary to obtain adequate internal consistencies. Based on these analyses, the inventory was prepared for final standardization.

The degree to which test results consistently and accurately measure the intended trait is referred to as reliability. Means and standard deviations were determined for the scales standardization version and standard error measurements (SEM) were calculated as an added measure of reliability. SEM accounts for any effects of random variation by providing a range of scores that would likely contain a respondent's "true" score. Internal consistencies using Cronbach's alpha were examined for the total sample, and also across demographic groups. Average T-Scores for the scales were also examined for the total sample and for demographic groups. Interscale correlations were also examined using Pearson r.

Validity refers to the ability of a test to appropriately measure the construct it is intended to measure. It is defined as "the degree to which evidence and theory support the interpretation of test scores entailed by proposed users" (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999, p. 9). Validity among groups was examined by comparing mean T-scores for demographic groups including age, grade, ethnicity, and gender. Convergent and divergent validity was examined between scales of the SMALSI and indices of behavioral and emotional functioning from the BASC using Pearson r correlation coefficients. Convergent validity was tested using TAKS to determine the relationship between the SMALSI and school performance using Pearson correlation coefficients.

Results will be presented for the pilot study first. Then analyses for the standardization sample will be presented for the child sample, followed by the adolescent sample.

CHAPTER IV

RESULTS

This chapter details the data analyses conducted during the development of the SMALSI. First, results from the pilot study are presented, including discussion of item analyses and scale revisions, content validity, and internal consistency analyses for both Child and Teen forms. Next, results for the standardization samples are provided separately for the Child and Teen forms. Descriptions of the scales are presented for the SMALSI scales including measures of univariate normality, raw score to T-score conversions, and the inclusion of an inconsistent responding scale. Next reliability of the scales are discussed including Cronbach's alpha coefficients for the total sample and subgroups. Interscale correlations will then be presented. Evaluation of the validity of the SMALSI is examined using multiple group contrasts of T-scores and Pearson r correlations between SMALSI scales and a measure of personality, behavior and school adjustment as well as a measure of academic competence. For ease of presentation, results for the Child form are provided first, followed by the Teen form.

Preliminary Pilot Analyses

Content-based Evidence

The content of the SMALSI items was based on the theoretical constructs to be assessed and historical success with items in the research base. To analyze content-based validity, items were reviewed by individuals with doctoral degrees in Educational Psychology, Clinical Psychology, Child and Adolescent Development, and School Psychology, and a measurement consultant. Based on those expert reviews, items were

accepted for empirical tryout, rejected, or revised to enhance their coherence with the SMALSI scale constructs. Expert review and analysis of the final 147 items (Child) and 170 items (Teen) indicated item content and item coherence of the key factors. As such, the content-based evidence for validity of the SMALSI items and scales was strongly supported.

Item Analyses

The internal consistency reliability of the scores on the SMALSI Form C and Form T scales was investigated separately using Cronbach's (1951) coefficient alpha for the total samples (i.e., child and teen). Items within the scales were analyzed and items were eliminated based on overlapping, redundant wording or poor item wording (SMALSI Form C N = 142, SMALSI Form T N = 151) and if the item demonstrated low correlation to the overall scale (SMALSI Form C N = 21, SMALSI Form T N = 28). Cronbach's coefficient alphas again were run following the removal of initial items. Initial and revised SMALSI Form C and Form T scale alphas with number of items in each scale are provided in Table 4.

Table 4
Coefficient Alpha and Number of Items (in parenthesis) for Original and Revised SMALSI Form C and Form T

Scale	Form C		Form T	
	Original (*N*)	Revised (*N*)	Original (*N*)	Revised (*N*)
Student Strengths				
TEST	.62(26)	.77(12)	.79(29)	.83(15)
STUDY	.66(23)	.78(14)	.75(29)	.86(18)
WRITE	.52(23)	.71(11)	.75(30)	.78(13)
READ	.73(30)	.81(15)	.82(33)	.82(13)
NOTE	.77(25)	.81(18)	.79(32)	.87(19)
TIMORG	.68(53)	.77(18)		
TIME			.81(32)	.82(17)
ORG			.79(32)	.79(18)
Student Liabilities				
CONDIF	.82(32)	.85(18)	.83(32)	.88(17)
TANX	.87(32)	.88(21)	.89(32)	.92(23)
LOMOT	.74(42)	.83(19)	.77(38)	.83(17)

Standardization Version

Form C (Ages 8 to 12 years)

The Student Strengths subscale scores for the SMALSI Form C had a mean of 20.9 (range 1 to 45, SD = 6.9) for Study Strategies (STUDY), a mean of 29.7 (range 2 to 53, SD = 8.4) Note-Taking/Listening Skills (NOTE), a mean of 22.2 (range 0 to 49, SD = 7.5) for Reading/Comprehension Strategies (READ), a mean of 18.3 (range 0 to 33, SD = 5.3) for Writing/Research Skills (WRITE), a mean of 22.1 (range 1 to 36, SD = 6.3) for Test- Taking Strategies (TEST), and a mean of 25.7 (range 3 to 53, SD = 8.4) for Time Management/Organizational Techniques (TIMORG). The Student Liabilities subscale scores for Low Academic Motivation (LOMOT) had a mean of 13.3 (range 0 to 54, SD = 8.8), a mean of 21.7 (range 21.7 to 83.1, SD = 11.5) for Test Anxiety (TANX), and a mean of 16.8 (range 0 to 51, SD = 9.1) for Concentration/Attention Difficulties (CONDIF). Refer to Table 5.

T-scores were computed for raw scores for each of the SMALSI Form C scales. Table 5 also contains the standard errors of measurement for the SMALSI T-score and raw score distributions. These are useful in estimating the range of error about the true score and can be used to develop a confidence.

Univariate normality of the SMALSI Form C scale scores was analyzed using SPSS. Skewness for the scales ranged from -26 to .74 and Kurtosis ranged from -41 to .29. As such, all SMALSI Form C scales demonstrated adequate univariate normality. See Table 6 for skewness and kurtosis indexes.

Table 5
Mean and Standard Deviation for Raw Scores and T-Scores and Standard Error of Measurement (SEM) in the SMALSI Form C Standardization Sample

Scale (Number of items)	Raw Score M (SD)	SEM Raw Score	SEM T-Score
Student Strengths			
TEST (12)	22.1 (6.3)	± 4.9	± 3.1
STUDY (14)	20.9 (6.9)	± 4.8	± 3.5
WRITE (11)	18.3 (5.3)	± 5.6	± 3.0
READ (15)	22.2 (7.5)	± 4.6	± 3.4
NOTE (18)	29.7 (8.4)	± 4.4	± 3.7
TIMEORG (18)	25.7 (8.4)	± 4.8	± 4.0
Student Liabilities			
CONDIF (18)	16.8 (9.1)	± 3.9	± 3.5
TANX (21)	21.7 (11.5)	± 4.9	± 3.1
LOMOT (19)	13.3 (8.8)	± 4.1	± 3.6

Note. Estimates were calculated using only protocols with no missing item responses.

Table 6
Skewness and Kurtosis for SMALSI Form C Scales for Standardization Sample

Scale (Number of items)	N	Skewness	Kurtosis
Student Strengths			
TEST (12)	1341	-.26	-.16
STUDY (14)	1341	.03	-.03
WRITE (11)	1341	-.07	-.04
READ (15)	1341	.10	-.12
NOTE (18)	1341	-.05	-.10
TIMORG (18)	1341	.21	-.08
Student Liabilities			
CONDIF (18)	1341	.62	.13
TANX (21)	1341	.31	-.41
LOMOT (19)	1341	.74	.29

Note. Estimates were calculated using only protocols with no missing item responses.

An Inconsistent Responding Index score was also computed examining differences in items designed to measure identical content. The SMALSI Form C Inconsistent Responding Index (mean = 2.04, SD = 1.78) consisted of 14 item pairs. Inconsistent Responding Index item pairs were analyzed using Pearson r correlations to ensure consistent content between items. Inconsistent Responding item pair correlations for the SMALSI Form C ranged from r = .41 to r = .54 supporting like content (Table 7).

Table 7
Pearson *r* Correlations for SMALSI Form C Inconsistent Responding (INC) Index Item Pairs

INC item pair	*r*
112. Schoolwork bores me. 140. School is boring.	.54
2. I get very nervous when I take tests. 87. I worry a lot before a test.	.49
18. I listen well in class. 53. I am a good listener.	.49
51. I take regular breaks when I study. 72. I take regular breaks when I study.	.48
7. I proofread my writing two or three times before turning it in. 23. I usually go back over my answers before turning in my tests	.47
20. When my teacher gives me a test, my mind goes blank. 29. Even if I study, I cannot think of the right answers during a test.	.45
37. When the teacher is talking, I am usually thinking about something else. 43. I have a hard time listening to the teacher.	.45
46. I use extra time between classes to do homework. 130. I use free time at school to do homework.	.45
61. I often feel sick during a test. 133. Taking a test makes me feel sick to my stomach.	.45
107. I think that school is just too hard for me. 122. I feel stupid when I am at school.	.43
117. I go back and check each answer before turning in a test. 141. I proofread my work several times before turning it in.	.43
28. When I get a test back, I review the questions that I missed. 34. I look at the mistakes I made on a test so that I won't make them again.	.42

Table 7 (continued)

INC item pair	*r*
119. I worry so much about my grade that I have trouble taking a test. 142. I worry about tests more than I should.	.42
143. Teachers are not fair to most kids. 146. Most tests are unfair	.41

Reliability

Cronbach's alpha was computed for the total SMALSI Form C sample as well as separately by grade, age, gender, and ethnicity. Results are reasonably comparable across all groups. Table 8 presents alpha coefficients for the total sample. Coefficients ranged from .69 to 89, with the WRITE demonstrating the lowest internal consistency (.69). This trend was evident across age levels with the WRITE scale being most difficult for the youngest age group to respond to reliably. When separated by age, alpha coefficients for most SMALSI scales have values ranging from .60 to .91 (Table 9). When separated by grade, alpha coefficients ranged from .56 to .92. While the same trend was noted for the WRITE scale across grades, of note, 7th graders also demonstrated difficulty with responding to the READ scale reliably (Table 10).

Alpha coefficients for the SMALSI scales were also calculated separately for boys and girls (Table 8) and for American Indians, African Americans, Hispanic/Latino, and White children (Table 11) to determine if the SMALSI scales varied in internal consistency across gender or ethnicity. Results indicated commensurate alpha coefficients for the SMALSI scales across gender and ethnicity with one exception. The American Indian sample produced scores that resulted in higher reliability coefficients on multiple SMALSI scales relative to the other ethnic samples. The differences are small but consistent.

Table 8
Internal Consistency Reliability Estimates for the Total SMALSI Form C Standardization Sample and Separately by Gender

Scale	Total Sample (N = 1,134)	Boys (n = 556)	Girls (n = 573)
Student Strengths			
TEST	.76	.76	.75
STUDY	.77	.78	.77
WRITE	.69	.68	.69
READ	.79	.80	.78
NOTE	.81	.81	.80
TIMORG	.77	.77	.78
Student Liabilities			
TANX	.89	.89	.89
CONDIF	.85	.85	.85
LOMOT	.83	.84	.81

Note. The entire standardization sample includes protocols with 5 or fewer missing item responses. All protocols with missing item responses were excluded from internal consistency analyses.

Table 9
Average Alpha Reliabilities for Different Age Groups in the SMALSI Form C Standardization Sample

Scale	Age				
	8 (*n* =96)	9 (*n* =275)	10 (*n* = 335)	11 (*n* = 341)	12 (*n* = 188)
Student Strengths					
TEST	.67	.67	.78	.79	.81
STUDY	.74	.74	.77	.80	.80
WRITE	.60	.64	.71	.71	.73
READ	.80	.77	.78	.80	.83
NOTE	.75	.75	.82	.84	.84
TIMORG	.77	.74	.77	.79	.83
Student Liabilities					
TANX	.87	.86	.89	.90	.91
CONDIF	.78	.86	.85	.84	.90
LOMOT	.79	.80	.84	.84	.87

Note. Estimates were calculated using only protocols with no missing item responses.

Table 10
Average Alpha Reliabilities for Different Grades in the SMALSI Form C Standardization Sample

Scale	Grade				
	3 (n = 248)	4 (n = 308)	5 (n = 399)	6 (n = 195)	7 (n = 85)
Student Strengths					
TEST	.68	.73	.79	.80	.64
STUDY	.76	.75	.76	.80	.61
WRITE	.64	.68	.71	.72	.57
READ	.80	.78	.77	.86	.56
NOTE	.77	.77	.83	.86	.72
TIMORG	.75	.75	.80	.80	.77
Student Liabilities					
TANX	.86	.88	.89	.92	.88
CONDIF	.82	.86	.85	.88	.82
LOMOT	.79	.85	.82	.88	.75

Note. Estimates were calculated using only protocols with no missing item responses.

Table 11
Average Alpha Reliabilities for Students from Different Ethnic Backgrounds in the SMALSI Form C Standardization Sample

Scale	Ethnicity			
	American Indian (n = 65)	African American (n = 276)	Hispanic/ Latino (n = 109)	White (n = 651)
Student Strengths				
TEST	.86	.72	.75	.75
STUDY	.83	.76	.73	.78
WRITE	.79	.65	.67	.69
READ	.84	.79	.77	.79
NOTE	.87	.79	.78	.81
TIMORG	.87	.75	.72	.78
Student Liabilities				
TANX	.89	.85	.85	.90
CONDIF	.84	.84	.85	.86
LOMOT	.81	.79	.80	.86

Note. Estimates were calculated using only protocols with no missing item responses.

Table 12

Interscale Correlations for the SMALSI Form C Standardization Sample

Scale	Student Strengths						Student Liabilities		
	STUDY	NOTE	READ	WRITE	TEST	TIMORG	LOMOT	TANX	CONDIF
Student Strengths									
STUDY		.62	.67	.52	.67	.69	-.15	.29	-.13
NOTE	.72		.72	.65	.68	.70	-.27	-.04	-.30
READ	.70	.74		.65	.70	.66	-.32	.05	.25
WRITE	.65	.52	.50		.63	.53	-.28	.06	-.28
TEST	. 71	.60	.70	.51		.54	-.25	-.16	-.31
TIMEORG	.71	.71	.67	.63	.63		-.12	-.02	-.21
Student Liabilities									
LOMOT	-.28	-.39	-.29	-.34	-.44	-.28		.45	.70
TANX	.11	.10	-.02	-.04	-.06	.17	.44		.52
CONDIF	-.17	-.19	-.29	-.23	-.37	-.09	.68	.50	

Note. VALUES BELOW THE DIAGONAL: N = 1134. Correlations were calculated only including protocols with 5 or fewer missing responses. All protocols with missing item responses were excluded from internal consistency analyses. VALUES ABOVE THE DIAGONAL: Values for 96 students, 8 years of age, with no missing item responses (Stroud & Reynolds, 2006).

Interscale Correlations

The relations between the SMALSI Form C scales were computed using Pearson r correlations (Table 12). Student strength scales were highly correlated with each other with Pearson r correlations ranging from .50 to .74. Student Liabilities scales were significantly positively correlated with each other with correlations ranging from .45 to .70. Correlations between Student Strength scales and Student Liabilities scales revealed that LOMOT was negatively correlated with WRITE (r = -.34), NOTE (r = -.39), and TEST (r = -.44). CONDIF was significantly negatively correlated with TEST (r = -.37).

Validity for Child Form

Multiple Group Contrasts

Average T-Scores for the SMALSI Form C scales were calculated separately by demographic variables (i.e., gender, grade, age, and ethnicity). Differences in mean T-scores for groups (e.g., boys and girls or American Indians, African Americans, Hispanic/Latino, and White children) were analyzed using one-sample T-tests to determine significant differences in scores according to demographic variables. Mean T-scores for each SMALSI Form C scale were computed for each demographic group. These mean T-scores were compared to the expected mean T-score of 50.

Gender. Resulting T-tests examining mean T-scores of boys and girls for each of the SMALSI Form C scales indicated significant differences in the mean T-scores for boys and for girls (Table 13). Overall, girls' mean T-score was significantly elevated for the Student Strengths scales of NOTE, WRITE, and TEST and significantly lower in the Student Liabilities scales of LOMOT and CONDIF. The boys' mean T-score was

significantly lower for the Student Strengths scales of NOTE, WRITE, and TEST, and significantly elevated for LOMOT and CONDIF. As such, the girls demonstrated more positive scores across these scales in comparison with the boys. The effect sizes are comparable to what one finds in other, independent research, with the direction of the differences also consistent with previous literature (e.g., Reynolds & Kamphaus, 2004).

Age. Resulting T-tests examining mean T-scores of different age groups for each of the SMALSI Form C scales indicated significant differences in the mean T-scores separately by age (i.e., 8, 9, 10, 11, and 12 years-old). Refer to Table 14. More specifically, 9-year-old children had significantly elevated mean T-scores on the READ (Mean *T* = 51.5, ES = .15) and TEST (Mean *T* = 51.2, ES = .12) scales indicating more fully developed skills in these areas. In addition, 12-year-old children had significantly elevated LOMOT (Mean *T* = 53.2, ES = .32) and CONDIF (Mean T = 53.0, ES = .30) mean T-scores indicating increased difficulties in these areas.

Table 13
Group Average T-Scores for the SMALSI Scales for Gender

Scale	Gender			
	Boys	*es*	Girls	*es*
	(*n* = 894)		(*n* = 916)	
Student Strengths				
TEST	48.6*	*.14*	51.3*	*.13*
STUDY	49.1	-	50.8	-
WRITE	48.9*	*.11*	51.0*	*.10*
TIMORG	49.7	-	50.3	-
READ	49.4	-	50.6	-
NOTE	49.0*	*.10*	51.0*	*.10*
Student Liabilities				
CONDIF	51.4*	*.14*	48.7*	*.13*
TANX	49.3	-	50.7	-
LOMOT	51.5*	*.15*	48.6*	*.14*

Note. *p<.01 for a one-sample t-test comparing the obtained value with the expected mean of 50T. Numbers in italics are effect sizes.

Table 14
Average T-Scores for Different Age Groups in the SMALSI Form C Standardization Sample

Scale	Age (*n*)						
	8	9	*es*	10	11	12	*Es*
	(151)	(426)		(519)	(454)	(271)	
Student Strengths							
TEST	49.7	51.2*	*.12*	49.8	49.6	49.1	
STUDY	48.1	50.7		49.9	50.3	49.6	
WRITE	50.2	50.8		49.9	49.7	49.2	
TIMORG	48.8	50.7		49.4	50.5	50.2	
READ	50.3	51.5*	*.15*	50.1	48.9	48.6	
NOTE	48.7	50.1		49.9	49.9	51.1	
Student Liabilities							
CONDIF	48.9	48.7		49.9	50.5	53.0*	*.30*
TANX	50.8	50.4		50.1	49.6	49.5	
LOMOT	48.6	49.1		49.9	50.0	53.2*	*.32*

Note. *p<.01 for a one-sample t-test comparing the obtained value with the expected mean of 50T. Effect sizes in italics.

Grade. Resulting T-tests examining mean T-scores of different grade groups for each of the SMALSI Form C scales indicated significant differences in the mean T-scores separately by grade (i.e., 3rd, 4th, 5th, 6th, and 7th grade). More specifically, 6th grade children had significantly elevated mean T-scores on the LOMOT (Mean T = 51.8, ES =.18) and CONDIF (Mean T = 51.8, *ES* = .18). In addition, 7th grade children had significantly lowered mean T-scores on the READ (Mean T = 45.3, *ES* = .47) and TEST (Mean T = 46.7, *ES* = .33) scales, and also had elevate mean T-scores on the LOMOT (Mean T = 52.6, *ES* = .26) and CONDIF (Mean T = 53.0, *ES* = .30) scales. Average T-scores and effect sizes are reported in Table 15.

Ethnicity. Resulting T-tests examining mean T-scores of different ethnic groups for each of the SMALSI Form C scales indicated significant differences in the mean T-scores separately by ethnicity (i.e., American Indians, African Americans, Hispanic/Latino, and White children). More specifically, American Indian/Alaska Native children had significantly lowered mean T-score on the WRITE scale (Mean *T* = 46.6, *ES* = .34) and elevated mean T-score on the LOMOT (Mean *T* = 53.1, *ES* = .31). Black/African American children had significantly elevated mean T-scores on the STUDY (Mean *T* = 52.2, *ES* = .22), NOTE (Mean *T* = 51.3, *ES* = .13), READ (Mean *T* = 52.3, *ES* = .23), and TIMORG (Mean *T* = 51.4, *ES* = .14) scales. Hispanic Latino children had significantly lowered mean T-score on the CONDIF scale (Mean *T* = 47.8, *ES* = .22). Average T-scores and effect sizes are reported in Table 16.

Table 15
Average T-Scores and Effect Sizes (*es*) for Students from Different Grades in the SMALSI Form C Standardization Sample

Scale	Grade (*n*)						
	3	4	5	6	*es*	7	*Es*
	(390)	(502)	(558)	(262)		(109)	
Student Strengths							
TEST	50.6	50.6	49.5	49.9		46.1*	*.39*
STUDY	49.8	50.2	50.0	50.3		47.9	
WRITE	50.8	50.4	49.3	50.0		49.0	
TIMORG	50.2	50.2	49.2	51.9		52.0	
READ	51.4	51.0	48.9	49.1		45.3*	*.47*
NOTE	49.5	50.1	50.0	50.9		49.6	
Student Liabilities							
CONDIF	48.8	49.2	50.4	51.8*	*.18*	53.0*	*.30*
TANX	50.7	50.4	49.6	48.9		47.8	
LOMOT	49.2	49.3	50.1	51.8*	*.18*	52.6*	*.26*

Note. *p<.01 for a one-sample t-test comparing the obtained value with the expected mean of 50T. Numbers in italics are effect sizes.

Table 16
Average *T*-Scores for Students from Different Ethnic Backgrounds in the SMALSI Form C Standardization Sample

Scale	Ethnicity					
	American Indian[a] (*n* = 90)	*es*	African American (*n* = 504)	*es*	Hispanic/ Latino (*n* = 151)	*es*
Student Strengths						
TEST	47.4		50.8		50.6	
STUDY	48.3		52.2*	*.22*	49.3	
WRITE	46.6*	*.34*	50.8		49.0	
READ	47.6		52.3*	*.23*	50.0	
NOTE	48.5		51.3*	*.13*	48.1	
TIMORG	48.3		51.4*	*.14*	49.2	
Student Liabilities						
TANX	51.0		52.4*	*.24*	50.7	
CONDIF	52.3		50.6		47.8*	*.22*
LOMOT	53.1*	*.31*	50.0		50.5	

Note. *$p<.01$ for a one-sample *t*-test comparing the obtained value with the expected mean of 50*T*. Numbers in italics are effect sizes.

Regional. Given the larger number of participants in the South geographical region (52%), resulting T-tests examining mean T-scores of children from the South as compared to the Northeast, Midwest, and West for each of the SMALSI Form C scales were examined. Results indicated significant differences in the mean T-scores separately by region of the United States. More specifically, children from the South had significantly elevated mean T-scores on the STUDY (Mean T = 51.0, *ES* = .10), READ (Mean T = 50.9, *ES* = .09), and TANX (Mean T = 50.9, *ES* = .09) scales. Children from the Northeast, Midwest, and West had significantly lower mean T-scores on the STUDY (Mean T = 49.0, ES = .10), READ (Mean T = 49.0, *ES* = .10), and TANX (Mean T = 49.0, *ES* = .10) scales. Average T-scores and effect sizes are reported in Table 17.

Relationship with Measure of Personality, Behavior, and School Adjustment

A group of 23 children completed the Behavior Assessment System for Children (BASC) Self-Report of Personality-Child (SRP-C; Reynolds & Kamphaus, 1992) in addition to the SMALSI Form C. Pearson correlations for the relations between the SMALSI Form C and the BASC SRP-C are reported in Table 18.

The SMALSI Form C TANX and CONDIF scales clearly provide the strongest relationships between the SMALSI scales and the BASC SRP-C scales. In general, Student Liabilities scales were positively correlated with Clinical Maladjustment Scales (e.g., Atypicality, Locus of Control) and School Maladjustment (e.g., Attitude to School, Sensation Seeking) and Emotional Symptom Index. Results also indicate that several Student Strength scales were negatively correlated with BASC scales. For example, students who score higher on the SRP-C Depression scale are less likely to obtain high

scores on TEST and NOTE and more likely to have high scores on CONDIF (indicating attention and concentration problems). Depression clearly appears to have a detrimental affect on LOMOT. Overall, the pattern of relationships seen in Table 18 is strongly supportive of the validity as well as utility of the SMALSI Form C scales.

Table 17
Average T-Scores for Students from Different US Regions in the SMALSI Form C Standardization Sample

Scale	Geographic Region			
	South (n = 892)	*es*	Northeast, Midwest, West (n = 822)	*es*
Student Strengths				
TEST	50.3		49.7	
STUDY	51.0*	*.10*	49.0*	*.10*
WRITE	50.6		49.3	
TIMORG	50.6		49.3	
READ	50.9*	*.09*	49.0*	*.10*
NOTE	50.4		49.6	
Student Liabilities				
CONDIF	49.8		50.2	
TANX	50.9*	*.09*	49.0*	*.10*
LOMOT	49.6		50.5	

Note. *p<.01 for a one-sample t-test comparing the obtained value with the expected mean of 50T. Numbers in italics are effect sizes.

Table 18
Pearson Correlations Between SMALSI Form C Scales and BASC Scales

BASC scale	SMALSI Scale								
	Student Strengths						Student Liabilities		
	STUDY	NOTE	READ	WRITE	TEST	TIMORG	LOMOT	TANX	CONDIF
Attitude to School	-.40*	-.71**	-.60**	-.55**	-.45*	-.51**	.72**	.41*	.60**
Attitude to Teachers	-.22	-.52**	-.26	-.20	-.28	-.19	.81**	.25	.79**
Atypicality	-.24	-.49**	-.35	-.28	-.44*	-.10	.43*	.34	.61**
Locus of Control	-.18	-.39*	-.23	-. 26	-.44*	-.01	.44*	.66**	.68**
Social Stress	.01	-.24	-.15	-.11	-.26	.14	.30	.45*	-.50**
Anxiety	.22	-.08	.06	-.02	-.08	.23	.16	.61**	.48**
Depression	-.33	-.50**	-.26	-.45*	-.53**	-.10	.53**	.63**	.62**
Sense of Inadequacy	-.18	-.52**	-.21	-.47*	-.34	-.22	.63**	.65**	.62**
Relations with Parents	.12	.22	.19	.18	.18	-.11	-.36	-.27	-.44*
Interpersonal Relations	-.03	.22	.08	. 37*	.11	.04	-.29	-.35	-.25
Self-Esteem	.05	.29	.05	. 41*	.19	-.11	-.21	-.64**	-.31
Self-Reliance	.30	.59**	.47*	.51**	.37*	.27	-.62**	-.41*	-.54**
School Maladjustment	-.33	-.66**	-.45*	-.40*	-.40*	-.37*	.83**	.35	.76**
Clinical Maladjustment	-.04	-.33	-.18	-.19	-.34	.08	.36	.57**	.62**
Personal Adjustment	.15	.42*	.26	.46*	.28	.02	-.46*	-.55**	-.49**
Emotional Symptoms Index	-.07	-.38*	-.14	-.36	-.31	.03	.43*	.68**	.57**

Note. *p<.05. **p<.01. Stroud & Reynolds (2006).

Relations with Measures of Academic Competence

To assess the relationship of SMALSI Form C scale scores to academic success in the classroom setting, Texas Assessment of Knowledge and Skills (TAKS) scores were obtained from the records of 32 children. Table 19 reports the Pearson r correlations between the SMALSI Form C scale scores and the TAKS scores for Reading, Math, and Science. Correlations between the SMALSI Form C scales as TAKS Reading and Math scales ranged from .04 to .48. For the SMALSI Form C, the STUDY (r = .38, $p \leq .05$), WRITE *(*r = .48, $p \leq .01$), and TIMEORG (r = .45, $p \leq .05$) scales demonstrated significant relations with actual academic mastery of reading processes. WRITE (r = .41, $p \leq .05$) and TANX (r = -.39, $p \leq .05$) demonstrated significant relations with mastery of math skills. The correlations between the SMALSI scale scores and scores on the TAKS Science score, while not statistically significant, are in the predicted direction.

Table 19
Correlations of TAKS scores with SMALSI Form C Scales

	TAKS Raw Scores		
SMALSI Scale	Reading	Math	Science
Student Strengths			
TEST	.29	.11	.11
STUDY	.38*	.12	.30
WRITE	.48**	.41*	.14
READ	.25	.09	-.11
NOTE	.34	.13	.03
TIMEORG	.45*	.13	.13
Student Liabilities			
LOMOT	-.09	-.05	.03
TEST	-.15	-.39*	-.03
CONDIF	.09	.04	.07

Note. *p<.05. **p<.01. Stroud & Reynolds (2006).

Form T (Ages 13 to 18 years)

The Student Strengths subscale scores for the SMALSI Form T had a mean of 24.5 (range 0 to 54, SD = 8.8) for Study Strategies (STUDY), a mean of 25.1 (range 0 to 57, SD = 9.1) for Note-Taking/Listening Skills (NOTE), a mean of 16.8 (range 0 to 39, SD = 6.6) for Reading/Comprehension Strategies (READ), a mean of 19.6 (range 0 to 39, SD = 6.2) for Writing/Research Skills (WRITE), a mean of 25.2 (range 0 to 45, SD = 8.0) for Test- Taking Strategies (TEST), a mean of 25.8 (range 4 to 52, SD = 7.8) for Organizational Techniques (ORG), and a mean of 21.0 (range 0 to 51, SD = 7.6) for Time Management (TIME). The Student Liabilities subscale scores for Low Academic Motivation (LOMOT) had a mean of 15.1 (range 0 to 51, SD = 8.0), a mean of 23.1 (range 22.5 to 82.4, SD = 11.7) for Test Anxiety (TANX), and a mean of 20.8 (range 0 to 51, SD = 9.1) for Concentration/Attention Difficulties (CONDIF). Refer to Table 20.

Table 20 also contains the standard errors of measurement for the SMALSI T-score and raw score distributions. These are useful in estimating the range of error about the true score and can be used to develop a confidence.

Univariate normality of the SMALSI Form T scale scores was analyzed using SPSS. Skewness for the scales ranged from -.12 to .28 and Kurtosis ranged from -.23 to .35. As such, all SMALSI Form T scales demonstrated adequate univariate normality. See Table 21 for skewness and kurtosis indexes.

Table 20
Mean and Standard Deviation for Raw Scores and T-Scores and Standard Error of Measurement (SEM) in the SMALSI Form T Standardization Sample

Scale (Number of items)	Raw Score	SEM	
	M (SD)	Raw Score	T-Score
Student Strengths			
TEST (15)	25.2 (8.0)	± 3.2	± 4.0
STUDY (18)	24.5 (8.8)	± 3.3	± 3.7
WRITE (13)	19.6 (6.2)	± 3.0	± 4.8
READ (13)	16.8 (6.6)	± 2.8	± 4.2
NOTE (19)	25.1 (9.1)	± 3.4	± 3.7
TIME (17)	21.0 (7.6)	± 3.3	± 4.4
ORG (18)	25.8 (7.8)	± 3.6	± 4.6
Student Liabilities			
CONDIF (17)	20.8 (9.1)	± 3.2	± 3.5
TANX (23)	23.1 (11.7)	± 3.5	± 3.0
LOMOT (17)	15.1 (8.0)	± 3.3	± 4.1

Note. Estimates were calculated using only protocols with no missing item responses (N = 1,100). Stroud & Reynolds (2006).

Table 21
Skewness and Kurtosis for SMALSI Form T Scales for Standardization Sample

Scale (Number of items)	N	Skewness	Kurtosis
Student Strengths			
TEST (15)	1046	-.11	-.15
STUDY (18)	1046	-.03	.04
WRITE (13)	1046	-.10	.13
READ (13)	1046	.18	.04
NOTE (19)	1046	.17	.25
TIME (17)	1046	.22	.35
ORG (18)	1046	.28	.13
Student Liabilities			
CONDIF (17)	1046	.25	-.23
TANX (23)	1046	.01	-.08
LOMOT (17)	1046	.51	-.20

Note. Estimates were calculated using only protocols with no missing item responses.

An Inconsistent Responding Index score was also computed examining differences in items designed to measure identical content. The SMALSI Form T Inconsistent Responding Index (mean = 1.88, *SD* = 1.77) consisted of 15 item pairs. Inconsistent Responding Index item pairs were analyzed using Pearson r correlations to ensure consistent content between items. Pearson r correlations for the SMALSI Form T ranged from *r* = .43 to *r* = .57, supporting like content (Table 22).

Table 22
Pearson *r* Correlations for SMALSI Form T Inconsistent Responding (INC) Index Item Pairs

INC item pair	*r*
167. School is boring. 170. Schoolwork bores me.	.57
5. I write the dates of weekly tests and other work for class on a calendar. 87. I use a calendar to keep track of big assignments.	.56
21. I go back over my answers before turning in my tests. 114. I go back and check each answer before turning in a test.	.55
17. When my teacher gives me a test, my mind goes blank. . 22. Even if I study, I cannot think of the right answers during a test.	.54
24. When I get a test back, I review the questions that I missed. 32. I pay attention to the mistakes I made on a test so that' won't make them again.	.49
84. I try to relate what I read to other things I already know. 92. When my teacher is introducing something, I try to tie the new information to things I already know.	.48
113. I don't like to come to school. 167. School is boring.	.48
149. I listen well in class. 159. I listen to my teacher.	.48
123. Taking a test makes me feel sick to my stomach. 158. I get sick before a really big test.	.47
47. When I finish reading a passage, I go back to look at important points and key words. 82. After reading a passage, I review the main points.	.44

Table 22 (continued)

INC item pair	*r*
55. When reading, I make a list of words I don't understand so that I can look them up or ask someone what they mean 56. When I have questions, I write them down.	.44
67. I have to study much more than others to learn the same things. 138. Other kids seem to learn things faster than I do.	.44
79. I have trouble getting to class on time. 143. I am often late getting to school.	.44
90. I try to avoid homework for' as long as I can. 121. I put off turning in homework for as long as I can.	.44
3. My mind wanders a lot in class. 28. I have a hard time listening to the teacher.	.43

Reliability

Cronbach's alpha was computed for the entire SMALSI Form T sample as well as separately by grade, age, gender, and ethnicity. Results are reasonably comparable across all groups. Table 23 presents alpha coefficients for the total sample. Coefficients ranged from .79 to 86, When separated by age and grade, alpha coefficients were commensurate, with values for age ranging from .65 to .90 (Table 24) and values for grade ranging from .69 to .92 (Table 25).

Alpha coefficients for the SMALSI scales were also calculated separately for boys and girls (Table 23) and for American Indians, African Americans, Hispanic/Latino, and White children (Table 26) to determine if the SMALSI scales varied in internal consistency across gender or ethnicity. Results indicated commensurate alpha coefficients for the SMALSI scales across gender and ethnicity with one exception. The American Indian sample produced scores that resulted in higher reliability coefficients on SMALSI Form T scales relative to the other ethnic samples. The differences are small but consistent with trends reported in Form C.

Interscale Correlations

Relations between the Form T scales were computed using Pearson r correlations (Table 27). Student Strength scales were highly correlated with each other with Pearson r correlations ranging from .63 to .78. Student Liabilities scales were significantly positively correlated with each other with correlations ranging from .49 to .71. Correlations between Student Strengths scales and Student Liabilities scales revealed that CONDIF was negatively correlated with NOTE (r = -.37 and ORG (r = -.44).

Table 23
Internal Consistency Reliability Estimates for the SMALSI Form T Standardization Sample

Scale (# items)	Total (N = 776)	Boys (n = 319)	Girls (n = 451)
Student Strengths			
TEST (15)	.84	.84	.84
STUDY(18)	.86	.86	.84
WRITE (13)	.77	.77	.74
READ (13)	.82	.82	.82
NOTE (19)	.86	.85	.86
TIME (17)	.81	.81	.82
ORG (18)	.79	.76	.80
Student Liabilities			
TANX (23)	.91	.88	.92
CONDIF (17)	.88	.87	.89
LOMOT (17)	.83	.80	.85

Note: The entire standardization sample includes protocols with 5 or fewer missing item responses. All protocols with missing item responses were excluded from internal consistency analyses. Stroud & Reynolds (2006).

Table 24
Alpha Reliabilities for Different Age Groups in the SMALSI Form T Standardization Sample.

Scale	Age					
	13 (*n*=104)	14 (*n*=120)	15 (*n*=139)	16 (*n* = 174)	17 (*n*=150)	18 (*n*=89)
Student						
Strengths						
TEST	.83	.85	.86	.83	.83	.86
STUDY	88	.85	.88	.83	.85	.82
WRITE	.73	.80	.79	.71	.77	.71
READ	.85	.84	.85	.80	.79	.82
NOTE	.87	.87	.89	.83	.86	.85
TIME	.79	.84	.82	.80	.80	.83
ORG	.75	.79	.82	.73	.81	.83
Student						
Liabilities						
TANX	.91	.90	.92	.90	.90	.92
CONDIF	.88	.88	.89	.87	.89	.89
LOMOT	.84	.84	.83	.81	.85	.80

Note: Estimates were calculates only for protocols with no missing item responses. Stroud & Reynolds (2006).

Table 25
Average Alpha Reliabilities for Different Grades in the SMALSI Form T Standardization Sample

Scale	Grade					
	7 (*n*=84)	8 (*n*=68)	9 (*n*=130)	10 (*n*=200)	11 (*n*=115)	12 (*n*=179)
Student Strengths						
TEST	.84	.82	.85	.83	.85	.85
STUDY	.88	.89	.81	.86	.86	.84
WRITE	.77	.80	.74	.78	.69	.73
READ	.83	.82	.80	.84	.80	.82
NOTE	.86	.90	.85	.86	.86	.86
TIME	.81	.84	.79	.81	.78	.83
ORG	.77	.81	.76	.79	.76	.82
Student Liabilities						
TANX	.92	.91	.90	.92	.89	.92
CONDIF	.89	.83	.90	.89	.83	.90
LOMOT	.86	.82	.81	.82	.79	.85

Note. Estimates were calculated using only protocols with no missing item responses. Stroud & Reynolds (2006).

Table 26
Alpha Reliabilities Students from Different Ethnic Backgrounds in the SMALSI Form T Standardization Sample

Scale	Ethnicity			
	American Indian (n = 69)	African American (n = 155)	Hispanic/ Latino (n = 110)	White (n = 362)
Student Strengths				
TEST	.90	.84	.85	.82
STUDY	.92	.82	.84	.84
WRITE	.86	.71	.78	.74
READ	.89	.79	.84	.77
NOTE	.92	.84	.86	.85
TIME	.89	.81	.83	.80
ORG	.81	.74	.84	.79
Student Liabilities				
TANX	.95	.89	.91	.91
CONDIF	.93	.88	.87	.87
LOMOT	.87	.81	.86	.82

Note. Estimates were calculated using only protocols with no missing item responses. Stroud & Reynolds (2006).

Table 27
Interscale Correlations for the SMALSI Form T Standardization Sample

Scale	Student Strengths							Student Liabilities		
	STUDY	NOTE	READ	WRITE	TEST	ORG	TIME	LOMOT	TANX	CONDIF
Student Strengths										
STUDY						.				
NOTE	.78									
READ	.78	.78								
WRITE	.63	.63	.66							
TEST	.78	.75	.72	.63						
ORG	.66	.74	.61	.55	.66					
TIME	.73	.73	.68	.60	.67	.72				
Student Liabilities										
LOMOT	-.13	-.22	-.14	-.15	-.25	-.29	-.16			
TANX	.20	.09	.08	.03	.04	.01	.06	.61		
CONDIF	-.18	-.37	-.22	-.09	-.28	-.44	-.24	.49	.71	

Note. N = 776. Correlations were calculated only including protocols with 5 or fewer missing responses. Stroud & Reynolds (2006).

Validity for Teen Form

Multiple Group Contrasts

Average T-Scores for the SMALSI Form C scales were calculated separately by demographic variables (i.e., gender, grade, age, and ethnicity). Differences in mean T-scores for groups were analyzed using one-sample T-tests to determine significant differences in scores according to demographic variables as described previously. Mean T-scores for each SMALSI Form T scale were computed for each demographic group. These mean t-scores were compared to the expected mean T-score of 50.

Gender. Resulting T-tests examining mean T-scores of boys and girls for each of the SMALSI Form T scales indicated significant differences in the mean T-scores for boys and for girls (Table 28). Overall, girls' mean T-scores were significantly elevated for all of the Student Strengths scales and were significantly elevated in the Student Liabilities scale of TANX. The boys' mean T-scores were significantly lower for all of the Student Strengths scales and significantly lower for the Student Liabilities scale of TANX. As such, the girls demonstrated more positive scores across most scales in comparison with the boys, with the exception of reporting increased Test Anxiety. The effect sizes are comparable to what one finds in other, independent research, with the direction of the differences also consistent with previous literature (e.g., Reynolds & Kamphaus, 2004).

Table 28
Average *T*-Scores for Boys and Girls in the SMALSI Form T Standardization Sample

Scale	Boys (n = 488)	*es*	Girls (n = 598)	*es*
Student Strengths				
TEST	47.6*	*.24*	51.9*	*.19*
STUDY	47.8*	*.22*	51.8*	*.18*
WRITE	47.6*	*.24*	51.9*	*.19*
READ	48.6*	*.14*	51.1*	*.11*
NOTE	48.1*	*.19*	51.6*	*.16*
TIME	48.6*	*.14*	51.1*	*.11*
ORG	48.0*	*.10*	51.6*	*.16*
Student Liabilities				
TANX	48.8*	*.12*	51.0*	*.10*
CONDIF	50.3		49.8	
LOMOT	50.8		49.4	

Note: *p<.01 for a one-sample *t*-test comparing the obtained value with the expected mean of 50*T*. Numbers in italics are effect sizes. Stroud & Reynolds (2006).

Age. Resulting T-tests examining mean T-scores of different age groups for each of the SMALSI Form T scales indicated significant differences in the mean T-scores separately by age (i.e.,13, 14, 15, 16, 17, and 18 years-old). Table 29 presents mean T-scores by age group. More specifically, 13 and 14-year-old teenagers had significantly decreased mean T-scores on the WRITE (Mean *T* = 46.7, *ES* = .26; Mean *T* = 47.5, *ES* = .25 respectively) while 18-year-old teenagers had a significantly elevated WRITE mean t-score (Mean T = 53.3, *ES* = .33). In addition, 17-year-olds had a significantly elevated mean T-score for TEST (Mean T = 52.3, *ES* = .23) and 18-year-olds had a significantly elevated ORG mean T-score (Mean T = 52.6, *ES* = .26) indicating more fully developed skills in these areas.

Grade. Resulting T-tests examining mean T-scores of different grade groups for each of the SMALSI Form C scales indicated significant differences in the mean T-scores separately by age (i.e., 7^{th}, 8^{th}, 9^{th}, 0^{th}, 11^{th}, and 12^{th} grade). More specifically, 8^{th} grade children had significantly lowered mean T-scores on several Student Strengths scales (i.e., STUDY, NOTE, WRITE, TEST, and ORG) and significantly elevated mean t-score for Student Liability scales of LOMOT and CONDIF, suggesting increased average difficulties in these areas. Mean T-scores for 12^{th} graders indicated significantly elevated means for all Student Strength scales with the exception to TIME, indicating more fully developed skills in these areas. In addition 9^{th} graders evidenced a lowered mean T-score for WRITE. Average T-scores and effect sizes are reported in Table 30.

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Table 29
Average *T*-Scores for Different Age Groups in the SMALSI Form T Standardization Sample

Scale	Age (*n*)									
	13	*es*	14	*es*	15	16	17	*es*	18	*es*
	(140)		(199)		(203)	(249)	(199)		(110)	
Student Strengths										
TEST	47.9		48.5		50.2	49.7	52.3*	*.23*	51.7	
STUDY	47.8		49.1		50.1	49.7	51.9		51.9	
WRITE	46.7*	*.33*	47.5*	*.25*	50.1	50.5	52.3		53.3*	*.33*
TIME	49.0		48.8		50.2	49.7				
READ	47.4*	*.26*	49.2		50.5	49.8	51.7		51.3	
NOTE	48.4		49.1		49.7	49.2	52.2		52.0	
ORG	48.4		48.4		49.7	49.8	51.8		52.6*	*.26*
Student Liabilities										
CONDIF	49.7		51.5		49.6	50.2	48.9		50.0	
TANX	49.8		51.3		50.2	49.0	49.7		50.4	
LOMOT	50.0		51.6		49.8	49.6	48.9		50.5	

*p<.01 for a one-sample *t*-test comparing the obtained value with the expected mean of 50*T*. Numbers in italics are effect sizes.

Table 30
Average *T*-Scores for Students from Different Grades in the SMALSI Form T Standardization Sample

Scale	Grade (*n*)								
	7	8	*es*	9	*es*	10	11	12	*es*
	(114)	(125)		(183)		(283)	(166)	(229)	
Student Strengths									
TEST	47.9	46.9*	*.31*	49.6		50.7	49.7	52.4*	*.24*
STUDY	49.1	46.8*	*.32*	49.5		50.5	50.1	52.0*	*.20*
WRITE	47.2	46.1*	*.39*	48.1*	*.11*	51.1	50.0	53.6*	*.36*
TIME	49.4	47.8		48.6		51.1	49.6	51.6	
READ	47.9	47.6		49.8		50.1	50.6	52.0*	*.20*
NOTE	49.3	47.1*	*.29*	49.7		49.8	50.6	52.1*	*.21*
ORG	48.9	47.0*	*.30*	48.7		50.3	51.1	52.1*	*.21*
Student Liabilities									
CONDIF	49.5	52.5*	*.25*	49.7		49.8	49.6	49.7	
TANX	51.1	51.0		49.7		49.9	49.7	49.6	
LOMOT	50.7	53.1*	*.31*	49.1		49.5	50.4	49.0	

*$p<.01$ for a one-sample *t*-test comparing the obtained value with the expected mean of 50*T*. Numbers in italics are effect sizes. Stroud & Reynolds (2006).

Ethnicity. Resulting T-tests examining mean T-scores of different ethnic groups for each of the SMALSI Form T scales indicated significant differences in the mean T-scores separately by ethnicity (i.e., American Indians, African Americans, Hispanic/Latino, and White children). More specifically, American Indian/Alaska Native children had significantly lowered mean T-score on the WRITE scale (Mean *T* = 45.8, *ES* = .42). Black/ African American children had significantly elevated mean T-scores on the STUDY (Mean *T* = 52.2, *ES* = .22), NOTE (Mean *T* = 52.73, *ES* = .27), READ (Mean *T* = 54.2, *ES* = .42), and Test-Taking Strategies (Mean *T* = 51.8, *ES* = .18) and significantly lowered mean T-score for CONDIF (Mean *T* = 52.247.4, *ES* = .26). Hispanic Latino children had significantly lowered mean T-score on the STUDY scale (Mean *T* = 47.8, *ES* = .22), WRITE (Mean *T* = 47.0, *ES* = .30), and TIME (Mean *T* = 47.7, *ES* = .23). Average T-scores and effect sizes are reported in Table 31.

Relationship with Measures of Personality, Behavior, and School Adjustment

The relations between personality, behavior, and school adjustment were examined by Pearson r correlations between the SMALSI Form T scales and the BASC SRP subscale and composite scores in a sample of 24 teens. With the exception of the TANX scale, all of the SMALSI Form T scales are related at a moderate or higher level to the BASC Attitude to School scale and School Maladjustment Scale. In addition, the BASC Depression scale was generally negatively correlated with Student Strengths (i.e., STUDY, NOTE, READ, TEST, and TIME) and positively correlated with Student Liability scales (i.e., LOMOT and CONDIF). The BASC Self-Reliance Scale demonstrated opposite effects with positive correlations to multiple Student Strength

Table 31
Average *T*-Scores for Students from Different Ethnic Backgrounds in the SMALSI Form T Standardization Sample

Scale	Ethnicity					
	American Indian[a] (*n* = 83)	*es*	African American (*n* = 285)	*es*	Hispanic/ Latino (*n* = 171)	*es*
Student Strengths						
TEST	48.8		51.8*	*.18*	48.6	
STUDY	49.1		52.2*	*.22*	47.8*	*.22*
WRITE	45.8*	*.42*	50.2		47.0*	*.30*
READ	49.2		54.2*	*.42*	48.4	
NOTE	49.7		52.7*	*.27*	48.3	
TIME	47.4		50.8		47.7*	*.23*
ORG	47.6		50.8		48.6	
Student Liabilities						
TANX	49.4		50.3		50.7	
CONDIF	50.6		47.4*	*.26*	50.3	
LOMOT	53.1*	*.31*	50.0		50.5	

Note. *p<.01 for a one-sample *t*-test comparing the obtained value with the expected mean of 50*T*. Numbers in italics are effect sizes. Stroud & Reynolds (2006).

Table 32
Pearson Correlations Between SMALSI Form T Scales and BASC Scales

BASC scale	SMALSI Scale									
	Student Strengths							Student Liabilities		
	STUDY	NOTE	READ	WRITE	TEST	TIME	ORG	LOMOT	TANX	CONDIF
Attitude to School	-.55**	-.69**	-.54**	-.53**	-.58**	-.47**	-.47**	.69**	.14	.72**
Attitude to Teachers	-.11	-.33	-.27	-.37*	-.22	-.22	-.13	.30	.30	.40*
Sensation Seeking	-.16	-.69**	-.28	-.25	-.29	-.67**	-.23	.25	-.03	.56**
Atypicality	-.33	-.43**	-.15	-.29	-.27	-.22	-.07	.34*	-.07	.53**
Locus of Control	.03	-.08	.10	.01	-.09	.04	-.03	.18	.36*	.10
Somatization	-.25	-.32	-.20	-.18	-.32	-.06	.01	.43**	.05	.56**
Social Stress	-.13	-.01	.02	.03	-.12	.16	-.19	.16	.10	.10
Anxiety	.07	.16	.08	-.21	-.05	.32	.09	.27	.44**	.03
Depression	-.43**	-.33	-.32	-.16	-.46**	-.18	-.34*	.36*	-.06	.44**
Sense of Inadequacy	-.20	-.22	-.16	-.13	-.31	-.07	-.20	.38*	.07	.29
Relations with Parents	.09	-.05	-.03	.00	.03	-.20	.07	-.18	-.37*	-.32
Interpersonal Relations	-.13	-.17	-.10	.01	.08	-.05	.12	.08	-.05	.24
Self-Esteem	-.01	.19	.12	.14	.15	.02	-.07	-.18	-.37*	-.32
Self-Reliance	.46**	.47**	.43**	.22	.42*	.17	.18	-.34*	.16	-.45**
School Maladjustment	-.37*	-.76**	-.48**	-.50**	-.50**	-.61**	-.36*	.56**	.16	.75**
Clinical Maladjustment	-.21	-.19	-.05	-.18	-.22	.05	-.05	.36*	.20	.36*
Personal Adjustment	.13	.16	.25	.15	.26	-.02	.10	-.17	-.13	-.16
Emotional Symptoms Index	-.14	-.06	-.12	-.14	-.24	.11	-.14	.27	.24	.18

Note. *p<.05. **p<.01. Stroud & Reynolds (2006).

scales (i.e., STUDY, NOTE, READ, and TEST) and negatively correlated with Student Liabilities subscales (i.e., LOMOT and CONDIF). Table 32 reports all correlation coefficients.

Relations with Measures of Academic Competence

To assess the relationship of SMALSI Form T scale scores to academic success in the classroom setting, Texas Assessment of Knowledge and Skills (TAKS) scores were obtained from the records of 53 children. Table 33 reports the Pearson r correlations between the SMALSI Form T scale scores and the TAKS scores for Reading, Math, and Science. Correlations between the SMALSI Form T scales and TAKS Reading and Math scales ranged from .03 to .32. For the SMALSI Form T, the TEST (r = .30, p < .05), TANX (r = -.32, p <.05), and LOMOT (r = -.30, p <.05) scales demonstrated significant relations with actual academic mastery of reading processes. The correlations between the SMALSI scale scores and scores on the TAKS Science and Social Studies scores indicated significant negative correlations with the TANX scale (r = -.27, p <.05; r = -.47, p <.01 respectively). LOMOT (r = -.33, p <.05) also was negatively correlated with Social Studies TAKS scores.

Table 33
Correlations of TAKS scores with SMALSI Form T Scales

	TAKS Raw Scores			
SMALSI Scale	Reading	Math	Social Studies	Science
Student Strengths				
TEST	.30*	.16	.05	-.03
STUDY	.20	.04	-.05	-.03
WRITE	.25	.23	.15	.21
ORG	.22	.09	.14	.18
READ	.03	-.05	-.11	-.12
NOTE	.12	.04	.12	.10
TIME	.04	.06	.01	.13
Student Liabilities				
CONDIF	.05	.12	.03	.21
TANX	-.32*	-.20	-.47**	-.27*
LOMOT	-.30*	-.26	-.33*	-.01

Note. *p<.05. **p<.01 Stroud & Reynolds (2006).

CHAPTER V

SUMMARY

The aim of the current study was to develop an inventory of learning strategies, academic motivation, and their related constructs. The SMALSI was designed as a tool to use in assessment, intervention, and research. As a research tool, the goal of the SMALSI was to provide insight into the developmental nature of these constructs individually and their relationship to each other. As an intervention tool, the SMALSI was designed to provide meaningful information regarding specific areas to target for intervention both for classrooms as a whole and for individualized programs. As such, the current study had two primary questions: is the SMALSI a valid and reliable measure and what information can it provide about the developmental nature of the constructs measured? At issue, in particular, were the relationships between the constructs on the SMALSI and the emotional and behavioral constructs measured by the SMALSI as well as measures of academic achievement.

Results of the current study indicate promising psychometric properties of the SMALSI Form C and Form T. More specifically, internal consistencies for the final scales produced estimates consistently above .7, indicating support for the structure of the SMALSI for C and Form T scales. These findings are consistent with regard to age and grade with the exception of the SMALSI Form C WRITE scale. Younger children in the sample had the most difficulty responding reliably regarding their use of writing strategies. While this was the lowest scale in general, it should be noted that reliability on this scale tended to increase with age as would be expected from a developmental

perspective. With this exception, younger children tended to respond in the same manner as older children to SMALSI constructs. These findings are particularly important in that they support the argument that younger children are capable of reliably reporting their own attitudes and behaviors (Reynolds & Kamphaus, 1992, 2004; Reynolds & Richmond, 1983).

The reliability of the SMALSI scales was also robust across gender and across ethnicity with one exception. When ethnicity is taken into account, results are generally commensurate with the exception of the American Indian sample produced higher reliability coefficients on several scales to a small but consistent degree. This difference was present across SMALSI Form C and Form T, with the difference being somewhat larger on Form T. While this small difference does not indicate significant implications for interpretation, it does invite further study with regard to differences in response patterns for different ethnic groups. Overall, results suggest sufficient reliability for the SMALSI, indicating good confidence that the items comprising the SMALSI scales are accurate in estimating a student's standing on each construct.

Of equal importance is evidence that the SMALSI measures the constructs it purports to measure. SMALSI constructs were determined by thorough review of literature in education, psychology, and related fields. As discussed earlier, each construct has empirical support spanning several decades to support its role in fostering academic success. The content validity of the scales and items was also supported by expert review from multiple sources.

The structure of the SMALSI as measuring individual constructs falling within the two areas of student strengths and student liabilities was supported by correlations between the SMALSI scales. Results were similar across Form C and Form T, indicating the presence of both common and distinctive constructs. More specifically, scales within the student strengths scales were correlated with each other, and scales within the student liabilities were correlated.

It should be noted that, while time management skills and organizational skills were originally developed as separate scales for both versions of the SMALSI, the two scales did not demonstrate sufficient divergence from each other and internal consistency to be considered separately for children. However, this finding lends support to Zentall et al.'s (1993) conceptualization of organizational behavior which could be described in three types: idea (organization of information), object (organization of materials), and time (time management). It may be that the divergence of these constructs becomes more apparent as learners become more sophisticated in their use of different strategies and as task demands necessitate increased use of both types of strategies.

The validity of the SMALSI scales was also supported by divergence of the SMALSI scales from clinical dimensions (i.e., depression, general anxiety, etc) and convergence with academic measures (i.e., math and reading). Correlations between the SMALSI scales and measures of emotional, academic, and social adjustment indicated that School Liability scales were positively correlated with measures of clinical, personal, and school maladjustment. In like form, the Student Strengths scales had

negative associations with these scales. This pattern was evident in both Form C and Form T. Of note, academic motivation was highly correlated with both attitude to school and teachers, highlighting the importance between school motivation and the classroom environment. This is consistent with previous literature asserting the critical roles that academic environment and characteristics of the teacher play in the level of students' academic motivation (e.g., Brophy, 2004; Pajares & Urdan, 2002). Also of importance is the application that children who report increased depression evidenced poorer study strategies such as test-taking strategies and note-taking strategies, but also decreased concentration, attention skills, and academic motivation. The trend between depression and motivation in the adolescent sample was somewhat decreased, but still evident. This finding lends support to Brackney & Karabenick (1995), who asserted the need to teach learning strategies to students with psychiatric disorders. Children and adolescents who reported decreased sense of lack of control over events in their surroundings (external locus of control) also reported increased levels of test-related anxiety, further highlighting the relations of the SMALSI with social-emotional functioning. As such, the relations between the SMALSI and BASC-SRP indicate a pattern of divergence and convergence, supportive of the content of the scales.

Results examining the relationships between the SMALSI constructs and academic achievement as measured by the TAKS also provided some promising information regarding the utility of the SMALSI in the academic arena. The TAKS, which is a curriculum-based assessment designed to assess students' attainment of minimum levels of competence for each grade level, demonstrated significant correlation

with several of the SMALSI scales. More specifically, in child samples, children's use of study strategies, writing skills, and time management/organizational techniques were linked with reading abilities. Writing skills also were positively associated with math abilities, while test anxiety impaired math performance. In the adolescent group, though, a shift was noted with test anxiety playing a more prominent role, negatively impacting reading, social studies, and science academic abilities. Academic motivation also played a more significant role in the adolescent sample, particularly in the areas of reading and social studies.

Examining the validity of the measure in relation to the performance of different demographic groups on the SMALSI also produced interesting results. With regard to gender, girls consistently scored higher on both the Child and Teen forms on scales suggesting better use of note-taking and listening skills, writing and research strategies, and test-taking strategies. Differences for gender comparison of adolescents were more prevalent, with girls scoring higher on all student strengths scales. Adolescent girls also tended to report higher test anxiety. While these differences are consistent, effect sizes were all small but consistent with previous research (Reynolds & Kamphaus, 1992, 2002, and 2004).

In relation to age, the SMALSI demonstrated reliability and validity across age and grades. In the child sample, scores on the SMALSI were stable, with little deviation aside from minor score fluctuations around the mean T-score of 50. In the teen group, there was evidenced a general trend by which adolescent's study strategies increased with age and grade. This is as would be expected as individual's study strategies and

abilities tend to improve with increased practice and refinement of skills gained through exposure to the academic setting. Of note, though, was an evidenced trend of 8th grade students demonstrating decreased study and learning strategies than other teen groups. This trend invites future research and exploration in adolescent samples.

Interpretation and Use of the SMALSI

The scales measured by the SMALSI fall into two groups (Stroud & Reynolds, 2006). Student Strengths scales include: Study Strategies (STUDY), Note-taking/Listening Skills (NOTE), Reading/Comprehension Strategies (READ), Writing/Research Skills (WRITE), Test-Taking Strategies (TEST), Organizational Techniques (ORG), and Time Management (TIME) (TIME and ORG were combined in the child version (TIMEORG)). Student Liabilities include Low Academic Motivation (LOMOT), Test Anxiety (TANX), and Concentration/Attention Difficulties (CONDIF). Normalized T-scales are generated for each scale to aid in comparison of relative strengths and weaknesses across scales. For general use, scales for which a student obtains a score more than one standard deviation (SD) above (on Student Strengths scales) or more than one standard deviation below (on Student Liabilities scales) an average score of 50. When using the SMALSI to make diagnostic decisions, however, one would likely use a more conservative level of significance, such as 1.5 SD (Stroud & Reynolds, 2006). Composite scores were not used because the diversity of the constructs did not lend itself to meaningful groups of scales.

Each scale on the SMALSI offers much in terms of insight regarding the skills and attitudes an individual child brings into the academic environment. As discussed

previously, constructs for the SMALSI were chosen for their empirically proven effectiveness in increasing academic motivation as well as the existence of empirically supported methods for teaching such skills. Interpretations of scale scores will be discussed briefly here. Complete interpretive guides for each scale are included in Appendix B.

Student Strengths

Study Skills (STUDY). Research indicates that students perform better academically when they are taught strategies for studying and learning (e.g., Alexander & Murphy, 1999; Paris & Winegrad, 1990). Rehearsal, elaboration, and organizational strategies are essential for acquiring and using information in a meaningful way (e.g., Weinstein & Hume, 1998). Students who obtain a high T-score on the STUDY scale regularly follow a plan for studying. They regularly associate new concepts with prior knowledge, employ effective memory strategies, and apply specific strategies according to the task at hand. Low scores on this scale suggest haphazard or no planning when studying and poor attainment or use of effective rehearsal strategies (Stroud & Reynolds, 2006). Teachers may incorporate study strategies into their curricula for any and all subjects. Encouraging use of such strategies in different subjects will allow for greater generalizability and flexibility in strategy use. Essential strategies to include would be those that allow a student to organize material and memory aids (e.g., Weinstein & Hume, 1998).

Test-Taking Strategies (TEST). Instruction in test-taking strategies can be helpful for all students, particularly special populations and minority students (Hughes, 1993;

Scruggs & Mastropieri, 1986, Scruggs & Tolfa, 1985). Strategies include: time-using strategies (i.e., monitoring time, answering questions you know), error avoidance strategies (i.e., accurately reading and understanding directions, methodically selecting answers), guessing strategies, and deductive reasoning strategies (i.e., eliminating unlikely answers, recognizing similar responses), intent consideration strategies and cue using strategies (Millman et al., 1965; Mastropieri & Scruggs, 1992). High scores on the TEST scale suggest a student can use effective strategies during tests, adapt strategies to different kinds of tests, analyze the intent of questions, and note the key elements of instructions. A low score indicates that these skills are lacking or not used regularly. Students who have a low score on this scale likely do not perform to their capabilities on tests. Their grades may underrepresent their understanding of the material covered (Stroud & Reynolds, 2006). Research suggests that interventions teaching test-taking strategies are most successful when they are longer in duration and implemented beginning with older elementary school children.

Note-taking/Listening Skills (NOTE). Note-takers can differ in their ability to take effective notes, relate new information to that already learned, make note-taking an active process, and determine priorities of relevant information (Faber et al., 2000). Students who have a high score on NOTE regularly review and systematically organize their notes. They are able to listen and discern important from unimportant information. Low scores indicate that a student has much difficulty deciding what notes to take and has difficulty listening to lectures (Stroud & Reynolds, 2006). Students with learning disabilities are particularly susceptible to poor skills in this area (Suritsky, 1992).

Instruction in listening strategies should include teaching students how to become aware of their listening ability, understand common barriers to listening, and listen to directions and discriminate information (Micallef, 1984, as cited in Spiegal, 1990). Note-taking instruction has been beneficial to high and low achieving students when they are how to incorporate a more active encoding process (Faber et al., 2000). This can be accomplished by teaching students (a) how to apply prior knowledge to the current subject matter, (b) how to detect and write main ideas, and (c) how to monitor themselves for understanding (Faber et al., 2000). Teachers may also affect the quality of their students notes by altering the pace and style of lectures; faster pace and disorganized presentations are associated with poor note quality (Van Meter, Yokoi, and Pressley, 1994).

Reading/Comprehension Strategies. Reading comprehension is an active, self-regulatory process that involves comprehension monitoring and comprehension regulation (Baker & Brown, 1984). The READ scale "assesses the student's ability to develop and apply an array of strategies that are known to improve comprehension and recall for reading materials" (Stroud & Reynolds, 2006, p. 8). High scores indicate consistent application of strategies for comprehension, flexibility in strategy use depending on the nature of the material, relating new material to previously learned material. These students monitor their understanding of material and adjust their attention to task and strategies used when needed. By contrast, low scorers have significant difficulty employing effective strategies for reading. They fail to adequately monitor their understanding of material and may reach the end of a passage wondering

why they do not remember what they have read. Such students may be identified as poor readers (Stroud & Reynolds, 2006). A large amount of empirical evidence exists to support the effectiveness of interventions to improve reading comprehension. Many have been discussed earlier. The reader is referred to Mastropieri and Scruggs (1997) for a summary of best practices in reading comprehension instruction, including skill training and reinforcement, text enhancement, and questioning strategies.

Writing/Research Skills (WRITE). Having students conduct research and then organize and present what they learn is one form of discovery learning, a process that tends to lead to improved comprehension and recall (e.g., see Alexander & Murphy, 1999). Writing and research skills are used in each phase of the writing process, from prewriting through drafting to final revisions. Students with high scores on the WRITE scale are excellent at using different resources at their disposal. They are able to integrate a variety of information and take care to present it in a coherent and organized manner. As such, low scores indicate a student's inability to effectively use multiple sources and integrate material. Writing is often simplistic in nature and poorly organized (Stroud & Reynolds, 2006).

Organizational Techniques (ORG). Organizational strategies are those that enable students to organize their materials. Such techniques are a building block to more complex organizational tasks as well as related constructs including time management (Richards, 1987; Slade, 1986). High scores suggest a good grasp of effective ways to organize study materials and space, including desk, home work space, and locker as applicable. These students keep track of their assignments and have a plan for carrying

them out. Low scores on the ORG scale have few skills for organizing themselves and the physical space around them. They have significant difficulty organizing their materials and often forget their homework or materials needed for class. Teachers may increase students' use of organizational techniques by incorporating various goals in their classroom. Techniques suggested include requiring the use of a three-ring binder, providing lessons and games regarding organization of their desk at school, teaching students ways to define and organize a place to study at home, providing incentives for using appropriate skills, and eliciting parent support (Gall et al., 1990). Also, the use of classroom routines is important (Stormont-Spurgin, 1997).

Time Management (TIME). The TIME scale is intended to measure activities associated with the management of various activities related to school, such as prioritizing various task demands according to importance and time requirements. High scores on the TIME scale indicate that a student is well adept at managing his or her time efficiently. Time allocated in a deliberate manner when studying or working on a project. Low scores suggest difficulty determining the amount of time that will be required for an activity and poor or a lack of organized allocation of time for different activities (Stroud & Reynolds, 2006). Teachers may easily incorporate time management skills into their academic day, including activities such as having students estimate and then monitor time requirements for activities and encouraging them to keep track of assignments and their due dates (Stormont-Spurgin, 1997). Gall et al. (1990) offer suggestions for how to incorporate skills including learning to organize a schedule, setting attainable goals and accurate timelines, deciding on priorities, arriving on time

for class or other obligations, completing work on time, providing rewards or incentives for work completion, and breaking an assignment into manageable parts into the classroom.

Concentration/Attention Difficulties (CONDIF). The CONDIF scale is intended to measure a student's skills related to attending to academic tasks, adjusting levels of attention as tasks may require them, self-monitoring attention to academic tasks, and filtering out environmental distractions. Given that attention problems may be masked by more overt behavioral or learning difficulties, it was important to include a measure specifically relating to attention. CONDIF is a Student Liabilities scale. As such, higher scores are indicative of behaviors that are detrimental to the learning process. High scores on the CONDIF scale are associated with clinically significant problems with attention and concentration in the classroom and when completing independent work at home or school. Difficulties may include daydreaming or other off-task behavior. In contrast, low scores on the CONDIF scale are indicative of a student who is able to attend well to lectures and to independent work such as homework (Stroud & Reynolds, 2006). Interventions in the classroom related to teaching effective attending include: getting attention, focusing attention, sustaining attention, reducing distractions, teaching organizational skills, increasing time management skills, and increasing specific skills in content areas (Teeter, 1998).

Low Academic Motivation (LOMOT). The LOMOT scale was designed to assess students' level of intrinsic motivation to engage and succeed in academic tasks and their tendency to adopt mastery goals for achievement. LOMOT is also a Student Liabilities

scale. Therefore high scores on LOMOT indicate a student's lack of motivation to be successful in academic pursuits. A perception that school and teachers are unfair is often evident as is a sense that academic success is not necessary for future success. Students scoring high on this scale often have an external locus of control, adding to perceptions of unfairness and helplessness. As such, low scores on LOMOT suggest that students are intrinsically motivated to succeed academically and that they control their ability to be successful (Stroud & Reynolds, 2006). Strategies shown to increase academic motivation include self-talk, goal setting, and time management (Dembo & Eaton, 1996). As the validity studies discussed here as well as others suggest, teachers also play an important role in facilitating or impeding academic motivation (Brophy, 2004). Brophy (2004) provides a theory-based integrated view of effective teaching methods and classroom management styles that facilitate intrinsic motivation and effort.

Test Anxiety (TANX). Also considered a Student Liabilities scale, high scores on the TANX indicate significant levels of anxiety during testing that have a detrimental effect on performance. Such students often have intrusive thoughts, either positive (i.e., coping statements) or negative (i.e., self-defeating remarks) during tests that impair their ability to concentrate on the task at hand. Unlike other scales, low scores on TANX also have a potential for negative outcomes. Students with less than average feelings of anxiety during tests may be expressing a lack of concern or a false sense of security regarding test performance. Such factors may also have a negative impact on test performance (Stroud & Reynolds, 2006). Test anxiety may be reduced by controlling environmental factors such as reducing stringent constraints and competitive

environments. Interventions that have typically demonstrated success are usually multicomponent approaches which include such techniques as cognitive restructuring, relaxation, time management, attention control, test-taking skills, rational emotive therapy, and study-skills training (Cavallar & Meyers, 1986; Decker, 1987).

Implications

Results of this study offer a great deal of support for the utility of the SMALSI. While the measure will inevitably lead to new possibilities in research, the most exciting aspect of the SMALSI is certainly the wealth of information it will provide for professionals working directly with children. The SMALSI was intentionally designed for use by a wide variety of individuals in a number of different settings. For example, teachers may use this measure in a group format with his class to identify trends in academic motivation or to identify specific problem areas such as ineffective note-taking or poorly developed writing skills for the class as a whole that might be incorporated into the teacher's curriculum. School level teams designed to help implement interventions prior to referral for Special Education services may use the SMALSI with a struggling child to identify specific areas that may be impeding academic performance. They may then be able to provide the necessary intervention without the need for additional levels of academic support.

Educational diagnosticians and school psychologists can use the SMALSI in a more diagnostic manner depending upon their level of training. An educational diagnostician may use results of the SMALSI in addition to their intellectual and achievement batteries to target specific areas of weakness for intervention. Children who

qualify for Special Education services often require assistance outside of the general education classroom. It is important to maximize the effectiveness of the interventions chosen in order to minimize the level of assistance needed. Information from the SMALSI can be used by diagnosticians to make meaningful academic recommendations regarding interventions to use and classroom accommodations to make in the Individualized Education Plan (IEP). Without such information, much of this process can often be the product of trial and error rather than the result of objective assessment. Students who are struggling academically, but do not meet eligibility criteria under the Individuals with Disabilities Education Act or Section 504 equal access services, are particularly vulnerable to academic failure. Teachers will need specific recommendations about what areas to target given the constraints general education modifications (i.e., tutoring, reading programs, skill-building programs).

Psychologists can use the SMALSI as part of a comprehensive assessment battery. The valuable relationships among constructs measured by the SMALSI and more global behavioral and emotional difficulties have been demonstrated in this study. Results of the SMALSI can add valuable insight into possible academic causes, consequences, or correlates for emotional and behavioral disorders.

Given the increased use of high-stakes testing emerging across the United States used in determining grade promotion, and school funding, the SMALSI also holds value more directly in the classroom setting. As states transition to requiring passing scores on state tests such as the TAAS in Texas and the FCAT (Florida Comprehensive Assessment Test) to determine school funding and pupil progress, teachers and school

personnel are faced with the increasing demands of promoting children and adolescents' academic knowledge, but also their test-taking abilities. The use of the SMALSI can be a valuable tool for teachers to help identify children's individual strengths and weaknesses in these areas to help tailor interventions to their needed area. This measure provides a user-friendly method for teachers and administrators to assess multiple children's skills at one time, without the need for comprehensive one-on-one testing.

It should be noted that, too often in an attempt to find out "what is wrong" with a child, clinicians find only that—a child's weaknesses. While this information is a necessary component to assessment, it cannot be understated the value and importance of identifying what strengths a child possesses. The SMALSI has been designed with the intent to do both by providing both positive and negative indicators and by offering objective assessment in areas that previously have been difficult to assess.

Limitations and Areas for Future Research

The development of the SMALSI opens the door to many different areas of research that were beyond the scope of this initial project. One limitation of the current validation studies was the restricted range of the academic measure used. While the TAKS offered assessment across all grade levels with a diverse population, for reasons discussed previously, it did not provide as much information as norm-referenced measures of academic achievement would in terms of the relationship of achievement to the SMALSI constructs. As such, the magnitude of correlations between the measures may have been restricted as a function of decreased variance of scores. Therefore, future

research should examine the relations between the SMALSI scales and norm-referenced academic measures.

Given the cognitive nature of learning strategies, examining the relationship of the SMALSI constructs to intellectual ability is another area to be explored. Learning strategies are considered to be a subset of cognitive strategies specifically related to learning academic material. Using the SMALSI in conjunction with intellectual measures as well as measures of executive functioning may yield additional information about a child's problems-solving and planning abilities.

Compelling correlations were obtained among SMALSI constructs and constructs of emotional and behavioral functioning in this study. In particular, the relationship between depression and the utilization of more effortful strategies offers a glimpse into the importance of using the measure as part of a comprehensive psychological assessment of children when academic performance is a concern. The current sample was non-referred children, mostly all in regular education classrooms. Differential findings may result when the SMALSI is explored in sample of students with general or specific emotional, behavioral, or learning disabilities. As such, future research exploring the use of the SMALSI with different clinical and educational populations (e.g., Learning Disabled, Depression, and Anxiety Disorder) may also provide valuable insight.

While differences among various demographic groups did not necessitate separate norms, several consistent differences were obtained. These differences in demographic variables should also be further examined in future research.

Of course, the ultimate goal of the SMALSI is to aid in intervention, allowing meaningful recommendations to be made that help foster academic success. The need for increased focus on efficient and effective learning strategies cannot be overstated. Increasing accountability puts incredible time demands on the classroom, yet without introducing and encouraging the use of effective learning strategies, academic achievement will ultimately suffer. The SMALSI may not only be used to target specific areas for improvement, it can then be used to measure the effectiveness of the intervention. Previously, such success or failure has typically been measured by informal measures with a narrow focus limited to situational aspects. Now, the effectiveness of a multifaceted intervention may be assessed with one measure. It is hoped that the SMALSI has opened many doors of possibility for application.

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APPENDIX A

Parent or Guardian Informed Consent

I am being asked to let my child participate in a study being done by Kathy Stroud, a doctoral student at Texas A&M University, on the use of the School Motivation and Learning Strategies Inventory (SMALSI). My child is one of about 2400 children who will be participating in this study. If I agree, my child will fill out some paper and pencil surveys about learning and study habits and motivation toward schoolwork and achievement. In addition to the SMALSI my child will complete some questions on a personality measure called the Behavior Assessment for Children (BASC) about behaviors at school and at home, and personality variables related to school performance such as anxiety and attitudes about school. The BASC also includes questions about other psychological symptoms such as depression, and potentially pathological thought processes which may affect student achievement as well. This all will take about 60 minutes and will happen during class time. If I do not want my child to participate, or if my child chooses not to participate, he or she will do other class work or study while the other students participate.

If I give my permission for my child to be in the study, the school or my child's teacher will give a copy of my child's most recent scores from standardized tests to Mrs. Stroud. My child will seal his or her surveys in an envelope so only Ms. Stroud will be able to see them. Once Ms. Stroud gets the standardized test scores from the school, she will put a code number on them and then remove my child's name before she looks them. Also, she will remove the cover sheet on the surveys that has my child's name on it as soon as she receives them and puts a code number on them before she looks at them. She will not look at my child's answers before she does this. This way she will have no way of knowing whose survey she is looking at so my child's answers cannot be linked in any way to him or her. I understand that all results will be confidential and not reported in a way that would identify my child individually. Neither I nor my child's teachers will be given my child's individual answers.

I understand that there are no foreseeable risks or discomfort to my child if he or she participates in this study beyond the occasional uncomfortableness some people experience when answering questions about how they think and about how they feel. I understand that we are not being paid for doing this study.

I understand that my child's participation in this study is voluntary. This means that he or she can skip any questions that he or she doesn't feel like answering, or can quit the study at any time. Being in this study, or deciding not to participate at all will make no difference in my child's grades.

I understand that this research study has been reviewed and approved by the Institutional Review Board - Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, the Institutional Review Board may be contacted through Dr. Michael W. Buckley, IRB Coordinator, Office of the Vice President for Research at (979) 845-8585 (mwbuckley@tamu.edu).

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to let my child participate in this study. I have been given a copy of this form to keep.

Please check if you agree to allow either or both of the following:

1. _____ I agree to allow my child to complete the SMALSI and give my permission for Mrs. Stroud to obtain his/her most recent standardized test scores.

2. _____I also agree to allow my child to complete the BASC self-report that was explained above.

Child's name (Please Print): _____

_____ _____
Parent/Guardian's Signature Date

_____ _____
Investigator Signature Date

If I have any other questions about this study I can contact:

Kathy Chatham Stroud (Principal Investigator)	Dr. Cecil Reynolds (Faculty Advisor)
(972) 395-7946	(979) 845-1884 or (512) 321-4320.

Student Assent

Dear student,

We are asking your help to help us find out how students learn and what helps to motivate them in school. With yours and your parents' permission, we would like you to answer some questions telling us things like how you learn, what you think about school, and how you manage your time. We may also ask you questions about how you think and feel about yourself and about school and teachers in general—not any specific person. You can choose to take part in this study or not to take part. The choice is yours, and it will not affect your grade in this class. You may also choose to stop participating in this study at any time. Please read and sign below if you agree to participate.

Thank you,

Kathy Stroud, PhD Candidate
Texas A&M University
(972) 395-7945

Cecil Reynolds, PhD, ABPP, ABPN
Texas A&M University
(979) 845-1884

Development of the School Motivation and Learning Strategies Inventory

By signing below, I agree to participate in this study. I understand that I may choose to take part in this study or not to take part in it. If I choose not to participate, my grade in this class will not be affected. I understand that I will be asked to answer questions including how I learn, how I feel about school, what I do to prepare for tests, and how I feel when taking tests. I may also be asked more general questions about how I act or feel at school and at home. I understand that my answers will be kept confidential. My name will not be associated with my answers. There are no risks or benefits for me for taking part in this study.

Sign your name here to participate:

_____ _____
Child's signature Today's Date

_____
Investigator's Signature

APPENDIX B

Interpretive Guides for Scales

Study Strategies (STUDY) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Always has a plan for studying, associates new knowledge with prior learning, rehearses often, recognizes importance of material, tailors strategies to specific needs of the task
61 – 70	Very well developed	Usually has a plan, rehearses learned material, makes material interesting to self, not afraid to seek help with difficult material
40 – 60	Average in development	Sometimes plans well for studying, some rehearsal, looks for important material
30 – 39	Below average in development	Seldom has a plan, fails to develop effective strategies, concerned more about types of test questions than about content
29 and lower	Inadequately developed	Rarely has a plan, no or ineffective strategies used, cannot differentiate important from peripheral content, haphazard studying

Note. Adapted from Stroud & Reynolds (2006).

Test-Taking Strategies (TEST) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Excellent in developing/applying strategies for taking tests, analyzes questions, uses logic
61 – 70	Very well developed	Very good at developing/applying strategies for taking tests, analyzes questions, uses logic
40 – 60	Average in development	Average at developing/using test-taking strategies
30 – 39	Below average in development	Seldom applies strategies to test taking or uses anecdotal strategies that are ineffective, fails to seek clues in item stems or to perceive key points in instructions
29 and lower	Inadequately developed	Almost never applies strategies to test taking or applies haphazard and ineffective strategies, may engage in superstitious behavior to answer questions, fails to seek clues in items or to perceive key points in directions

Note. Adapted from Stroud & Reynolds (2006).

Note-taking/Listening Skills (NOTE) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Organizes notes, often reviews and uses outlines, makes associations to old material, is an excellent listener and distiller of information
61 – 70	Very well developed	Plans note-taking and tends to develop strategies, is a good listener and usually identifies salient points in lecture
40 – 60	Average in development	Takes notes and listens at an average level, usually thorough but without a specific plan
30 – 39	Below average in development	Poorly organized at drafting notes, sketchy; poor at outlining with difficulty distilling most important details
29 and lower	Inadequately developed	Severe problems with knowing what notes to take, typically writes down too little, does not listen well to lectures, almost never uses advance organizers or associated strategies

Note. Adapted from Stroud & Reynolds (2006).).

Reading/Comprehension Strategies (READ) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Excellent at applying systematic strategies to understand written material, applies rehearsal and other advance strategies while reading, makes mental or physical notes, monitors comprehension and adjusts strategies depending on the task
61 – 70	Very well developed	Very good at applying strategies to enhance comprehension, seeks help when needed, previews and reviews material
40 – 60	Average in development	Average at developing and applying strategies for comprehension, sometimes uses advance organizer or other advanced techniques but not consistently
30 – 39	Below average in development	Seldom applies strategies to reading, seldom uses note taking or rehearsal while reading, has problems discerning key points
29 and lower	Inadequately developed	Almost never invokes a strategy when reading, drifts across material, cannot tell key points from filler, fails to use associative strategies, often has reading problems generally

Note. Adapted from Stroud & Reynolds (2006).).

Writing/Research Skills (WRITE) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Excellent use of search and reference materials, takes pride in writing and in use of multiple sources, strength in organizing information
61 – 70	Very well developed	Good use of search and reference materials, often has a strategy for writing and organizing a paper
40 – 60	Average in development	Average use of search and reference materials, knows how to use reference materials, sometimes uses outlines or other advanced organizers
30 – 39	Below average in development	Poor use of search and reference materials, difficulties knowing how to use them, seldom employs outlines or other advanced organizers, writes in linear style
29 and lower	Inadequately developed	Severe problems in use of search and reference materials, may not know how to use them effectively even when tries, poorly organized writing, unsystematic efforts and simplistic constructions common

Note. Adapted from Stroud & Reynolds (2006).).

Organizational Techniques (ORG) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Excellent skills at organizing study materials, also organizes and manages study space well, keeps track of materials well
61 – 70	Very well developed	Very good at organizing study materials, also organizes and manages study space well, keeps track of materials used
40 – 60	Average in development	Average skills at organizing and managing study materials, notes, and study space, and tracking materials
30 – 39	Below average in development	Few skil1s at organizing study materials and physical space for study, occasionally misplaces or loses assignments, notes, and other study aids
29 and lower	Inadequately developed	Extremely poorly developed skills at organizing study materials and physical space for study, frequently loses or misplaces notes, forgets homework assignments or materials, tends to be disorganized generally

Note. Adapted from Stroud & Reynolds (2006).).

Time Management (TIME) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely well developed	Excellent at managing and allocating time when studying, planfu1 in approaching new learning
61 – 70	Very well developed	Very good at managing and allocating time when studying, planful in approaching new learning
40 – 60	Average in development	Average skills at managing and allocating time, has schedules and uses them but not consistently, planful but not always consistently so
30 – 39	Below average in development	Does not manage or allocate time for studying very well, occasionally planful with study habits but does not partition or use time well especially across multiple subjects
29 and lower	Inadequately developed	Gives little thought to or has severely limited skills for managing time for new learning, study, or review; rarely plans out study activities, haphazard approach to time allocation dominates

Note. Adapted from Stroud & Reynolds (2006).).

Concentration/Attention Difficulties (CONDIF) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely problematic	Substantial problems with attention and concentration related to classroom and other academic pursuits, frequent daydreaming, off-task behavior, frequently misses interactions and key lecture points
61 – 70	Moderately problematic	Significant difficulty sitting and attending to classroom work, easily bored in a structured setting, occasional daydreaming and other internal distractions present
40 – 60	No more problematic than for most students	Average listening and attention skills in the classroom
30 – 39	Less problematic than for most students	Above-average listening and attention skills in the classroom environment
29 and lower	Minimally problematic	Excellent listening and attention skills in the classroom environment

Note. Adapted from Stroud & Reynolds (2006).).

Low Academic Motivation (LOMOT) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Extremely problematic	Little if any motivation to succeed in school, strong need for external reinforcement, most have external locus of control, frequent feelings that school and teachers are unfair and likely unimportant to his or her future
61 – 70	Moderately problematic	Below-average motivation to succeed academically, low need for achievement, feels school may be unimportant and teachers may be unfair, tendency toward external locus of control evident
40 – 60	No more problematic than for most students	Average motivation to succeed academically
30 – 39	Less problematic than for most students	Above average
29 and lower	Minimally problematic	Strongly motivated with keen desire to succeed academically, internal locus of control evident

Note. Adapted from Stroud & Reynolds (2006).).

Test Anxiety (TANX) Scale Interpretive Guide

T-score range	Qualitative Descriptor	Potential Interpretation
71 and higher	Clinically significant	Severe anxiety present when confronted with tests, unable to demonstrate learning in a structured setting, experiences intrusive thoughts including coping statements
61 – 70	Significantly above average	Significant anxiety present for testing activities, lowered levels of performance common but not severely debilitating
40 – 60	Average	Experiences average, common performance anxiety associated with testing and related structured evaluation procedures
30 – 39	Significantly below average	Comfortable with most testing circumstances especially if well prepared, few worries over performance
29 and lower	Extremely below average	May be overly comfortable or even unconcerned about testing and demonstrating what has been learned, nonchalant about tests, may test poorly due to lack of concern

Note. Adapted from Stroud & Reynolds (2006).).

VITA

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B.S. Mississippi State University
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M.S. University of Louisiana at Monroe
Monroe, LA
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Ph.D. Texas A&M University
College Station, TX
(School Psychology, 2006)

PROFESSIONAL EXPERIENCE:

Intern
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Department of Psychiatry
University of Minnesota Medical School
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PUBLICATIONS:

Stroud, K.C. & Reynolds, C.R., (2006). *School Motivation and Learning Strategies Inventory*. Los Angeles: Western Psychological Services.