ACHIEVEMENT EFFECTS OF SUSTAINED SILENT READING

IN A MIDDLE SCHOOL

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Achievement Effects of Sustained Silent Reading

in a Middle School

by Mary Pinson Sullivan

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Abstract

Mary Pinson Sullivan. ACHIEVEMENT EFFECTS OF SUSTAINED SILENT
READING IN A MIDDLE SCHOOL. (Under the direction of Dr. Carol A. Mowen)
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The purpose of this study was to determine the reading achievement effects of a school-
year-long program of sustained silent reading in a middle school. Students' scores on the
Stanford Achievement Test, Ninth Edition across three years (2006, 2007, and 2008)
were analyzed to test eleven null hypotheses. A 3 x 3 repeated measures factorial
ANOVA showed significant post treatment differences in gains for Total Reading and
Reading Comprehension at each of the three grade levels (sixth, seventh, and eighth
grades) and for Reading Vocabulary for seventh grade. Pretreatment gains were greater
for Reading Vocabulary in sixth and eighth grades. A 3 x 3 x 2 repeated measures mixed
factorial ANOVA showed that no significant differences existed between the gains of
higher (at or above the 60th percentile) and lower (at or below the 40th percentile)
performing students following the treatment. Through interviews, teachers reported the
presence of up to eight traits of successful sustained silent reading programs. Results of a
univariate ANOVA indicated that student achievement was higher in classrooms
characterized by six or more of the traits.

Key Words: sustained silent reading, middle school, reading achievement,
repeated measures ANOVA, stacked for success traits

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To the Administration, faculty and staff of BCCS: Thank you for allowing me to conduct this study and for participating in it.

Dedication

In loving memory of my mother, Pat Pinson, whose belief in the value of education inspired me to continue mine. Her vision for better education and her efforts to establish a charter school encouraged me to return to the classroom and to better prepare myself for the challenges through higher education.

To my husband Jamie and children Sara and William: I couldn't have done this without your unwavering support and your willingness to cook your own dinner many nights and weekends so that I could do school work. Thank you for allowing me to accomplish something that once was only a dream.

To Daddy: I am thankful for your love and for the Christian example you are. I appreciate the sacrifices you made through the years to ensure I had the best education available. Thank you, too, for reading this paper and helping me to clarify my thinking.

To the rest of my family, my three brothers, my three sisters-in-law, my seven nieces and nephews, James and Sandra: You've listened when I've needed an ear, and you've encouraged me to get the job done. Here it is. Thank you.

To my colleague Linda: Thank you for cheering me on and for being a sounding board for great ideas, perplexing thoughts, and possible ventures.

I love you all.

"For I know the plans I have for you," declares the Lord, "plans to prosper you and not to harm you, plans to give you hope and a future." Jeremiah 29:11

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Chapter One: Introduction to the Study

In an effort to improve the quality of education in the state, the Georgia

Department of Education implemented the Georgia Performance Standards with one

standard being that students are expected to read twenty-five grade-level appropriate

books or the equivalent of one million words each school year (Georgia, 2006). An

introduction to the Standards reminds educators that students should read across the

curriculum, encountering both fictional and informational texts of their own choosing in

areas of personal interest (Georgia, 2006).

Because many students lack the self-discipline, desire, or opportunity to read

outside of school, educators must acknowledge the importance of providing an

opportunity during the instructional day for students to work toward the state standard

and to build intrinsic motivation for personal and recreational reading. Expecting

students to read is not sufficient; educators must provide opportunities for students to

engage in pleasurable reading. By providing an established time and an environment

conducive to reading, educators place priority on this skill, which in turn can lead

students to value reading as a habit. Furthermore, educators can expect that student

achievement in reading will increase as a result of engaging in this additional amount of

reading.

The generally accepted academic benefits of reading are many: comprehension

improves, vocabulary broadens, writing style develops, and background knowledge

forms. Atwell (2007) noted,

One of the many virtues of frequent, voluminous reading is how it fills up the file

drawers of long-term memory, increases our vicarious experience, and improves

our comprehension of the world and the word. The more we read, the more that

has the possibility of making sense to us, and the better we understand what we

read. (p. 60)

With the Georgia Performance Standards for reading as evidence, the staff of the Georgia

Department of Education acknowledges the benefits of a significant amount of reading

and expects Georgia students to read widely.

Statement of the Problem

Following a one school-year implementation of twenty minutes of daily sustained

silent reading (SSR), the staff of a middle school desired to determine if the investment of

time during the school day significantly increased student reading achievement on the

Stanford Achievement Test, Ninth Edition. According to the report of the National

Reading Panel (2000), the lack of empirical evidence to support the instructional practice

of SSR necessitated more studies. For SSR to be embraced as a research-based practice,

researchers must conduct studies which are replicable and which provide empirical

evidence of the effectiveness of SSR (Klump, 2007).

Research Questions

This study sought empirical evidence to answer the following research questions:

1. Does a program of sustained silent reading contribute to higher reading
   achievement scores in the middle grades?

2. Do lower performing students exhibit different gains in reading achievement
   than higher performing students when sustained silent reading is
   implemented?

3. Is student achievement in reading affected by the presence of the eight *stacked for success* traits during sustained silent reading programs?

Null Hypotheses

The present study proposed the following null hypotheses:

$H_0 1_1$ Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for sixth graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

$H_0 1_2$ Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

$H_0 1_3$ Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for eighth graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

$H_0 1_4$ Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for sixth graders on the vocabulary subtest of the SAT-9 will show no difference when compared to the mean gain scores of the vocabulary subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_5 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the vocabulary subtest of the SAT-9 will show no difference when compared to the mean gain scores of the vocabulary subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_6 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for eighth graders on the vocabulary subtest of the SAT-9 will show no difference when compared to the mean gain scores of the vocabulary subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_7 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for sixth graders on the comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_8 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the comprehension subtest of the SAT-9 will show no difference when

compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_9 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for eighth graders on the comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

H_02 The post-test mean gain scores of middle school students whose pretest score on the reading section of the SAT-9 was at or below the 40th percentile and middle school students whose pretest score was at or above the 60th percentile will show no difference.

H_03 Post-test mean scores for Total Reading on the SAT-9 of middle school students who participated in sustained silent reading in a classroom characterized by six or more of the *stacked for success* traits will show no difference when compared to post-test mean scores of middle school students whose classrooms were characterized by fewer than six traits.

Definitions

Sustained Silent Reading (SSR) - This term refers to a quiet period of time during the instructional day in which students are given the opportunity to read without interruption. In some schools this period of time may be referred to by other acronyms, such as DEAR (Drop Everything and Read).

Stacked for Success Traits - These eight factors are characteristics of successful SSR

programs: access to books, appealing choices, conducive environment,

encouragement, staff training, non-accountability, follow-up activities, and

distributed time to read (Pilgreen, 2000, p. 6).

Stanford Achievement Test, Ninth Edition (SAT-9) - This term refers to the test which was

used as the measure of reading achievement in this study.

National Reading Panel (NRP) – This was the group tasked by the federal government

with analyzing studies to determine scientifically research-based instructional

strategies and programs for the teaching of reading.

Summary

Though some research does exist to support SSR as an effective use of

instructional time, better-designed experiments to measure academic achievement in

reading are needed if SSR is to become accepted as a research-based instructional

practice. Further studies are needed to add to the empirical evidence to support or refute

SSR as an effective use of instructional time during the school day.

Results of this study may answer the call for long-term studies of sustained silent

reading as an instructional practice for middle school students. According to the report of

the National Reading Panel (2000), the lack of empirical evidence supporting the

instructional practice of SSR necessitates studies which are replicable and provide

empirical evidence of the effectiveness, or lack thereof, of the practice.

Not only will this study add to the research base and provide professional

knowledge on this instructional strategy, but the results of this study also may have more

immediate effects at the school where the research was conducted. Having quantitative

evidence of the effects of SSR on student achievement scores on the reading section of the SAT-9 is important to the school administrators as they make improvement plans for the future. Determining whether the time allotted during the school day contributed to gains in reading scores for all or any students may ultimately determine if the time continues to be used for this purpose.

Logical conclusions about the program indicate that any amount of time students spend reading is a good use of time. Though some students and teachers may indicate their pleasure with the program, others may dislike it. Convincing unenthusiastic teachers of the benefits of the program is essential if the program is to continue. Training teachers to incorporate the eight factors of effective SSR programs may be an important step toward strengthening the program. Evidence of improved student achievement may convince teachers and administrators of the effectiveness of this use of school time.

Organization of the Study

This paper began with an examination of the problem and a rationale for the study of SSR in a middle school. Chapter Two contains a discussion of the theoretical and historical perspectives surrounding SSR, followed by a review of the literature regarding students' reading habits and attitudes, the achievement effects of SSR, and the characteristics of effective SSR programs. In Chapter Three the methodology for gathering and analyzing the data is explained. The results of the study will be provided in Chapter Four. A discussion of the results and implications of the research will be the focus of Chapter Five.

Chapter Two: Review of the Literature

Sustained silent reading (SSR) has been the subject of numerous studies; however, the National Reading Panel (2000) report failed to recommend this strategy due to the lack of empirical evidence of its effectiveness in increasing student achievement (Klump, 2007; Krashen, 2006). Though research on various implementations of silent reading programs exists, the National Reading Panel suggested additional scientific research needs to be conducted to determine the benefits of such a program (Klump, 2007).

This chapter begins with a discussion of the theoretical framework for SSR, followed by a glimpse into the historical background of SSR programs. Next, a review of the literature ensues, with topics including habits and attitudes concerning reading, achievement effects of SSR, and characteristics of successful SSR implementations.

Theoretical Framework

Two theories, social cognitive theory and engagement theory, combine to provide the framework for a successful SSR program. The use of multiple theories was explained by Tracey and Morrow (2006): "Authors who believe in the importance of multiple lenses assert that each theory makes a unique and valuable contribution to understanding the phenomena under examination" (p. 11). With its multiple characteristics, SSR is grounded in both social cognitive theory and engagement theory.

Social cognitive theory. Albert Bandura's social cognitive theory, previously termed social learning theory (Bandura, 1977), provides the framework for both the teacher modeling of the enjoyment of reading and the motivational aspects students need

to become lifelong readers. Observational learning, resulting from teacher modeling, and intrinsic motivation contribute to effective SSR programs.
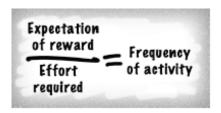
As Tracey and Morrow (2006) noted, SSR is "grounded in observational learning" (p. 113). When teachers read for pleasure in the presence of students, they model the desired behavior of a lifelong reading habit. According to Bandura (1977), "When modeling is explicitly used to develop competencies, the more talented and venturesome are apt to derive the greater benefits from observation of exemplary models" (p. 89). This idea carries important implications for an effective implementation of SSR, especially in the upper elementary, middle, and high school classrooms where students are typically capable of engaging in sustained periods of independent reading. SSR should not be considered a method for teaching students to read, but rather a method for having students practice the reading skills they have acquired.

When students observe teachers enjoying reading, they are more likely to also engage in pleasure reading. Bandura (1977) wrote, "As a result of repeated exposure, modeling stimuli eventually produce enduring, retrievable images of modeled performances" (p. 25). The enduring nature of the modeled image of a teacher reading for pleasure may well produce positive effects on students long after the SSR program ends. Furthermore, reading advocate Jim Trelease (2007) said, "It's near impossible to catch the love of reading from someone who doesn't have it themselves" (para. 5). Modeling this "love of reading," therefore, becomes an essential role for teachers who wish to encourage student reading.

SSR provides opportunities for students to practice the reading skills they have learned through explicit instruction, thus leading to proficiency. As students gain reading

proficiency, their confidence in their abilities increases. This, too, is grounded in social cognitive theory: "Efficacy expectations determine how much effort people will expend, and how long they will persist in the face of obstacles and aversive experiences" (Bandura, 1977, p. 80). To become hooked on reading, students need access to ability-appropriate reading materials to build their confidence.

Trelease (2007) noted the insight into reading motivation provided by Schramm's fraction of selection (Shramm, n.d.). Schramm's formula sheds additional light on the motivational constructs of Bandura (1977) and Guthrie and Alvermann (1999), constructs which are necessary to understanding students' motivation to read. Readers expect to gain something in exchange for their efforts. Intrinsic motivation can be viewed in light of this formulaic explanation:

$$\frac{\text{Expectation of reward}}{\text{Effort required}} = \text{Frequency of activity}$$

(Schramm's formula noted by Trelease, 2007).
How frequently an individual performs an activity is a result of dividing the expected rewards, such as pleasure, escape, and information gathering, by the difficulty or effort required. Difficulties could be things such as distractions, lack of a print rich environment, lack of time, learning disabilities, negative peer pressure, or noise level. The higher the reward factors and lower the effort required, the more frequently the activity will occur; likewise, the fewer the reward factors and the more effort required, the less frequently the activity will occur (Trelease, 2007).

The more skilled and automatic students become in reading, the greater the

likelihood they will read. As Bandura (1977) noted,

> Many of the activities that enhance competencies are initially tiresome and
> uninteresting. It is not until one acquires proficiency in them that they become
> rewarding. […] The best way to ensure the prerequisite learning is to support
> children's efforts until their behavior is developed to the point that it produces
> natural sustaining consequences. Thus, for example, children may initially
> require some encouragement to learn to read, but after they become proficient
> they read on their own for the enjoyment and valuable information it provides. (p.
> 104)

Bandura's theory undergirds the goal of SSR: to provide opportunities for children to
experience the pleasure of reading, with the definitive goal being to create a burgeoning
reading habit.

From the social cognitive perspective, "Motivation is primarily concerned with
how behavior is activated and maintained" (Bandura, 1977, p. 160). For example, not
only is enjoyment of reading an intrinsic reward which serves as a motivator, but also the
anticipation of future benefits resulting from sustained effort is motivational (Bandura,
1977, p. 161). In essence, people will exert effort in the present in anticipation of future
self-satisfaction. Thus, setting achievable goals and working to meet them is an aspect of
motivation:

> A [...] cognitively based source of motivation operates through the intervening
> influences of goal setting and self-regulated reinforcement. Self-motivation
> requires standards against which performance is evaluated. When individuals
> commit themselves to explicit goals, perceived negative discrepancies between

what they do and what they seek to achieve create dissatisfactions that serve as

motivational inducements for change. (Bandura, 1977, p. 161)

Positive self-evaluation, then, is dependent upon meeting the goals people establish for

themselves. To meet these goals and further promote intrinsic motivation, Bandura

(1977) suggested setting smaller, attainable goals: "Self-motivation is best maintained by

explicit proximate subgoals that are instrumental in achieving larger future ones.

Subgoals help to create present inducements for action, while subgoal attainments

provide the self-satisfactions that reinforce and sustain one's efforts along the way" (p.

162). Bandura's explanation of motivation suggested that having students set personal

reading goals may motivate them to avidly pursue those goals. In this way, students can

view themselves as successful readers, set higher goals, and more readily engage in

reading practice.

Social cognitive theory, therefore, provides theoretical support for essential

aspects of effective SSR programs. Teacher modeling and the inclusion of intrinsically

motivational characteristics are foundations for SSR.

Engagement theory. A second perspective forming the foundation for SSR is

engagement theory. Reader engagement has been the focus of much research by Guthrie

and Wigfield (1997), Guthrie and Alvermann (1999), and Guthrie (2001; 2008). From

their work, engagement theory has emerged as significant to understanding the links

between reading motivation, reading practice, and reading achievement. Guthrie (2001)

gathered support for the theory that "engagement is strongly related to reading

achievement" by citing studies in which "more highly engaged readers showed higher

achievement than less engaged readers" despite differences in age or socio-economic

status (para. 2-3).

The roots of engagement theory can be traced to the works of Dewey and Friere. Intrinsic motivation [for reading], wrote Guthrie and Alvermann (1999), "is akin to Dewey's sense of interest. An interested reader personally identifies with the conceptual content of a text so fully that absorbing its meaning is an effortless activity" (p. 19). Furthermore, Friere's notion "that literacy enables people to understand, and even change, the social order," (Guthrie & Alvermann, 1999, p. 19) links to aspects of engagement theory in that "the ultimate benefit of reading motivation is empowerment. […] Ultimately, this student has opportunities to act upon what he reads" (Guthrie, 2008, p. 12). These ideas tie directly to SSR because engaging students in reading to the extent that they read for recreation and personal purposes beyond the classroom are goals of SSR programs.

By definition, "*engaged readers* are those who are intrinsically motivated to read and who therefore read frequently" (as summarized by Tracey & Morrow, 2006, p. 64). Engagement theory provides support for the emphasis SSR places on student choice and the availability of a variety of reading materials, both of which are motivational factors. The likelihood that students will become engaged readers increases when they are allowed frequent access to classroom and school libraries to select books that interest them from among a large assortment of genres and topics (Guthrie & Wigfield, 1997; Guthrie & Alvermann, 1999; and Guthrie, 2008). For students to thrive in an SSR program, schools and teachers must provide a wide selection of reading material.

Guthrie (2008) qualified that "it is the frequency and depth of academic reading [as opposed to nonacademic reading] that associates positively and highly with measured

reading comprehension" (p. 4). Academic reading, for this purpose, encompasses multiple disciplines and genres with the "goals of gaining knowledge, using text for improving other skills such as math or historical thinking, exchanging thoughts and opinions with peers, and aesthetic enjoyment of literature or of well-formed ideas" (Guthrie, 2008, p. 4). This idea differs from nonacademic reading that typically "centers on social interactions and is likely to feed personal pursuits or popular culture" (Guthrie, 2008, p. 4). This point informs the quality of material that should be made available to students for SSR. Though reading should be pleasurable, not all forms of leisure reading necessarily contribute to greater achievement.

The importance of providing opportunities for readers to collaborate with one another also arises from the engagement perspective (Guthrie, 2001). For example, when student readers share their insights about new reading, discuss an author's viewpoint, or simply spread their excitement about a book with their classmates, their motivation for reading is reinforced. For effective SSR programs, well designed follow-up activities can provide this avenue for student expression, and thus, enhance engagement (Guthrie, 2001).

Of further significance is the following assertion: "If students exit school with low intrinsic motivation to read, they will be 'at risk' of being nonreaders who shun books. They will be nonparticipants in the literate community" (Guthrie & Alvermann, 1999, p. 27). Unfortunately, research reveals what many educators already know through firsthand experience: intrinsic motivation for reading begins to decline in the upper elementary grades and continues to erode through middle school and into high school, with more pronounced negative effects for lower achievers (Guthrie & Alvermann, 1999,

p. 26). Therefore, school administrators should address reading motivation in such a manner as to increase student interest and desire in reading for personal purposes.

At the heart of engagement is motivation. Students must be motivated to become engaged. Intrinsic motivators are desirable because they are self-generating; students engage because they want to. However, in the school setting, motivation is often extrinsic, leading to students performing tasks in compliance in exchange for some outward reward. Six intrinsic motivators for reading have been identified. These include involvement in the text; curiosity about particular topics; social interaction around text discussions; the challenge to persist even through difficult material; recognition of the importance or value of reading; and efficacy, the belief in one's ability to perform (Guthrie & Alvermann, 1999). The authors further define extrinsic motivators as recognition, competition with peers, and grades or teacher evaluations (Guthrie & Alvermann, 1999, p. 21-22). Ideally, SSR programs are endowed with characteristics that motivate students intrinsically.

Described as a *flow experience*, motivated reading occurs when students are so fully immersed in their reading that "nothing else seems to matter" (Csikszentmihalyi, 1990, as cited in Gardiner, 2005, p. 23). According to Csikszentimihalyi's flow theory, "Readers experience flow when they enjoy or are satisfied by what they are reading, and the reading experience becomes its own reward" (Guthrie & Wigfield, 1997, p. 206). In this sense, such seemingly effortless reading

is characterized by intense involvement, curiosity, and a search for understanding. When readers become completely absorbed, they are likely to continue their engagement in other contexts. For example, if students become excited about

reading in school, they are more likely to want to read at home as well. (Guthrie

& Alvermann, 1999, p. 66)

When a flow experience occurs, reading shifts from an academic task to a recreational

pursuit. Thus, providing adequate time periods in the school day for students to get into

the flow of reading is a desirable characteristic of SSR programs, as this experience has

the potential to form a foundation for a lifetime reading habit.

While motivation is an essential component of reading engagement, it is only a

fraction of the equation. Reading engagement involves "the joint functioning of

motivation, conceptual knowledge, strategies, and social interactions during literacy

activities" (Guthrie & Alvermann, 1999, p. 20). Conceptual knowledge begins with a

student's background knowledge, which is the foundation on which new learning

scaffolds. Activating prior knowledge in advance of reading new texts aids in

comprehension. Additionally, strategies aid students in understanding what they read;

the more adept students are in the use of reading strategies, the better they understand

what they read, so the greater the chance they will engage in reading (Guthrie &

Alvermann, 1999). Skilled teachers provide students with strategy instruction to aid them

in comprehending, thus highlighting the importance of staff training as a characteristic of

effective SSR programs. Finally, from a social standpoint, "classroom settings that invite

collaboration are more likely to spark interest, effort, and attention than settings in which

individuals are isolated" (Guthrie & Alvermann, 1999, p. 35). Opportunities to reflect on

one's reading and to share fresh insights are motivators. Pilgreen (2000) determined that

follow-up activities constitute one of the characteristics of successful SSR programs,

because they provide students with an avenue for collaborating with their peers about the

books they have read. According to this theory, the synchronous functioning of these processes can result in reading engagement.

Engagement theory provides a construct around which student motivation for reading can be framed. Following the view that intrinsic motivation is more desirable and produces better results than extrinsic motivators (Guthrie & Wigfield, 1997), classroom teachers can increase student engagement in reading by providing ample reading material in the classroom, allowing students to self-select their reading material, and encouraging collaboration among students in relation to their reading (Guthrie, 2001 and Guthrie, 2008). Reducing the emphasis on grades, points, and other extrinsic factors while focusing more strongly on intrinsic motivators such as choice, autonomy, meaning, social interaction, confidence, and relevance are keys to engagement (Guthrie, 2008). These aspects of intrinsic motivation also are echoed in the literature for an effective SSR program (Pilgreen, 2000; Atwell, 2007; Gallagher, 2009; Gardiner, 2005).

Historical Background

SSR is certainly not a new idea. The origins of this classroom practice can be traced to University of Vermont professor Lyman Hunt who proposed this initiative in the 1960s. This effort was followed in the 1970s by McCracken and McCracken who offered guidelines for teachers to successfully implement a program of SSR (McCracken, 1971; Gardiner, 2005; Trelease, 2006; and Pilgreen, 2000).

The original guidelines for SSR programs included providing approximately fifteen minutes daily for children to read to themselves; having students self-select reading material prior to the reading period; requiring no records, tests, or reading logs be kept; and adults modeling reading during the period (as reported in Trelease, 2006, p. 85).

These guidelines remain as important today for an effective SSR program as they were when first proposed (Pilgreen, 2000; Krashen, 2004).

Through the years, a variety of acronyms have been used in classrooms across the nation to refer to this period of uninterrupted silent reading. Among the more popular terms are SSR (Sustained Silent Reading), USSR (Uninterrupted Sustained Silent Reading), FVR (Free Voluntary Reading), SQUIRT (Sustained Quiet Reading Time) and DEAR (Drop Everything and Read). Regardless of the term used, the purpose of the reading period has remained relatively constant: "to develop each student's ability to read silently without interruption for a long period of time" (McCracken, 1971, p. 521).

In some schools, a school-wide SSR period is an accepted practice; in others, individual classroom teachers elect to offer SSR; in others, the practice is altogether forbidden. Despite admonishment from well-meaning administrators, many teachers have long acknowledged the value of offering an opportunity for SSR as part of their instructional repertoire. Addressing the distorted view that SSR is not an acceptable teaching practice, Krashen (2006) wrote, "Administrators need to know that when teachers are reading to students, and when teachers are relaxing with a good book during sustained silent reading sessions, teachers are doing their job" (p. 151). When coupled with direct instructional practices, SSR can provide the practice that students need to build their reading proficiency. Simply stated, "Reading is a skill — and the more you use it, the better you get at it" (Trelease, 2006, p. 84).

The focus on research-based instructional practices for the teaching of reading brings SSR into question in the new millennium. Though there have been numerous studies conducted on the topic of SSR, few of these received the approval of the National

Reading Panel (2000). In fact, in its findings concerning independent silent reading, the Panel reported:

> With regard to the efficacy of having students engage in independent silent reading with minimal guidance or feedback, the Panel was unable to find a positive relationship between programs and instruction that encourage large amounts of independent reading and improvements in reading achievement, including fluency. In other words, even though encouraging students to read more is intuitively appealing, there is still not sufficient research evidence obtained from studies of high methodological quality to support the idea that such efforts reliably increase how much students read or that such programs result in improved reading skills. Given the extensive use of these techniques, it is important that such research be conducted.
>
> It should be made clear that these findings do not negate the positive influence that independent silent reading may have on reading fluency, nor do the findings negate the possibility that wide independent reading significantly influences vocabulary development and reading comprehension. Rather, there are simply not sufficient data from well-designed studies capable of testing questions of causation to substantiate causal claims. The available data do suggest that independent silent reading is not an effective practice when used as the only type of reading instruction to develop fluency and other reading skills. (National Reading Panel, 2000)

The Panel neither confirmed nor denied the usefulness of SSR. The findings, however, have caused concern in some schools because of the mandate to use only research-based

practices for reading instruction in order to receive federal funding for reading programs (Krashen, 2006). The Panel did establish that SSR is not a stand-alone instructional practice to teach students to read. According to McCracken (1971), SSR is "not a total reading program" (p. 521). SSR should be "viewed as a complement of a teaching program" (McCracken, 1971, p. 521).

The Panel called for better studies to determine the instructional benefits of SSR. Long term studies that indicate causation may be quite difficult, if not entirely impossible, to measure. After all, over a lengthy period of time, more variables will compete to contribute to student learning than independent reading alone, thereby reducing the chance to determine causation. More likely, studies such as the present one evidencing greater academic growth, will be used to inform educators of the efficacy of SSR as a classroom practice.

Habits and Attitudes toward Reading

Much of the research surrounding SSR assesses students' habits and attitudes toward reading. While students' attitudes ultimately determine the priority students place on reading, these studies fail to provide a quantitative measure of reading achievement as a result of SSR practices. Though one of the reasons for initiating a program of SSR is to create lifelong readers, in this age of accountability and research-based instructional practices, survey data indicating students' pleasure reading habits is inadequate for educational policymakers. However, the value of such goals should not be minimized.

English teacher Steve Gardiner (2005), who began a program of SSR in his classroom over twenty-seven years ago, had this to say:

They've seen the magic that happens when they choose their own books, read

them at their own pace, and share the joy of reading with their peers and teacher.

Sustained silent reading is the single most important thing I have done for my

students. I can't imagine teaching without it. (p. 11)

With the goal of not only improving students' reading ability, but also creating lifelong

readers, Gardiner (2005) went further to define SSR as the "'lifetime sport' of the

academic world" and said, "I wish I could drive past the houses of former students, see

them reading, and honk" just as he saw his former cross-country team members jogging

through the neighborhood (p. 22).

A study of ninth graders engaged in a once a week SSR period revealed that

students enjoyed the reading time given them, and many increased the amount of reading

they chose to do outside of class (Kirby, 2003). Similarly, Krashen (2004) highlighted

students' reading pleasure as a result of their participation in SSR. He cited more than

ten studies concerning students' attitudes toward SSR, which revealed a preference for

in-school reading periods.

In another study, Yoon (2002) noted that self-selection positively affected

students' attitudes toward reading. Also, students' interests in what they read affected

their comprehension. Yoon (2002) indicated that having the teacher read during the

period was important because it provided a model. Not having to record notes or take

tests on the material they read added to the pleasure of reading (Yoon, 2002). Yoon's

meta-analysis reviewed the findings of seven studies concerned with attitudes toward

reading, all of which compared an experimental group to a control group. She found an

effect size of .12, suggesting that there was statistical evidence to verify the hypothesis

that SSR positively affected student attitudes toward reading (Yoon, 2002, p. 191).

Development of positive attitudes takes time and evolves slowly, so the small effect size was expected (Yoon, 2002, p. 193).

A time series study (Chua, 2008) surveyed students three times during a twelve month period of an SSR implementation in high school. The researcher found that students increased the amount of time they spent reading in school, and that they enjoyed the reading, while some students also decreased the amount of after-school reading they did (Chua, 2008). Overall, students seemed to read more with the program than they did previously.

Of the studies reviewed, the majority pointed toward a positive relationship between the amount of time spent reading and students' attitudes toward reading. These studies suggested that providing students with opportunities in school to read independently for a set period of time can help develop a positive attitude toward reading and foster lifelong reading habits (Gardiner, 2005; Kirby, 2003; Krashen, 2004; Yoon, 2002; Chua, 2008).

Scientific Research Model

Many of the research reports on SSR were not included in the National Reading Panel report because they did not fit the research standards adopted by the panel. Garan and DeVoogd (2008) wrote, "In their quest for scientific certainty, the panel chose to rely solely on a medical model, using experimental treatments and control groups, even though few education researchers adopted such a model" (p. 337). Consequently, SSR did not receive the approval of the panel as a research-based instructional practice.

In her comparison of medical and educational research, Riehl (2006) defined the medical model referred to as a randomized clinical trial (RCT). She noted that

The RCT typically comes at the end of a laborious, time-consuming, and expensive progression of research through basic experimental discovery and initial tests of efficacy to a more extensive validation of the presence of intended effects and a search for rare, unacceptable side effects. It is the cumulative knowledge gained from this extensive research, not just the results of the last, large RCT, that lends weight to a finding of effectiveness for a treatment. (Riehl, 2006, p. 25)

Riehl (2006) further added:

Given this model from medicine, education researchers ought to have similar opportunities to conduct extensive conceptual and exploratory research, in addition to small-scale treatment studies and contextual analyses, before even beginning to think about RCTs. The push for more experimental research in education can be best answered not just by more experiments but by experiments buttressed by an array of preliminary studies of many types. (p. 25)

While there is a call for randomized clinical trials in education (i.e. No Child Left Behind Act, 2001; National Institute of Child Health and Human Development, 2000), the value of other research designs should not be underestimated. Randomized clinical trials may provide the strongest, most authoritative evidence of the effect of a treatment, yet even in medical research, other designs are used because "a significant portion of research simply cannot be conducted with randomized clinical trials" (Riehl, 2006, p. 25). Following such an explanation, the value of conclusions drawn from multiple studies using various research designs is evident.

Achievement Effects

Despite the conclusion reached by the National Reading Panel (2000) regarding the lack of sufficient evidence to support SSR as a viable instructional practice, many researchers have concluded SSR provided statistically significant results. In many of these, the findings were favorable toward SSR as a means to improve reading achievement.

Though only fourteen studies met the National Reading Panel standards for inclusion, Krashen (2004) analyzed results of many more studies that contained significant findings related to reading comprehension. Krashen (2004, 2006) took the National Reading Panel report to task, claiming that it overlooked many studies that should have qualified for the report. In so doing, the NRP report failed to include SSR as an effective instructional practice.

Krashen (2006) reported,

In eight out of ten studies that tracked pupils in long-term SSR programs of 12 months or more, students who read recreationally outperformed their counterparts in classes that lacked leisure reading – and in the other two studies there was no difference between the two groups. (p. 43)

Based upon his analysis of studies of the effect of SSR on reading comprehension, Krashen (2004) concluded "in-school free reading programs are consistently effective. In 51 out of 54 comparisons (94 percent), readers do as well as or better than students who were engaged in traditional programs" (p. 2). He further indicated that the longer the reading program continued, the more consistent the results.

Though thorough, even Krashen's (2004) analysis of research on SSR was not

entirely exhaustive. A program implemented at a Georgia high school included SSR; results of the program showed that student achievement in reading increased from the 34th percentile to the 57th percentile during the four years of implementation of the program (Weller and Weller, 1999).

A study comparing ITBS scores for middle grades students found that reading achievement scores of recreational readers were significantly higher than those of non-recreational readers (Arthur, 1995). Arthur (1995) surveyed students about their interests and hobbies, and then compared ITBS scores of students who claimed to be recreational readers to those who were not readers. She also reported that "students today are reading when they are able to choose what they read rather than what adults feel they should be reading" (Arthur, 1995, p. 5). Arthur's (1995) comments on the benefit of self-selection were echoed throughout the literature (Pilgreen, 2000; Krashen, 2004; Gardiner, 2005).

Higher achievement also was noted by Erazmus (1987). This study found that lower achieving students who participated in an SSR program showed greater gains in reading achievement on the Metropolitan Achievement Test than a control group who chose not to participate in the voluntary reading program. Middle and high performing students in the experimental groups showed no significant difference from the control groups for these levels (Erazmus, 1987). This is a logical finding because of the ceiling effect in which middle and high performers do not have as great an opportunity for improvement on such tests. As a further point in support of the use of SSR in the classroom for lower achieving students, Krashen (2005) noted, "In-school reading programs are likely to be of benefit to less mature readers, for they provide reading exposure and get students interested in reading" (p. 446).

In *Becoming a Nation of Readers*, Anderson, Hiebert, Scott, and Wilkinson (1985) noted, "Research suggests that the amount of independent, silent reading children do in school is significantly related to gains in reading achievement" (p. 76). The automaticity that practice produces is essential for students to become good readers. In his early description of SSR, McCracken (1971) characterized SSR as "the *drill* of silent reading; it is the drill or practice necessary in learning to read, not a total reading program" (p. 521). The necessity for practice in reading does not need to be underestimated, yet Edmondson and Shannon (2002) lamented that the National Reading Panel's determination that SSR cannot be considered reading instruction is encouraging school administrators to eliminate the practice.

In response to the call by the NPR for scientific studies, Samuels and Wu (n.d.) conducted a six month experiment with third and fifth graders. The researchers used a quasi-experimental design in which "the control group spent 15 minutes per day reading books and the experimental group spent 40 minutes per day reading books" (p. 2). The conclusion drawn from this study indicated "that more time spent reading had a significant effect on achievement" (p. 2). A second implication gathered from this study revealed that lower ability students performed better under the 15 minute time limit, most likely due to their limited attention span (p. 19).

Evidence gathered through a meta-analysis conducted by Lewis and Samuels (n.d.) "reveals not only a strong positive correlational relationship between reading time and reading achievement, but some probability of a causal relationship as well" (p. 21). The researchers found a moderately small overall correlation between reading exposure and reading achievement (p. 19). Further, eight experiments reviewed had large enough

effect sizes for the researchers to "conclude that spending time reading has at least a moderate causal effect on growth in reading outcomes" (p. 20). Of the studies examined, "the optimum independent reading time appears to be 10 to 30 minutes a day in addition to some form of skills instruction" (p. 20). From their meta-analysis, Lewis and Samuels (n.d.) found "that there is a positive and significant relationship between exposure to reading and reading outcomes" (p. 19).

Just as with any skill, be it athletic or academic, practice is essential for improvement to occur (Gardiner, 2005). Students need opportunities to practice reading. Krashen (2006) stated,

> In fact, research strongly suggests that free reading is the source of our reading prowess and much of our vocabulary and spelling development, as well as our ability to understand sophisticated phrases and write coherent prose. The secret of its effectiveness is simple: children become better readers by reading. (p. 43)

Students need supervised periods of reading practice, and the literature on students' attitudes and habits suggests that they need to be allowed to self-select their reading material for this practice to be most beneficial (Arthur, 1995; Kirby, 2003; Yoon, 2002).

Vocabulary acquisition also is a benefit of reading. Krashen (2004) reviewed studies in which participants increased their vocabulary knowledge through reading words in context. Direct instruction in word meanings is less effective than acquiring word knowledge through reading (Krashen, 2004). Citing a study on vocabulary acquisition, Krashen (2004) wrote, "It has been estimated that about one million words of reading for a fifth-grade child will result in vocabulary growth of several thousand words per year, enough to account for adult vocabulary size" (p. 46). This finding supports the

adoption of the Georgia Department of Education's standard for reading, a standard in which each student is expected to read a million words or an approximate equivalent of twenty-five books per year (Georgia, 2006).

Finally, Gardiner (2001), a long-time classroom teacher and proponent of SSR, stated a logical point: "Ten minutes of sustained silent reading does not subtract from instructional time; instead, this time offers significant opportunities for students' language and literacy development" (p. 35). The proponents of SSR do not suggest that this practice be the sum total of reading instruction for students; instead, it is a practice recommended as a part of a comprehensive literacy instructional program.

Characteristics of Successful SSR Programs

Pilgreen (2000) reviewed thirty-two studies of SSR programs to identify the commonalities of successful SSR programs. She found eight common characteristics across the studies. She compiled these characteristics and described SSR programs that use them *stacked for success* (Pilgreen, 2000, p. 8). These characteristics included ready access to books; appeal through student choice in book selection; a quiet, comfortable, uninterrupted environment; encouragement, especially through teacher modeling of reading habits; staff training on the concept of free voluntary reading; non-accountability, with permission to stop reading books they don't like; non-evaluative follow-up activities to share their reading; and distributed time to read (Pilgreen, 2000). A discussion of each of these characteristics follows.

Access. Perhaps the most distinguishing factor of successful SSR programs was the ready access students had to books. Materials, including paperback books on a wide array of interesting topics and readability levels, comics, magazines, and newspapers,

were available to students in the classroom. Though students were allowed to bring their own reading materials, they were not required to do so, as there was availability in the classroom. In some instances, teachers facilitated visits to the library (Pilgreen, 2000).

Gardiner's (2005) opinion differed from Pilgreen's (2000) recommendation on the variety of reading materials and classroom libraries. From his standpoint as a classroom teacher, short reads, such as magazines and newspapers, caused noise when students turned pages during SSR, thus disrupting the environment for others. These materials also lacked the sustainability that longer works provided, he argued. Gardiner (2005) wanted his students reading a book because it "provides continuity in their reading" (p. 36). Furthermore, he did not provide a classroom library; he preferred to introduce students to the school library, which was better funded and could provide a larger selection, and because he wanted students to be comfortable in the library exercising a lifelong skill of searching for books there (p. 37).

In her effort to provide access to books for her students, teacher Jodi Crum Marshall (2002) encountered difficulty, and significant personal expense, when she attempted to create a classroom library to meet the needs and interests of her students. Providing a sufficient supply and a wide array of texts to interest students required more funds; she sought these from her principal, the PTA, and a local newspaper, yet found she still needed more. This was when she turned to the library. After preparing her students in how to select books, they took field trips to both the school library and the local library (Marshall, 2002). In this way, Marshall not only provided access to books for her students at the time, but also she prepared her students for a lifetime of reading by introducing them to the public library.

Although classroom libraries were recommended by some researchers (Pilgreen, 2000), access to reading material can be provided through opportunities to visit school and public libraries, as teachers Gardiner (2005) and Marshall (2002) did. "The key to providing access" as Pilgreen (2000) summarized in her review of successful SSR studies, "was that the researchers made sure that students were directly provided with a large number of readily available reading materials. The burden did not fall upon the readers to locate their own reading materials outside of school"(p. 9). As Gardiner (2005) said, "I must provide access to books, but I don't have to provide the books" (p. 36). Thus, as one aspect of promoting a successful SSR program, teachers bear the responsibility for providing students with opportunities to select books.

Appeal. The concept of appeal encompasses "a wide spectrum of materials" that are "genuinely inviting to students" (Pilgreen, 2000, p. 9) and the element of self-selection "because it is difficult for readers to develop a sense of ownership and purpose if someone else is telling them what to read" (Pilgreen, 2000, p. 9).

Several studies indicated adolescent readers value choice in both topics and reading material (Pitcher, et. al., 2007). A survey of more than 1,700 sixth graders to ascertain what made them want to read revealed the importance of choice, along with time to read during the school day, and teacher read alouds (Ivey & Broadus, 2001). In fact, 42% of the surveyed students indicated "they were motivated by finding good materials to read and having choice in the selection of these reading materials" (Ivey & Broadus, 2001, p. 361). Providing appealing materials for students to select is central to motivating students to read.

Some teachers may choose to include magazines, newspapers, comic books, and

other short reads as acceptable during SSR; others, like Gardiner (2005), however, may

not. Appeal need not be lessened because of a restriction to read only books; teachers

should include books on a variety of topics of interest to their students. Limiting book

choices to the classics, or to those generally considered worthy of being taught in English

classes, would "change the SSR program from student-centered to teacher-directed, thus

removing the vital choice so important to helping students become good readers"

(Gardiner, 2005, p. 67). Such a move would possibly stymie an SSR program.

The idea of choice is widely noted in the literature as a key element of successful

SSR programs (Pilgreen, 2000; Gardiner, 2005; Marshall, 2002; Atwell, 2007). Atwell

(2007) defended students' right to choose: "The only surefire way to induce a love of

books is to invite students to select their own. […] Personal preference is the foundation

for anyone who will make of reading a personal art" (pp. 12-13). She further added,

"children who choose books are more likely to grow up to become adults who read

books" (p. 27). Encouraging students to select reading material that piques their interests

is essential to achieving the goal of creating lifelong readers. Even for the most reluctant

readers, a good book match can be transformational. As described by Gardiner (2005),

the *home run book* is one that changes a reader's life by turning him on to reading;

through choice, students may find this home run book (p. 75). SSR's "student-centered

book selection sets the stage so nicely" for turning students on to reading (Gardiner,

2005, p. 76).

Pilgreen (2000) also noted that paperback books appeal to students more so than

hardbound books (p. 10). This element of appeal further supported her claim that

classroom libraries are important; typically, school libraries stock hardbound books,

whereas classroom libraries are usually stocked with the less expensive paperback version. Displaying books attractively can entice readers (Pilgreen, 2000, p. 10). To insure the utmost appeal of books, teachers need to be aware of their students' interests and seek both subtle (i.e. displays) and overt (i.e. booktalks) methods to advertise books to students. In contrast, Krashen (2004) cited numerous studies in which the number of books and the quality of library resources were correlated with student reading achievement. Ultimately, both sources of books contributed to the print-rich environment necessary for improved reading achievement.

Environment. The environment must be conducive to silent reading. Researchers acknowledged the need for a quiet classroom environment to allow students to concentrate on their reading (Pilgreen, 2000; Gardiner, 2005; Marshall, 2002). For some teachers, the SSR period was used as an opportunity to conference with students about their reading (i.e. Atwell, 2007; Marshall, 2005), yet other teachers also engaged in SSR during the period (i.e. Pilgreen, 2000; Gardiner, 2005).

Some classrooms were equipped with beanbag chairs, floor pillows, reading corners, lofts, and other accessories to create a home-like atmosphere in which to encourage reading. Teachers who provided such comfortable surroundings argued that adults preferred reading with their feet on an ottoman, or stretched out on their sofa or bed, so a reasonable expectation is that students will enjoy reading more if they, too, enjoy this kind of freedom (Pilgreen, 2000; Atwell, 2007; Marshall, 2002). Gardiner (2005), however, preferred students remain in their desks during the period. In spite of these differences, students in both kinds of settings have been successful in SSR programs.

The essential element, therefore, is not the casual comfort factor, but rather the noise factor, which requires that all students are quiet and still during SSR. Minimizing distractions within the classroom and from public address announcements is necessary so that students are not disrupted while reading.

Encouragement. Modeling silent reading is one form of encouragement for student readers. Pilgreen's (2000) research evidenced the importance of teachers modeling silent reading. She noted that adults reading in the school setting

> projected their conviction that reading was both pleasurable and worthwhile, disenfranchising students of the notion that reading in school was nothing more than a school task. Students came to see that the adults valued reading, and they, in turn, were willing to try it themselves. (p. 13)

Likewise, Gardiner (2005) asserted,

> My most important job in the classroom is to show them how an adult participates in reading and talking about reading. […] If SSR is truly to be sustained silent reading, everyone, including the teacher, needs to participate for the full time of each session. […] Modeling silent reading means I read with them every day, not just when it's convenient for me. (p. 39)

This aspect of successful SSR programs is tied to Bandura's (1977) social cognitive theory in which students learn from modeled behavior by imitating it. A fitting cliché summarizes this point: teachers should practice what they preach.

A recent study conducted by a team of eleven researchers using the Adolescent Motivation to Read Profile highlighted the importance of teacher modeling and excitement on student attitudes (Pitcher, et al., 2007). This study "noted the powerful

influence of teacher talk and modeling about books and authors," as well as "that

teachers' enthusiasm can have a tremendous impact on students' reading habits and

attitudes" (p. 393). Participants commented on the positive effects on their own reading

generated by their "teachers' excitement about reading, knowledge of various authors,

and enjoyment of certain books" (p. 393).

A second facet of encouragement includes sharing and discussing reading.

Talking about books with students engages their social nature and serves as a motivator.

In some of the programs Pilgreen (2000) studied, "students were asked to share 'the good

parts' with their friends" (p. 13). For teachers to be able to discuss books with students,

Marshall (2002) suggested teachers need to read young adult literature; this, she said, is

the best way to be credible in suggesting books to youngsters (p. 58).

Encouragement may take many forms: from teacher modeling of appropriate

reading behaviors to book discussions and opportunities for students to share their

reading with others. The importance of encouragement is best summed this way: "if our

ultimate goal is to spur students on to become lifelong readers, any type of

encouragement which leads to this end should be considered a viable part of SSR

program planning" (Pilgreen, 2000, p. 13).

Staff Training. Teacher training as a part of SSR programs can make a positive

difference in the success of the program. To set aside time for reading during the class

period is not sufficient. Teachers need to understand the rationale for SSR and how to

implement it, as well as know how to match students with books. Pilgreen (2000) noted,

"What seems to be critical is that they [teacher training programs] focused on motivating

teachers to learn strategies for linking students with books, highlighting the importance of

having all of the participating adults 'buy into' the concept of free reading" (p. 14).

Training helps teachers "develop their roles as active facilitators in helping students to

connect with books" (Pilgreen, 2000, p. 14). While some teachers receive professional

development training in their school settings, others, like Marshall (2002) and Gardiner

(2005), conduct their own research into effective SSR to improve their professional

practice.

Non-accountability. The original concept of SSR was accountability-free.

Students were encouraged to read, but no records were to be kept or tests given. In the

studies Pilgreen (2000) reviewed, 87% of SSR programs operated within the non-

accountability framework (p. 15). For many teachers, however, the notion of non-

accountability is uncomfortable; many feel they must have some form of student

reporting for the activity to constitute a legitimate part of the curriculum (Marshall, 2002;

Gardiner, 2005; Atwell, 2007).

Believing that there should be some form of accountability for student reading,

Gardiner (2005) has used various reporting methods, including book reports, oral reports,

and a chart form for reporting major literary elements. What he found was that these

methods defeated the very purpose which he was trying to accomplish: that of getting

students to read for pleasure. He now uses a very simple running record that asks

students to list the book title and number of pages they read. As students' lists lengthen

throughout the year, "a feeling of pride grows as the lines fill with book titles" (Gardiner,

2005, p. 32). This record provides students with tangible evidence of their progress as

readers.

As Trelease (2006) said, "Because it is supposed to be informal and free of

grades, SSR also provides students with a new perspective on reading – as a form of recreation" (p. 86). According to Pilgreen (2000),

> The key to non-accountability, as indicated by these successful groups, is to omit
> any activity that gives students the message that they are responsible for
> completing a task, comprehending a particular portion of their reading, or
> showing they have made improvement in some way. (p. 15)

Accountability measures, whether in the form of oral or written reports or other evaluative tasks risk preventing students from "experiencing the enjoyment of just relaxing with a good book, which is the goal of an effective SSR program" (Pilgreen, 2000, p. 15).

Most researchers agreed on the necessity of allowing students to put down a book they were not interested in continuing (Pilgreen, 2000; Atwell, 2007; Gardiner, 2005). This freedom was "an authentic practice that most adults engage in when we are bored with our own reading choices" (Pilgreen, 2000, p. 15). Atwell (2007) concurred, adding, "Abandoning a book that a reader isn't enjoying is viewed as a smart move, not a character defect" (p. 17). Consequently, changing books when interest wanes was not only acceptable, but also was encouraged.

Follow-up activities. Despite the emphasis on non-accountability in SSR programs, research indicated students needed opportunities to share their thoughts and ideas about their reading (Pilgreen, 2000; Marshall, 2002; Gardiner, 2005; Atwell, 2007). Follow-up activities can provide this avenue for student expression, encouraging "students to sustain their excitement about the books they have read" (Pilgreen, 2000, p. 16). These activities can be as elaborate as art, music, and science activities, or as simple

as small group discussions (Pilgreen, 2000, p. 16).

Booktalks, which are "short, direct, and mostly enthusiastic […] *endorsements* of particular titles, not oral reports," were employed in Atwell's (2007) classroom (p. 67). Not only should teachers recommend good reads to students, but also, she noted, "We make it even more likely that kids will find books they love when students, too, have opportunities to inform their classmates about the titles that are too good to miss" (Atwell, 2007, p. 67). The experiences of these teachers and researchers provided evidence that well-designed follow-up activities bred excitement among students. The challenge for teachers was to avoid linking these activities to evaluation.

Distributed Time to Read. Proponents of SSR generally acknowledged that distributing reading opportunities throughout the week was good practice. Fifteen to twenty minutes each day for SSR was preferable to lump sums of weekly or monthly reading. As proof, Trelease (2006) cited a study in which "children who had it [SSR] daily scored much higher than those who had it only once a week" (p. 84). Daily reading should be considered skill practice: "the more you use it, the better you get at it. Conversely, the less you use it, the more difficult it is" (Trelease, 2006, p 84). To illustrate the importance of daily practice, Gardiner (2005) suggested SSR is analogous to running; a runner would not save up his practice for one day a week and expect to get better, so neither should a reader save up reading for one day a week.

Summary

SSR as a classroom practice is theoretically supported by both social cognitive theory (Bandura, 1977) and engagement theory (Guthrie & Wigfield, 1997). These theories provide the framework for teacher modeling and the factors of motivation that

drive successful SSR implementations. Historically, various forms of SSR have been employed in classrooms across the nation since the idea was generated by Hunt in the 1960s.

Despite the popularity of SSR as a classroom practice and the many research reports of its success, most studies failed to meet the strict research requirements established by the National Reading Panel. This failure resulted in much criticism of the Panel's methodology and a growing concern for the continuation of SSR programs in schools.

On the contrary, Yoon's (2002), Krashen's (2004) and Pilgreen's (2000) analyses of the many studies available on SSR provided evidence that the practice of SSR has benefits. Among their findings were a positive effect on student attitudes and reading habits, and increased vocabulary and comprehension achievement for students of various ages and abilities.

Further investigation revealed eight characteristics that accompany successful SSR programs. These characteristics include ready access to books, appealing choices, a conducive environment, encouragement, non-accountability, participation in follow-up activities, and distributed time to read.

Chapter Three: Methodology

This study was designed to measure the achievement effects of a yearlong

implementation of SSR in a middle school. Using test score data collected over a three

year period, this researcher sought empirical evidence to determine whether there was a

relationship between daily SSR in school and reading achievement scores. Further

evidence was sought to determine whether the eight characteristics of SSR programs

affected achievement.   Chapter 3 begins with a description of the design of the study,

data collection procedures, and instrumentation. The sample selection is followed by a

discussion of the procedures and methodology used in the study.

Design of the Study

This study was an ex post facto using a repeated measures analysis of variance

(ANOVA) factorial design with cluster samples which measured participants'

achievement gains both before and after treatment. The cluster samples were intact

classroom groups in the selected school, all of whom participated in the treatment, which

was a one school year implementation of SSR. The study was conducted more than one

year after the completion of the 2007-2008 school year, the year in which the treatment

occurred. Consequently, no randomization or manipulation of the variables occurred in

this study. Because each participant contributed three scores over a three year period, the

repeated measures ANOVA was used to determine whether statistically significant

differences existed between pre and post treatment scores. The factorial design allowed

an efficient and powerful analysis of scores from three grade levels across three years

(Shaughnessy, Zechmeister, & Zechmeister, 2000). Additionally, a mixed factorial

design which incorporated "both an independent groups variable and a repeated measures variable" was used to analyze the scores of the two percentile groups (Shaughnessy, et al., 2000, p. 300). Finally, a univariate ANOVA was used to analyze the relationship between students' scores and the existence or non-existence of stacked for success traits.

Data Gathering Methods

The school administrator gave permission to conduct the study using scores of middle school students in this school. She also gave permission to interview teachers for the study. The Internal Review Board gave permission to use human subjects in the study (see Appendix A for permissions).

Test scores for the Stanford Achievement Test (SAT-9) from the spring 2006, 2007, and 2008 administrations were available at the school. Scores were exported from the student data system at the school.

Classroom assignments during the SSR period were collected from class rosters. Interviews with teachers using a survey format resulted in an implementation code of 0 or 1 for each student. A code of 0 was assigned to students whose classrooms exhibited fewer than six of the stacked for success characteristics, while a code of 1 was assigned to students whose classrooms exhibited six, seven, or eight of the characteristics. This coding was determined after studying Pilgreen's (2000) research in which she stated, "Though not every successful group included each factor, six of the factors were incorporated the most consistently: access to books, book appeal, conducive environment, encouragement to read, non-accountability, and distributed time to read. […] However, these results do not suggest which factors are more important than others" (p. 6). For the purpose of answering the third research question, the students were

labeled based on the number of factors each teacher reported as being present regularly or always during daily SSR, with six factors serving as the minimum number of traits present in a stacked for success program.

Instrumentation

      Stanford Achievement Test, Ninth Edition. Reading achievement in this study was measured by scores on the Stanford Achievement Test, Ninth Edition (SAT-9). Students at the school took the reading and math sections of this test each spring, and the results were reported annually to the Georgia Department of Education as an accountability measure for student performance. The test was administered by certified teachers to their respective homeroom students.

      The reading section of the SAT-9 was composed of two sections, Reading Vocabulary and Reading Comprehension. These two subsections comprised the Total Reading score. Reading Vocabulary was measured with 30 test items, and Reading Comprehension was measured with 54 test items; thus, Total Reading was composed of 84 items.

      The SAT-9 was a nationally norm referenced standardized test. Norms used were from 1995. Technical data accessed for this test indicated the SAT-9 was a reliable indicator of student achievement in reading (Stanford, 1996). The reliability coefficient for each of the tests used in this study was 0.94 or above, and the standard error of measurement ranged from 3.67 to 3.78 (Stanford, 1996, pp. 71-75). Table 1 provides the specific data for each level of the test.

      The test was considered a valid instrument for measuring student progress in reading at this school. Prior to adopting the test as an annual measure, school officials

compared test objectives to curriculum objectives. Satisfied that the test would serve as

an acceptable measure of student achievement, the school adopted the test as content

valid (Pinson, personal communication, 2009).

Table 1

Standard Error of Measurement and Reliability Coefficients for Total Reading, SAT-9,

Form S, Spring Standardization Sample

Grade Level	SEm	r
Intermediate 1 (Grade 4)	3.67	.95
Intermediate 2 (Grade 5)	3.76	.94
Intermediate 3 (Grade 6)	3.78	.94
Advanced 1 (Grade 7)	3.76	.94
Advanced 2 (Grade 8)	3.77	.94

(Stanford, 1996, pp. 71-75)

According to the Technical Data Report, "A test battery, once determined to be

content valid for a given curriculum, is further valid only to the extent that the students

exposed to that curriculum have the opportunity to answer all of the questions in the

battery" (Stanford, 1996, p. 43). Because standardized tests are timed, completion rates

indicate the degree to which students have adequate time to complete a particular subtest.

Student completion rates for the multiple choice subtests ranged from 90 to 100 percent

(Stanford, 1996, pp. 241-242).

In addition, the Technical Data Report (Stanford, 1996) provided the mean scaled

score for the spring administration at each grade level. These scores indicated the

average year-to-year gains. The scaled score was the key indicator used for this study to

determine the achievement effects of SSR. Mean scaled score data and mean differences between levels are provided in Table 2. The grade level at which each test was administered at the school is included.

Table 2

Mean Scaled Scores, Standard Deviations and Differences by Test Level for Spring Administration

SAT-9	Intermediate 1 Grade 4		Intermediate 2 Grade 5		Intermediate 3 Grade 6		Advanced 1 Grade 7		Advanced 2 Grade 8	
	M	*SD*	*M*	*S.D*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Total Reading	637.2	44.1	652.1	39.1	661.5	38.1	678.5	38.6	690.3	40.1
Difference			+14.9		+9.4		+17.0		+11.8	
Reading Vocabulary	638.0	49.9	655.5	44.0	666.8	42.7	688.5	44.7	697.2	46.3
Difference			+17.5		+11.3		+21.7		+8.7	
Reading Comprehension	637.7	45.3	651.1	40.5	659.5	40.0	674.1	40.0	687.5	41.4
Difference			+13.4		+8.4		+14.6		+13.4	

(Stanford, 1996, pp. 396-397)

Teacher response. Guided survey interviews with teachers were conducted to determine their level of implementation based on the eight stacked for success traits. The interview script with the survey instrument is included as Appendix B. The script contained a description of each of the traits. A numeric rating scale of 1 (*factor never present*) to 4 (*factor always present*) on the survey instrument was used to measure teachers' perception of their implementation of the SSR characteristics. These responses were then tallied to determine the number of characteristics present in each teacher's classroom during SSR.

A similar instrument measuring these traits was used by Fisher (2004) to survey teachers concerning a high school implementation of SSR. The researcher requested a copy of the survey via email to Fisher. Fisher replied that the survey was "very simple," but that he did not retain a copy of the survey (D. Fisher, personal communication, 2009). In its place, the researcher created a survey to measure the number of traits present in the classroom during SSR. The instrument was validated by interviewing teachers at the school site who had used SSR in their classrooms, but who were not involved in the present study.

Sampling Procedures

Students enrolled in sixth, seventh, and eighth grades at the school during the 2007-2008 school year were the subjects of this research study. Students also had to be enrolled in 2005-2006 and 2006-2007 to have taken the SAT-9 in spring 2006 and 2007 to have pretest measures available for comparison to the 2008 posttest. Thus, 35 sixth graders, 40 seventh graders, and 18 eighth graders comprised the sample.

These students lived in the ninth poorest Congressional District in America (Proximity, 2008). The level of parental education in the community was relatively low, with few having attended college and many not having graduated from high school (L. Pinson, personal communication, 2009). Most families had at least one parent in the workforce. Of the students in the study, 85 were Caucasian, five were African American, and three were Asian. Seventeen students qualified for the free lunch program, and 14 students qualified for reduced price lunch. Fifty were female, and 43 were male.

As a requirement for student enrollment at the charter school, parents agreed to volunteer at the school each semester and support the policies of the school. The school

was a public school, operating under a waiver of state education laws in accordance with

Georgia charter school laws. Students attending the school resided in the county in

which the school was located. Enrollment preference was given to students residing in

the designated attendance zone; however, as space allowed, students from throughout the

county were eligible to attend.

In addition, the responses from teachers who were employed in the school during

the 2007-2008 school year were included in the study. These included six women and

two men, all Caucasian.

Procedures

For this ex post facto research study, students participated in a school year

program of twenty minutes daily of SSR. Third period teachers monitored students

during the SSR treatment. Because this was an ex post facto study, no controls or

manipulation of the variables occurred during the year in which students participated in

the treatment, nor in the years prior to the treatment.

Students were allowed to read novels, magazines, newspapers, textbooks, or any

reading material of their own choosing. At the discretion of each teacher, students may

have been asked to record the book title and number of pages read, along with a few

comments about what they read during the period. The only school-wide rule in place

during the period was that all students must be in the room reading during the allotted

twenty minutes. The degree to which students in each classroom participated in SSR was

at the discretion and management of the classroom teacher.

The mean difference in students' reading scores from the 2006 and 2007

administrations of the SAT-9 from the school were used as the pretest measure. These

scores were obtained prior to the implementation of the SSR program. The scaled score was used, as it was a between-levels equivalent measure, which revealed achievement gains, if any existed.

Treatment posttest scores were from the 2008 administration of the SAT-9. The mean difference in reading scores from the 2007 and 2008 administrations of the SAT-9 was used as the post treatment measure. The pretreatment difference was obtained from the difference between the 2006 and 2007 scores.

Research Questions and Null Hypotheses

Eleven null hypotheses were used to answer the three research questions.

1. Does a program of sustained silent reading contribute to higher reading achievement scores in the middle grades?

H_01_1 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for sixth graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

H_01_2 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

H_01_3 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for eighth graders on the

reading section of the Stanford Achievement Test, Ninth Edition (SAT-9)

will show no difference when compared to the mean gain scores obtained

the previous school year when no sustained silent reading period was in

effect.

H_01_4 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for sixth graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

H_01_5 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for seventh graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

H_01_6 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for eighth graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

H_01_7 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for sixth graders on the

comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_8 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

H_01_9 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for eighth graders on the comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

2. Do lower performing students exhibit different gains in reading achievement than higher performing students when sustained silent reading is implemented?

H_02 The post-test mean gain scores of middle school students whose pretest score on the reading section of the SAT-9 was at or below the 40th percentile and middle school students whose pretest score was at or above the 60th percentile will show no difference.

3. Is student achievement in reading affected by the implementation of the eight

    stacked for success traits during sustained silent reading programs?

$H_0 3$ Post-test mean scores for Total Reading on the SAT-9 of middle school

    students who participated in sustained silent reading in a classroom

    characterized by six or more of the *stacked for success* traits will show no

    difference when compared to post-test mean scores of middle school

    students whose classrooms were characterized by fewer than six traits.

Data Analysis Procedures

This study compared changes in students' scores on the reading section of the

SAT-9 to determine if there were significant differences between achievement score

gains obtained before and after the implementation of a school-year-long program of

SSR. The post treatment scores for each group were compared to the pretreatment scores

to determine the change in score, thus allowing any significant differences that existed as

a result of the treatment variable to surface.

The statistical analyses conducted using Statistical Package for the Social

Sciences (SPSS) yielded partial eta squared (η_P^2) effect sizes. As Ary, Jacobs, Bazavieh,

and Sorenson (2006) described, "Effect size can be used to compare the direction and the

relative magnitude of the relationships" and "to help decide whether the difference an

independent variable makes on the dependent variable is strong enough to recommend its

implementation in practice" (pp. 155-156). For all tests, significance was set at the .05%

level. Partial eta squared ranges, as they related to Cohen's *d,* were used to determine

effect sizes. Interpretation of Cohen's *d* follows: $0.2 =$ small, $0.5 =$ medium, and $0.8 =$

large. Cohen indicated the partial eta squared ranges equate to the established effect sizes

as follows: small, $.01 \leq \eta_P^2 < .06$; medium, $.06 \leq \eta_P^2 < .14$; large, $\eta_P^2 \geq .14$ (as cited by

Barnette, 2006, p. 89). One advantage of using effect size measurements is that they

"provide information about the *amount* of impact an independent variable has had. Thus,

they complement tests of statistical significance which give only an indication of the

presence or absence of an effect of an independent variable" (Shaughnessy, et al., 2000,

p. 257). Furthermore, effect size measures can be used by other researchers conducting

similar experiments to determine the consistency of the effects of the same variables

(Shaughnessy, et al., 2000, p. 257).

To answer the first two research questions and the associated null hypotheses,

scores from the same students across three years were analyzed using repeated measures

ANOVA. A 3 x 3 (Grade x Year) repeated measures factorial ANOVA was conducted

for the first research question, while a 3 x 3 x 2 (Grade x Year x Percentile) repeated

measures mixed factorial ANOVA was used to answer the second research question. A

univariate ANOVA was used to answer the third research question, which focused on the

implementation of the eight characteristics in the classroom during the SSR period.

For the first, second, and third null hypotheses, scores from the Total Reading

section were analyzed. For the fourth, fifth, and sixth null hypotheses, scores from the

Reading Vocabulary section were used, and for the seventh, eighth, and ninth null

hypotheses, scores from the Reading Comprehension section were used. For the tenth

null hypothesis, scores from all three sections were analyzed. For the eleventh null

hypothesis, only scores from Total Reading were used.

Not only were grade level differences in the group studied, but also the scores of

students who scored below the 40th and above the 60th percentiles on the treatment pretest

in each of the three grade levels were analyzed for differences in pre and posttest effects. This hypothesis was included to determine if significant differences in gains occurred between lower achieving students and higher achieving students, as in a study reported by Erazmus (1987).

A benefit of the selected methodology was that "the two-variable factorial design" required "fewer participants than would two one-way designs for the same degree of power," while also allowing for "greater generalizability of the results" (Howell, 2004, p. 401). According to Howell (2004), "When we measure subjects repeatedly, however, we can assess subject differences and separate them from error. This produces more powerful experimental design and thus makes it easier to reject H_0" (p. 431), although it is possible that there may be carry-over of previous effects in that something learned earlier may affect the test at the end. Noted by Shaughnessy et al. (2000) as a "powerful" research tool, complex designs such as those undertaken in this study, are "remarkably efficient" in that they "allow us to determine the main effects of each of the [...] variables, the [...] two-way interactions, and the simultaneous interaction of all [...] variables" (p. 330).

According to Ary et al. (2006), "Because both experimental and control groups take the same pretest and posttest, and the study occupies the same period of time, other threats to internal validity such as maturation, instrumentation, pre-testing, history, and regression [...] should not be serious threats to internal validity" (p. 342). Because the SSR period occurred at the same time of day for all students involved in the study, threats to internal validity as a result of the interaction of selection and maturation were also decreased.

Additionally, the curriculum standards and associated textbooks for English/Language Arts for both the 2006-2007 school year and 2007-2008 school year were the same. While teachers may have presented lessons differently from year to year, this was not expected to account for significant differences in the scores as the curriculum expectations remained static.

Furthermore, all students enrolled in the selected grades in the school during the three years (2006, 2007, and 2008) who participated in the SSR program were included in the study, so selection bias was not considered a factor, other than that enrollment in the school was a selection factor because parents elected to send their children to this school.

Selection-regression was a possible threat, as either group could potentially have had pretest scores above or below the mean. Considering that the annual performance goal for the school was for grade level scores to average at or above 60th percentile, regression toward the mean was a possible threat in any of the three years from which the data were taken.

Responses to the guided survey interview were coded to determine how different teacher practices affected the scores. Based on responses, each teacher was identified with an implementation code of 0 or 1. Zero was assigned to teachers whose classrooms exhibited fewer than six of the stacked for success characteristics, while teachers whose classrooms exhibited six, seven, or eight characteristics were assigned a code of 1. Each student then received a code of 0 or 1 based on the classroom teacher to whom he or she was assigned during the SSR period.

Summary

This study used an ex post facto design to test five eleven hypotheses related to

student achievement and SSR. Using the mean gain of students' achievement scores from 2006 to 2007 as a control measure, the study then used the mean gain of students' scores from 2007 to 2008 as the experimental measure. Effects on vocabulary and comprehension were analyzed using scores from the SAT-9 subtests. Achievement differences of higher and lower performing students, as well as the effect of the implementation of the stacked for success traits, were examined.

Chapter Four: Findings

This chapter will present the results of the statistical analyses conducted to answer the three research questions and the eleven associated null hypotheses. The chapter begins with a summary of the purpose of the study and a review of the data collection procedures and methodology used. The research questions and the null hypotheses are then addressed. For clarity, tables present key statistical findings, and figures graphing the mean scores accompany the results.

Purpose of the Study

The purpose of this ex post facto study was to determine if there were statistically significant differences in achievement gains between middle school students' (grades 6, 7, and 8) scores on the Stanford Achievement Test, Ninth Edition (SAT-9) before and after the implementation of a one school year program of twenty minutes of daily SSR across the three grade levels.

Data Collection and Analysis

The data for this study were collected from the student information system at the school. Scores from ninety-three middle school students were used; the sample was comprised of 35 sixth graders, 40 seventh graders, and 18 eighth graders. These students were selected because they were present in the school all three years (2006, 2007, and 2008), they took the SAT-9 in each of those years, and they participated in a program of twenty minutes of daily SSR in the 2007-2008 school year. Of the students in the study, 85 were Caucasian, five were African American, and three were Asian. Seventeen students qualified for the free lunch program, and 14 students qualified for reduced price

lunch. Fifty were female, and 43 were male.

For sixth graders in the study, the scores were obtained from their fourth, fifth, and sixth grade years; for seventh graders in the study, the scores were obtained from their fifth, sixth, and seventh grade years; and for eighth graders in the study, the scores were obtained from their sixth, seventh, and eighth grade years. Mean gains from 2006 to 2007 and from 2007 to 2008 were compared to determine whether reading achievement gains differed following the implementation of SSR in the middle grades.

A school-wide implementation of SSR occurred in the 2007-2008 school year. The administration instructed teachers to have students spend twenty minutes each day prior to the beginning of their third period class engaged in silent reading of their own choosing. Students were allowed to select books, magazines, or newspapers from home, the school library, or the classroom library if one existed. No other formal instructions were given to teachers concerning the implementation of SSR (L. Pinson, personal communication, 2009). Although teachers were not made aware of the stacked for success traits prior to or during the implementation of SSR, teachers were interviewed for this study to determine whether these characteristics were present in their classrooms during the 2007-2008 school year.

Classroom assignments during the SSR period were collected from class rosters. Interviews with teachers resulted in an implementation code of 0 or 1 for each student. A code of 0 was assigned to students whose classrooms exhibited fewer than six of Pilgreen's (2000) stacked for success characteristics of SSR programs, while a code of 1 was assigned to students whose classrooms exhibited six, seven, or eight of the characteristics.

After collection of the SAT-9 scores from 2006, 2007, and 2008, the data were calculated using SPSS. A repeated measures factorial ANOVA design was used to answer the first research question and the associated null hypotheses. A mixed factorial repeated measures ANOVA was used to answer the second research question and the associated null hypothesis. A univariate ANOVA was used to answer the third research question and the associated null hypothesis.

Research Question 1

Does a program of sustained silent reading contribute to higher reading achievement scores in the middle grades?

H_01_1 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for sixth graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

H_01_2 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for seventh graders on the reading section of the Stanford Achievement Test, Ninth Edition (SAT-9) will show no difference when compared to the mean gain scores obtained the previous school year when no sustained silent reading period was in effect.

H_01_3 Following a school year of twenty minutes of daily sustained silent reading, student achievement mean gain scores for eighth graders on the

reading section of the Stanford Achievement Test, Ninth Edition (SAT-9)

will show no difference when compared to the mean gain scores obtained

the previous school year when no sustained silent reading period was in

effect.

A 3 x 3 (Grade [sixth, seventh, eighth] x Year [Year 1: 2006, Year 2: 2007, Year

3: 2008]) repeated measures ANOVA was conducted on Total Reading scaled scores.

The interaction between grade and year was significant, $F(4, 180) = 3.01$, $p = .02$, with a

medium effect size of $\eta_P{}^2 = .063$. This result indicated significantly higher achievement

for each grade in Total Reading in Year 3 following the treatment than in the previous

year without the treatment.

The mean gain of scores for Total Reading in each of the three grades was greater

in Year 3 than in Year 2. Sixth grade gained 10.45 points in Year 3, which was greater

than the 6.63 points gained in Year 2. Seventh grade gained 18.37 points in Year 3, a

higher gain than the 10.37 points gained in Year 2. Eighth grade gained 22.27 points in

Year 3, nearly twice as much as the 11.84 points gained in Year 2. Therefore, each of the

three null hypotheses for Total Reading was rejected.

Table 3 provides the descriptive statistics for Total Reading for each grade each

year. Because this study focused on the difference in gains between years, these

differences also are shown in the table.

Figure 1 provides a visual representation of the gains in Total Reading scaled

scores across the three years for each grade. This figure reveals nearly parallel slopes

across the three years for grades seven and eight. A small gain occurred for all grades in

Year 2. All grades experienced a greater increase in Year 3 than in Year 2, with both

seventh grade (*M* = 697.02, *SD* = 28.77, gain = 18.37) and eighth grade (*M* = 707.83, *SD* = 28.63, gain = 22.27) experiencing a steeper increase in Year 3 than sixth grade experienced in Year 3 (*M* = 676.74, *SD* = 31.02, gain = 10.45). A nearly parallel increase was evident for both sixth and seventh grades during the year in which each group was enrolled in sixth grade, one group prior to the treatment, the other during the treatment.

Table 3

Descriptive Statistics for Total Reading Scaled Scores

Grade/Year	*M*	*SD*	*difference*	*N*
Sixth Grade				
Year 1: 2006	659.66	32.15		35
Year 2: 2007	666.29	27.76	+6.63	35
Year 3: 2008	676.74	31.02	+10.45	35
Seventh Grade				
Year 1: 2006	668.28	24.07		40
Year 2: 2007	678.65	35.14	+10.37	40
Year 3: 2008	697.02	28.77	+18.37	40
Eighth Grade				
Year 1: 2006	673.72	26.28		18
Year 2: 2007	685.56	20.98	+11.84	18
Year 3: 2008	707.83	28.63	+22.27	18
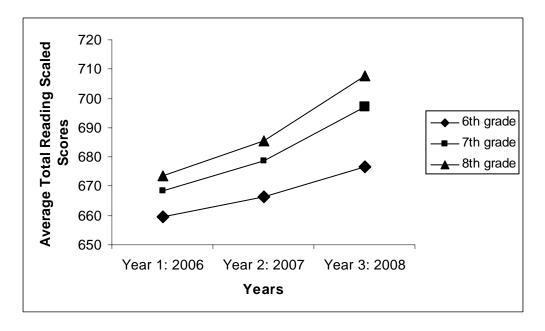
Figure 1. Average Total Reading Scaled Scores as a Function of Years.

$H_0 1_4$ Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for sixth graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

$H_0 1_5$ Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for seventh graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

$H_0 1_6$ Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for eighth graders on the

vocabulary subtest of the SAT-9 will show no difference when compared

to the mean gain scores of the vocabulary subtest obtained the previous

school year when no sustained silent reading period was in effect.

A 3 x 3 (Grade [sixth, seventh, eighth] x Year [Year 1: 2006, Year 2: 2007, Year 3: 2008]) repeated measures ANOVA was conducted on Reading Vocabulary. The significant interaction between grade and year for Reading Vocabulary, $F(4, 180) = 2.90$, $p = .024$, with a medium effect size of $\eta_P{}^2 = .06$, indicated that vocabulary achievement at each grade level differed significantly each year. As Table 4 shows, Year 2 gains for sixth grade and for eighth grade were more than twice as large as Year 3 gains. However, seventh grade showed gains nearly four times greater in Year 3 than in Year 2.

The mean gain of scores for Reading Vocabulary in two of the three grades was greater in Year 2 than in Year 3. Sixth grade gained 17.66 points in Year 2 and posted a smaller gain of 7.97 points in Year 3. Seventh grade gained 6.30 points in Year 2 and 25.65 points in Year 3. Eighth grade gained 24.73 points in Year 2 and 10.72 points in Year 3. Because there were significant differences in reading vocabulary scores in each grade across the three years, the three null hypotheses for reading vocabulary were rejected.

Table 4 provides descriptive statistics and the gains for Reading Vocabulary for each grade each year. Figure 2 provides a visual representation of vocabulary scores across the three years for each grade. Figure 2 shows that, of the three grades, seventh grade achieved the greatest gains in Year 3. Sixth and eighth grade vocabulary gains were greater in Year 2 than in Year 3. The figure also indicates a noticeably parallel increase for both sixth and seventh grades during the year in which each group was enrolled in sixth grade, one group prior to the treatment, the other during the treatment. A parallel gain also is evident with seventh and eighth grades during the year in which

each group was enrolled in the seventh grade, one group prior to the treatment, the other during the treatment.

Table 4

Descriptive Statistics for Reading Vocabulary

| Grade/Year	*M*	*SD*	*difference*	*N*
Sixth Grade				
Year 1: 2006	655.34	36.59		35
Year 2: 2007	673.00	31.03	+17.66	35
Year 3: 2008	680.97	35.77	+7.97	35
Seventh Grade				
Year 1: 2006	677.18	38.37		40
Year 2: 2007	683.48	33.68	+6.30	40
Year 3: 2008	709.13	36.03	+25.65	40
Eighth Grade				
Year 1: 2006	679.44	34.71		18
Year 2: 2007	704.17	32.98	+24.73	18
Year 3: 2008	714.89	34.55	+10.72	18
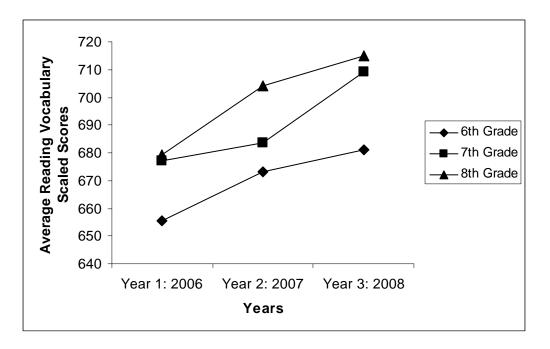
Figure 2. Average Reading Vocabulary Scaled Scores as a Function of Years.

H_01_7 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for sixth graders on the

comprehension subtest of the SAT-9 will show no difference when

compared to the mean gain scores of the comprehension subtest obtained

the previous school year when no sustained silent reading period was in

effect.

H_01_8 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for seventh graders on the

comprehension subtest of the SAT-9 will show no difference when

compared to the mean gain scores of the comprehension subtest obtained

the previous school year when no sustained silent reading period was in

effect.

H_01_9 Following a school year of twenty minutes of daily sustained silent

reading, student achievement mean gain scores for eighth graders on the comprehension subtest of the SAT-9 will show no difference when compared to the mean gain scores of the comprehension subtest obtained the previous school year when no sustained silent reading period was in effect.

A 3 x 3 (Grade [sixth, seventh, eighth] x Year [Year 1: 2006, Year 2: 2007, Year 3: 2008]) repeated measures ANOVA was conducted on Reading Comprehension. The interaction between grade and year was significant, $F(4, 180) = 2.57$, $p = .04$, with a small effect size ($\eta_P^2 = .054$), which indicated Year 3 scores at each grade level were higher than scores for Years 1 and 2 for each grade level. As Table 5 shows, the eighth grade increased slightly in Year 2 and had a larger increase in Year 3. Likewise, seventh grade showed a typical gain between Years 1 and 2, and then gained fifteen points in Year 3. Sixth grade remained flat between Years 1 and 2, and then increased in Year 3.

The mean gain of scores for Reading Comprehension in each of the three grades was greater in Year 3 than in Year 2. Sixth grade gained 12.31 points in Year 3, much more than the 0.63 points gained in Year 2. Seventh grade gained 14.83 points in Year 3, a few more points than the 11.15 points gained in Year 2. Eighth grade gained 24.38 points in Year 3, a large increase over the 6.45 points gain in Year 2. Therefore, each of the three null hypotheses for reading comprehension was rejected.

Table 5 provides descriptive statistics and the mean gains for Reading Comprehension for each grade each year. Figure 3 illustrates the gains in the scores.

Table 5

Descriptive Statistics for Reading Comprehension

Grade/Year	*M*	*SD*	*difference*	*N*
Sixth Grade				
Year 1: 2006	663.03	35.52		35
Year 2: 2007	663.66	30.19	+0.63	35
Year 3: 2008	675.97	33.94	+12.31	35
Seventh Grade				
Year 1: 2006	665.70	21.31		40
Year 2: 2007	676.85	38.95	+11.15	40
Year 3: 2008	691.68	28.41	+14.83	40
Eighth Grade				
Year 1: 2006	672.11	27.88		18
Year 2: 2007	678.56	23.86	+6.45	18
Year 3: 2008	702.94	28.07	+24.38	18

As Figure 3 illustrates, the increase in Reading Comprehension scores following the treatment increased noticeably. The sharpest increase in reading comprehension, a gain of 24 points, occurred in eighth grade in Year 3 following the treatment. A nearly parallel increase in scores was evident for both sixth and seventh grades during the year in which each group was enrolled in sixth grade, one group prior to the treatment, the other during the treatment. Scores for sixth grade between Year 1 and Year 2 remained flat.
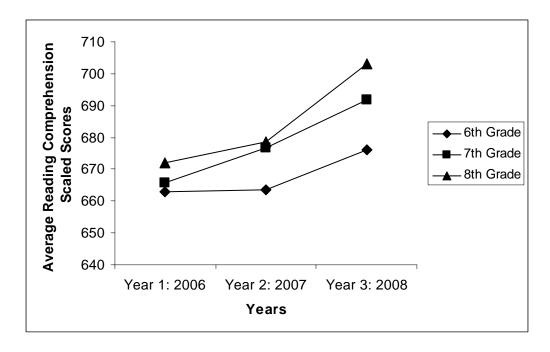
Figure 3. Average Reading Comprehension Scaled Scores as a Function of Years.

Research Question 2

Do lower performing students exhibit different gains in reading achievement than higher

performing students when sustained silent reading is implemented?

> $H_0 2$ The post-test mean gain scores of middle school students whose pretest
>
> score on the reading section of the SAT-9 was at or below the 40th
>
> percentile and middle school students whose pretest score was at or above
>
> the 60th percentile will show no difference.

To test this hypothesis, 3 x 3 x 2 (Grade [sixth, seventh, eighth] x Year [Year 1:

2006, Year 2: 2007, Year 3: 2008] x Percentile [40th, 60th]) mixed factorial repeated

measures ANOVA was conducted on Total Reading scores, Reading Vocabulary scores,

and Reading Comprehension scores. Students who scored at or below the 40th percentile

and who scored at or above the 60th percentile were included in this analysis.

The interaction between year, grade, and percentile was not significant, $F(4, 124)$

= .40, *p* = .81, η_P^2 = .013. Although Year 3 scores were higher than Year 1 and Year 2

scores at each of the grade levels for both the 40th and 60th percentiles, these differences

were not statistically significant. However, eighth grade experienced a slight decline in

Year 2 (*M* = 697.38, *SD* = 25.17) when compared to Year 1 (*M* = 698.00, *SD* = 16.25).

Table 6 shows the means, standard deviations, and differences for each grade each year at

the two percentile levels indicated in the study.

Table 6

Descriptive Statistics for Total Reading for the Two Percentile Groups

Grade/Year	At or Below 40th Percentile				At or Above 60th Percentile			
	M	*SD*	*difference*	*n*	*M*	*SD*	*difference*	*n*
Sixth Grade								
Year 1: 2006	608.80	9.5		5	676.48	23.48		23
Year 2: 2007	622.40	27.30	+13.60	5	679.26	17.24	+2.78	23
Year 3: 2008	635.20	17.64	+12.80	5	692.52	21.75	+13.26	23
Seventh Grade								
Year 1: 2006	634.83	16.02		6	684.86	18.06		21
Year 2: 2007	656.50	27.38	+21.67	6	692.57	36.96	+7.71	21
Year 3: 2008	674.33	24.83	+17.83	6	712.76	24.72	+20.19	21
Eighth Grade								
Year 1: 2006	648.00	9.95		5	698.00	16.25		8
Year 2: 2007	673.20	9.68	+25.20	5	697.38	25.17	-.62	8
Year 3: 2008	685.20	25.29	+12.00	5	724.88	20.24	+27.50	8

Figure 4 indicates the gains were similar for all grades in the group at or below the 40th percentile, both before and after the treatment. Seventh grade experienced the steepest growth in Year 3, with sixth and eighth grade growth appearing parallel. Eighth grade gained less with the treatment than in the year prior to the treatment. For sixth and seventh grades, the gains appear balanced between the pre and post treatment. Seventh grade in Year 2 gained slightly more than in Year 3.
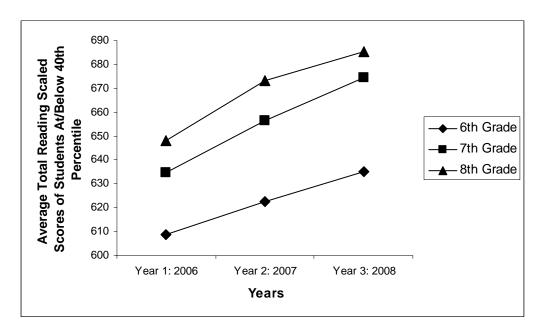
Figure 4. Average Total Reading Scaled Scores for Students Scoring At or Below the 40th Percentile as a Function of Years.

As Figure 5 illustrates, the Year 3 gains were much steeper for the group at or above the 60th percentile than for the group at or below the 40th percentile (see Figure 4), with none of the slopes being parallel. Eighth grade experienced the steepest gain, followed by seventh grade and then sixth grade. Only seventh grade achieved noticeable gains in Year 2; eighth grade and sixth grade remained flat, with eighth grade declining slightly less than one point in Year 2, and sixth grade gaining fewer than three points in Year 2.
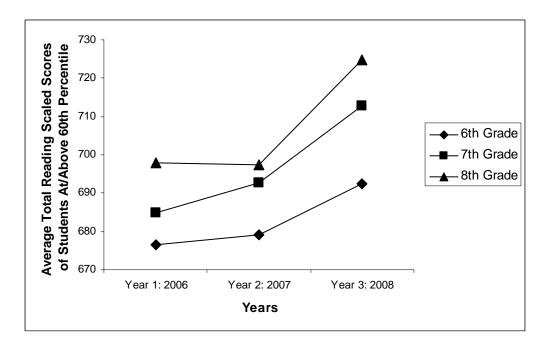
Figure 5. Average Total Reading Scaled Scores of Students Scoring At or Above the 60th Percentile as a Function of Years.

A 3 x 3 x 2 (Grade [sixth, seventh, eighth] x Year [Year 1: 2006, Year 2: 2007, Year 3: 2008] x Percentile [40th, 60th]) mixed factorial repeated measures ANOVA was conducted on Reading Vocabulary. The interaction between year, grade, and percentile was not significant, $F(4, 124) = .247$, $p = .911$, $\eta_P^2 = .008$. Although each group at each grade level scored higher in Year 3 than in Years 1 and 2, the gains for each group were not statistically different from one another. Table 7 provides data for the interaction between year, grade, and percentile for Reading Vocabulary.

Figures 6 and 7 illustrate the scores for each percentile group across the three years for each grade. Figure 6 shows seventh grade and eighth grade groups at or below the 40th percentile experienced similar gains both pre and post treatment, although the seventh grade Year 3 gain was slightly steeper than eighth grade. Sixth grade at or below the 40th percentile experienced smaller post treatment gains than pretreatment gains.

Table 7

Descriptive Statistics for Reading Vocabulary for the Two Percentile Groups

Grade/Year	At or Below 40th Percentile				At or Above 60th Percentile			
	M	*SD*	*difference*	*n*	*M*	*SD*	*difference*	*n*
Sixth Grade								
Year 1: 2006	611.20	20.93		5	667.35	34.36		23
Year 2: 2007	634.00	28.62	+22.80	5	684.17	24.50	+16.82	23
Year 3: 2008	645.00	14.66	+11.00	5	694.91	32.73	+10.74	23
Seventh Grade								
Year 1: 2006	644.67	34.96		6	697.05	37.96		21
Year 2: 2007	660.00	25.34	+15.33	6	699.05	29.98	+2.00	21
Year 3: 2008	681.33	27.28	+21.33	6	729.10	27.87	+30.05	21
Eighth Grade								
Year 1: 2006	665.40	29.29		5	699.62	32.86		8
Year 2: 2007	681.00	25.17	+15.60	5	721.00	36.07	+21.38	8
Year 3: 2008	697.80	32.12	+16.80	5	731.00	35.55	+10.00	8

Figure 7 indicates the seventh grade group at or above the 60th percentile remained virtually flat from Year 1 to Year 2, but this group experienced a steep gain in Year 3, reaching nearly the same point as eighth grade in Year 3 (seventh grade $M = 729$; eighth grade $M = 731$). Eighth grade and sixth grade experienced smaller gains post treatment than in pretreatment.
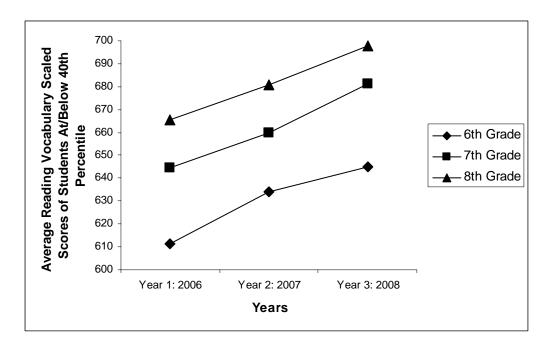
Figure 6. Average Reading Vocabulary Scaled Scores of Students Scoring At or Below

the 40th Percentile as a Function of Years.

Figure 7. Average Reading Vocabulary Scaled Scores of Students Scoring At or Above

the 60th Percentile as a Function of Years.

A 3 x 3 x 2 (Grade [sixth, seventh, eighth] x Year [Year 1: 2006, Year 2: 2007,

Year 3: 2008] x Percentile [40th, 60th]) mixed factorial repeated measures ANOVA was conducted on Reading Comprehension. The interaction between year, grade, and percentile was not significant, $F(4, 124) = .740, p = .566, \eta_P^2 = .023$. As Table 8 shows, Year 3 scores for each grade were higher than Year 1 and 2 scores. However, these gains were not statistically significant. Table 8 provides the descriptive statistics for the interaction between year, grade, and percentile for Reading Comprehension at each percentile level.

Figures 8 and 9 illustrate the gains experienced by the 40th and 60th percentile groups, respectively. Figure 8 shows the seventh grade group at or below the 40th percentile experienced similar gains both before and after the treatment. The sixth grade group at or below the 40th percentile experienced a greater gain after the treatment than prior to the treatment, while the eighth grade group at or below the 40th percentile experienced a smaller gain following the treatment than in the year prior to the treatment.

As shown in Figure 9, in Year 2 both the eighth grade and sixth grade at or above the 60th percentile group experienced declines over Year 1 scores. In Year 3, the eighth grade group at or above the 60th percentile rebounded sharply. The sixth grade group at or above the 60th percentile scored just above the seventh grade group in Year 1; in Year 2 this sixth grade group dropped. In Year 3, sixth grade returned to approximately the same level as seventh grade in Year 2. Increases between Years 2 and 3 for sixth and seventh grade at or above the 60th percentile were approximately parallel.

Table 8

Descriptive Statistics for Reading Comprehension for the Two Percentile Groups

| Grade/Year	At or Below 40th Percentile				At or Above 60th Percentile			
	M	*SD*	*difference*	*n*	*M*	*SD*	*difference*	*n*
Sixth Grade								
Year 1: 2006	606.60	16.01		5	682.65	24.11		23
Year 2: 2007	615.20	31.80	+8.60	5	677.78	18.78	-4.87	23
Year 3: 2008	629.60	23.73	+14.40	5	693.39	23.38	+15.61	23
Seventh Grade								
Year 1: 2006	631.83	9.22		6	681.52	13.17		21
Year 2: 2007	654.67	32.28	+22.84	6	690.05	41.87	+8.53	21
Year 3: 2008	670.50	26.42	+25.83	6	705.62	26.65	+15.57	21
Eighth Grade								
Year 1: 2006	640.40	4.45		5	699.13	13.94		8
Year 2: 2007	670.00	5.48	+29.60	5	689.63	31.52	-9.50	8
Year 3: 2008	679.80	26.54	+9.80	5	722.87	15.50	+33.24	8
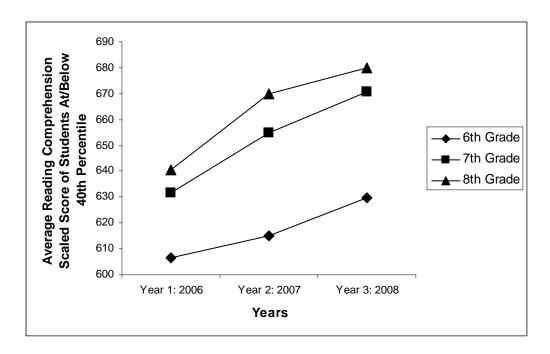
Figure 8. Average Reading Comprehension Scaled Scores of Students Scoring At or

Below the 40th Percentile as a Function of Years.

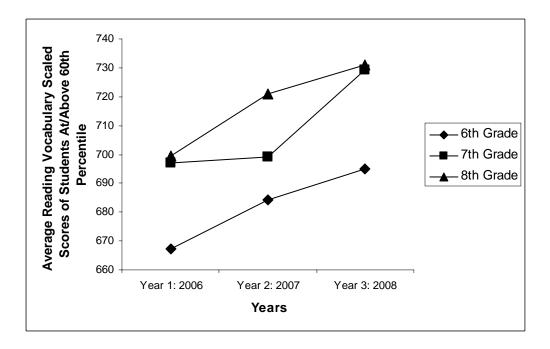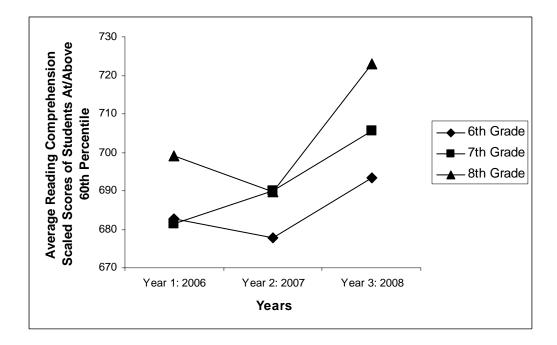*Figure 9.* Average Reading Vocabulary Scaled Scores of Students Scoring At or Above

the 60th Percentile as a Function of Years.

In Total Reading, the group which scored at or above the 60th percentile in each of

the three grades gained more in Year 3 than did the students in the 40th percentile and

below group. The sixth grade 60th percentile group gained 13.26 in Year 3, a gain similar

to that of the 40th percentile group which gained 12.80. The seventh grade 60th percentile

group gained 20.19 points in Year 3 compared to the 40th percentile group which gained

17.83 points. The eighth grade 60th percentile group gained 27.5 points while the 40th

percentile group gained 12 points.

In Reading Vocabulary, the sixth and eighth grade 40th percentile groups showed

greater Year 3 gains than the 60th percentile groups. The sixth grade 40th percentile group

gained 11 points, which was only slightly greater than the 60th percentile group's gain of

10.74 points. The seventh grade 60th percentile group gained 30.05 points compared to

the 40th percentile group's gain of 21.33 points. The eighth grade 40th percentile group

gained 16.80 points, while the 60th percentile group gained just 10 points.

In Reading Comprehension, sixth and eighth grade 60th percentile groups gained

more than the 40th percentile groups. The sixth grade 60th percentile group gained 15.61,

a gain slightly greater than the 14.4 point gain of the 40th percentile group. The seventh

grade 40th percentile group gained 25.83 points, compared to the 15.57 point gain of the

60th percentile group. The eighth grade 60th percentile group gained 33.24 points, while

the 40th percentile group gained just 9.8 points.

The gains experienced by the 40th and 60th percentile groups at each grade level

were not statistically different from one another in any of the test areas: Total Reading,

Reading Vocabulary, and Reading Comprehension. Therefore, the null hypothesis, the

post-test mean gain scores of middle school students whose pretest score on the reading

section of the SAT-9 was at or below the 40th percentile and middle school students

whose pretest score was at or above the 60th percentile will show no difference, was retained.

Research Question 3

Is student achievement in reading affected by the presence of the eight stacked for success traits during a sustained silent reading program?

> H$_0$3 Post-test mean scores for Total Reading on the SAT-9 of middle school students who participated in sustained silent reading in a classroom characterized by six or more of the *stacked for success* traits will show no difference when compared to post-test mean scores of middle school students whose classrooms were characterized by fewer than six traits.

A univariate ANOVA was conducted on Year 3 Total Reading scaled scores. Subjects participating in the treatment in classrooms characterized by six or more of Pilgreen's (2000) stacked for success traits were coded as having *traits*. Those subjects whose classrooms exhibited fewer than six of the traits were coded as having *no traits*.

The main effect for traits was significant, $F(1, 88) = 8.14$, $p = .005$, with a medium effect size ($\eta_P^2 = .085$), which indicated achievement was higher when six or more of Pilgreen's (2000) characteristics were reported in the classroom than when fewer than six of the traits were present. The traits group ($M = 700.14$, $SD = 28.07$, $n = 64$) scored significantly higher than the no traits group ($M = 672.38$, $SD = 31.38$, $n = 29$).

The interaction between grade and traits was significant, $F(1, 88) = 4.15$, $p = .045$, with a small effect size ($\eta_P^2 = .045$). In classrooms in which six or more of the stacked for success traits were reported ($M = 680.69$, $SD = 25.78$), sixth graders performed higher than in a sixth grade classroom which reported the presence of fewer

than six of the traits ($M = 674.41$, $SD = 34.10$). Likewise, in seventh grade classrooms in which the presence of six or more of the traits were reported ($M = 703.61$, $SD = 25.82$), seventh graders performed higher than in seventh grade classrooms which reported fewer than six of the traits ($M = 666.00$, $SD = 21.56$). All eighth grade groups reported the presence of six or more of the traits in the classroom ($M = 707.83$, $SD = 28.63$). All three grades considered together, the group reporting six or more traits present in the classroom ($M = 700.14$, $SD = 28.07$) performed higher than the group reporting fewer than six traits ($M = 672.38$, $SD = 31.38$).

The main effect for traits was significant ($p = .005$) and the interaction between grade and traits also was significant ($p = .045$). Therefore, the null hypothesis was rejected. Table 9 displays the data for the interaction between grade and traits and Figure 10 illustrates the difference in scores of the Traits and No Traits groups at each grade level.

Table 9

Descriptive Statistics for Traits and No Traits for Each Grade

Grade	Traits			No Traits		
	M	*SD*	*n*	*M*	*SD*	*n*
Sixth Grade	680.69	25.78	13	674.41	34.10	22
Seventh Grade	703.61	25.82	33	666.00	21.56	7
Eighth Grade	707.83	28.63	18			0
Total	700.14	28.07	64	672.38	31.38	29

As Figure 10 illustrates, scores of students who were in classrooms characterized

by six or more of the stacked for success traits scored higher on the SAT-9 than students who were in classrooms that reported fewer than six of the traits present. Scores of seventh graders in a no traits classroom were lower than sixth graders who were not in a traits classroom.
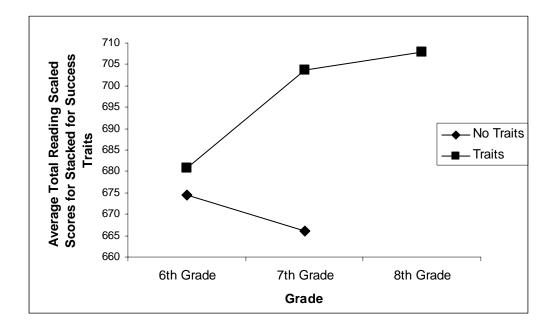
Figure 10. Average Total Reading Scaled Scores for *Stacked for Success* Traits as a Function of Grade.

Interview Results

Eight teachers were involved in the implementation of the SSR program in this middle school. SSR was scheduled for twenty minutes every day prior to the beginning of the third period class. Teachers were responsible for providing an environment for SSR and monitoring their third period students during SSR.

To determine how many of Pilgreen's (2000) stacked for success traits were present in each classroom during the SSR period, the researcher conducted a guided survey interview with each teacher. The teachers were informed of the risks and benefits

of participating in the study, and they signed a consent form (see Appendix C). On the survey instrument (see Appendix B), each trait was described, and teachers were asked to rate the presence of that trait on a scale of 1 to 4: 1 (*factor never present*), 2 (*factor present occasionally*), 3 (*factor present regularly*) or 4 (*factor present always*). Traits with an endorsement of 1 or 2 were considered not present; traits with an endorsement of 3 or 4 were considered present.

Each survey was tallied and assigned a code of 0 (*No Traits*) if fewer than six traits were endorsed with 3 or 4. They were assigned a code of 1 (*Traits*) if six or more of the traits were endorsed with a 3 or 4. Based upon their responses to the survey instrument, one sixth grade teacher was assigned a code of 1, Traits, and two sixth grade teachers were assigned a code of 0, No Traits. Two seventh grade teachers were assigned a code of 1, while one seventh grade teacher was assigned a 0. Both eighth grade teachers were assigned a code of 1. Subsequently, the classroom rosters were used to assign a code of 0 or 1 to each student in the classroom to match the teacher's code.

Traits with the highest endorsements were access ($M = 3.875$), distributed time to read ($M = 3.75$), conducive environment ($M = 3.375$) and non-accountability ($M = 3.25$). The mean endorsement for both appeal and encouragement was 3.0. Staff training ($M = 2.75$) and follow-up activities ($M = 1.625$) received the lowest endorsements. The data are included as Appendix D.

Summary

A repeated measures factorial ANOVA was used to answer the first research question and the associated null hypotheses. A mixed factorial repeated measures ANOVA was used to answer the second research question and the associated null

hypothesis. A univariate ANOVA was used to answer the third research question and the associated null hypothesis.

Research question 1 required a 3 x 3 factorial with grade and year as the variables. Scaled scores for Total Reading, Reading Vocabulary, and Reading Comprehension were analyzed to test the nine null hypotheses for this question. For Total Reading, the interaction between grade and year was significant with a medium ($\eta_P^2 = .063$) effect size. The mean gain scores for Total Reading in each of the three grade levels were greater in Year 3 than in Year 2; therefore, the first three null hypotheses were rejected.

For Reading Vocabulary, the interaction between grade and year was significant with a medium effect size ($\eta_P^2 = .06$). The mean gain scores for Reading Vocabulary for each of the three grades were different. Sixth and eighth grades gained more in Year 2 (17.66, 24.73, respectively) than in Year 3 (7.97, 10.72, respectively) in Reading Vocabulary, while seventh grade gained more in Year 3 (25.65) than in Year 2 (6.30). Therefore, the three null hypotheses associated with reading vocabulary were rejected.

For Reading Comprehension, the interaction between grade and year was significant, with a small effect size of $\eta_P^2 = .054$. The mean gain scores for Reading Comprehension were greater in Year 3 for each of the three grade levels. Sixth grade gained 12.31 points in Year 3 and 0.63 points in Year 2. Seventh grade gained 14.83 points in Year 3 and 11.15 points in Year 2. Eighth grade gained 24.38 points in Year 3 and 6.45 points in Year 2. Therefore, the three null hypotheses for reading comprehension were rejected.

Research question 2 required a 3 x 3 x 2 mixed factorial with grade, year, and percentile as the variables. Scores for Total Reading, Reading Vocabulary, and Reading

Comprehension were analyzed to test the null hypothesis for this question. For Total Reading, the interaction between year, grade, and percentile, was not significant. Despite the lack of statistical significance, the mean gains of the 60th percentile group were higher in Year 3 than the mean gains of the 40th percentile group at each of the three grade levels. The sixth grade 60th percentile group gained 13.26 points, while the 40th percentile group gained 12.80 points. The seventh grade 60th percentile group gained 20.19 points, while the 40th percentile group gained 17.83 points. The eighth grade 60th percentile group gained 27.5 points while the 40th percentile group gained 12 points.

For Reading Vocabulary, the interaction between year, grade, and percentile was not significant. Despite the lack of statistical significance, the mean gains of the 40th percentile sixth and eighth grade groups were higher in Year 3 than the mean gains of the 60th percentile group in Reading Vocabulary. The sixth grade 40th percentile group gained 11 points, while the 60th percentile group gained 10.74 points. The seventh grade 60th percentile group gained 30.05 points, while the 40th percentile group gained 21.33 points. The eighth grade 40th percentile group gained 16.80 points, while the 60th percentile group gained 10 points.

For Reading Comprehension, the interaction between year, grade, and percentile was not significant. Despite the lack of statistical significance, in Reading Comprehension sixth and eighth grades 60th percentile groups gained more than the 40th percentile groups. The sixth grade 60th percentile group gained 15.61 points, while the 40th percentile group gained 14.4 points. The seventh grade 40th percentile group gained 25.83 points, while the 60th percentile group gained 15.57 points. The eighth grade 60th percentile group gained 33.24 points, while the 40th percentile group gained 9.8 points.

The mean gains for the two different percentile groups at each grade level on Total Reading, Reading Vocabulary, and Reading Comprehension were not statistically different. Therefore, the null hypothesis for research question 2 was retained.

A univariate ANOVA was used to answer research question 3 and the associated null hypothesis. Students in each grade were coded according to the results of an interview with their respective classroom teacher. Teachers who indicated six or more of the stacked for success traits were present in their classroom during the SSR period were assigned a code of 1, Traits. Those who indicated fewer than six of the traits were present in their classrooms were assigned a code of 0, No Traits. Five of eight teachers involved in the study indicated six or more of the stacked for success traits were present in their classrooms during SSR.

The main effect for traits was significant, with a medium effect size of $\eta_P^2 = .085$. The interaction between grade and traits was significant, with a small effect size of $\eta_P^2 = .045$. Students who were present in classrooms characterized by six or more of the stacked for success traits experienced statistically significant gains in Total Reading compared to students who were in classrooms which exhibited fewer than six of the traits. Therefore, the null hypothesis was rejected.

Chapter Five: Summary and Discussion

This final chapter begins by restating the problem, reviewing the methodology employed to study the problem, and summarizing the statistical findings. A summary of the results and a discussion of the practical significance of the results follow. Implications for educational practice and suggestions for further research conclude the chapter.

Statement of the Problem

Following a one school-year implementation of twenty minutes of daily SSR, the staff of a middle school desired to determine if the investment of time during the school day significantly increased student reading achievement on the Stanford Achievement Test, Ninth Edition (SAT-9). According to the National Reading Panel (2000) report, the lack of empirical evidence to support the instructional practice of SSR necessitated more studies. For SSR to be embraced as a research-based practice, studies which are replicable and which provide empirical evidence of the effectiveness of SSR are needed (Klump, 2007).

Review of the Methodology

As explained in Chapter 3, this study was an ex post facto using a repeated measures factorial design to compare changes in students' scores on the reading section of the SAT-9. This study was undertaken after the treatment and subsequent testing were completed. The purpose was to determine whether significant differences occurred between achievement scores obtained before and after the implementation of a school-year-long program of SSR.

The study used cluster samples of intact classroom groups in the participating school, all of which were involved in a one school-year implementation of SSR. The SAT-9 was used as the measurement instrument. The reading section of the SAT-9 was composed of two sections, Reading Vocabulary and Reading Comprehension. Together, these sections comprised the Total Reading score.

Interviews with teachers were conducted to determine their level of implementation based on Pilgreen's (2000) eight stacked for success traits. From the responses, teachers were identified with an implementation code of 0 or 1. Zero was assigned where fewer than six of the stacked for success characteristics were exhibited. Those teachers who exhibited six, seven, or eight characteristics were assigned a code of 1. Each student then received a code of 0 or 1 based on the classroom teacher to whom he or she was assigned during the SSR period.

Ninety-three students were studied; 85 were Caucasian, five were African American, and three were Asian. Seventeen students qualified for the free lunch program, and 14 students qualified for reduced price lunch. Fifty were female, and 43 were male.

The mean differences in students' reading scaled scores between the 2006 and 2007 administrations of the SAT-9 were used as the pretreatment measure. The mean differences in students' reading scaled scores between the 2007 and 2008 administrations of the SAT-9 were used as the post treatment measure.

A repeated measures factorial ANOVA was used to answer the first research question and the associated null hypotheses. Scores from the same students across three years were analyzed using a 3 x 3 (Grade x Year) repeated measures ANOVA. For the

second research question, a 3 x 3 x 2 (Grade x Year x Percentile) mixed factorial repeated

measures ANOVA was used. The third research question was answered using a

univariate ANOVA.

For all tests, significance was set at the .05% level. Partial eta-squared ranges

were used to determine effect sizes: small, $.01 \leq \eta_P^2 < .06$; medium, $.06 \leq \eta_P^2 < .14$; large,

$\eta_P^2 \geq .14$.

Summary of the Results

Based upon the statistical analyses conducted to answer each research question,

ten of the eleven null hypotheses were rejected. Overall reading achievement for middle

school students improved following a one school year implementation of twenty minutes

of daily SSR. The degree of implementation varied from classroom to classroom, which

affected the potential scaled score gains of students in the program. Where Pilgreen's

(2000) stacked for success traits were consistently evident, student achievement gains

were greater. No statistically significant differences were found between higher and

lower performing students as they were defined in this study.

The major findings are summarized as follows:

- The mean gain scores for Total Reading in each of the three grade levels
  were greater in Year 3 than in Year 2. Sixth grade gained 10.45 points in
  Year 3 and 6.63 points in Year 2. Seventh grade gained 18.37 points in
  Year 3 and 10.37 points in Year 2. Eighth grade gained 22.27 points in
  Year 3 and 11.84 points in Year 2.

- The mean gain scores for Reading Vocabulary for each of the three grades
  were different. Sixth and eighth grades gained more in Year 2 (17.66,

24.73, respectively) than in Year 3 (7.97, 10.72, respectively) in Reading Vocabulary, while seventh grade gained more in Year 3 (25.65) than in Year 2 (6.30).

- The mean gain scores for Reading Comprehension were greater in Year 3 for each of the three grade levels. Sixth grade gained 12.31 points in Year 3 and 0.63 points in Year 2. Seventh grade gained 14.83 points in Year 3 and 11.15 points in Year 2. Eighth grade gained 24.38 points in Year 3 and 6.45 points in Year 2.

- Following the year of SSR, for Total Reading the mean gains of the 60th percentile group were not statistically different from the mean gains of the 40th percentile group at each of the three grade levels. The sixth grade 60th percentile group gained 13.26 points, while the 40th percentile group gained 12.80 points. The seventh grade 60th percentile group gained 20.19 points, while the 40th percentile group gained 17.83 points. The eighth grade 60th percentile group gained 27.5 points, while the 40th percentile group gained 12 points.

- For Reading Vocabulary, the mean gains of the 40th and 60th percentile groups at each grade level were not statistically different. The sixth grade 40th percentile group gained 11 points, while the 60th percentile group gained 10.74. The seventh grade 60th percentile group gained 30.05 points, while the 40th percentile group gained 21.33 points. The eighth grade 40th percentile group gained 16.80 points, while the 60th percentile group gained 10 points.

- In Reading Comprehension, the 40th and 60th percentile groups at each grade level did not experience significant differences in gains. The sixth grade 60th percentile group gained 15.61 points, while the 40th percentile group gained 14.4 points. The seventh grade 40th percentile group gained 25.83 points, while the 60th percentile group gained 15.57 points. The eighth grade 60th percentile group gained 33.24 points, while the 40th percentile group gained 9.8 points.

- Post treatment scores of students who were present in classrooms characterized by six or more of the stacked for success traits were significantly higher than scores of students who were in classrooms that exhibited fewer than six of the traits.

Discussion

The results of this ex post facto study indicated that SSR contributed to higher reading achievement scores for middle school students. These gains were evident following a school year implementation of SSR. The findings of the present study were consistent with past research, in which having a treatment lasting seven months to one year tended to show more positive results (Krashen, 2004).

Results of Research Question 1. The first question sought to answer whether a year-long implementation of SSR contributed to higher reading achievement in the middle grades. The nine null hypotheses addressed overall reading, vocabulary, and comprehension for each of the three grades (sixth, seventh and eighth). The Total Reading scaled scores from the Stanford Achievement Test, Ninth Edition (SAT-9) were used to answer the first three null hypotheses.

The first three null hypotheses were rejected. The results indicated a significant interaction between grade and year. The mean gain scores for Total Reading in each of the three grade levels were greater in Year 3 than in Year 2. These results showed that overall reading achievement for middle grades students was higher following a school year implementation of twenty minutes of daily SSR.

Not only did these students' scores increase significantly as a result of the treatment, but also they exceeded the national mean gains for their respective levels. The mean scaled score for Total Reading for sixth grade in the studied school in Year 3 was 676.74, which was 15.24 points higher than the national mean for this level of the SAT-9. In Year 3, sixth grade gained 3.82 points more than in Year 2. Likewise, for the seventh grade, the Year 3 mean scaled score for Total Reading was 697.02, a mean score which was 8.52 points higher than the national mean for this level. In Year 3, seventh grade gained 8 points more than in Year 2. Eighth graders in the studied school also performed higher than the national mean by 17.53 points. The eighth grade Year 3 score was 22.27 points higher than its Year 2 score. These findings indicated that seventh and eighth grade achievement in reading increased following the school year implementation of SSR. Although sixth grade did experience a small increase, this gain was not as large as that of the other two grades.

The emphasis on recreational reading and the twenty minutes set aside during the school day for reading was the likely cause of the gains in reading achievement, as the implementation of SSR was a new feature of the curriculum and schedule in Year 3. This finding is supported by previous research as discussed in Chapter 2 (i.e. Lewis and Samuels, n.d.; Krashen, 2004).

For the SAT-9, the Total Reading score was a combination of the Reading Vocabulary score and the Reading Comprehension score. The fourth through ninth null hypotheses addressed these separate areas of reading achievement at each grade level. The Reading Vocabulary scaled score from the SAT-9 was used to answer the fourth, fifth and sixth null hypotheses, which were rejected. The results indicated a significant interaction between grade and year. The mean gain scores for Reading Vocabulary, however, were greater in Year 3 for seventh grade, but not for sixth and eighth grades.

Seventh grade gained 25.65 points in Year 3 as compared to Year 2 gains of 6.30 points; the Year 3 gain was greater than the national mean gain, but the Year 2 gain was lower than the national mean gain. Sixth grade gained just 7.97 points following the treatment, compared to 17.66 points in Year 2; the sixth grade gain was 3.33 points less than the national mean gain for this grade for Reading Vocabulary. Eighth grade gained 10.72 points following the treatment, compared to a gain of 24.73 points in Year 2. Both gains surpassed the national mean gain for each level.

There was an approximately parallel increase in Reading Vocabulary during the seventh grade year for both the seventh grade (25.65) and eighth grade (24.73). For seventh graders, this gain occurred during the treatment, but for eighth graders, this gain occurred in the year prior to the treatment. These score increases were slightly higher than the national mean gain for this level of the test (21.7). These scores suggested vocabulary gains were greatest in the seventh grade year, with or without SSR; therefore, the large gain in seventh grade vocabulary achievement cannot be attributed solely to SSR.

To test the seventh, eight and ninth null hypotheses, the Reading Comprehension

scaled score from the SAT-9 was used. These null hypotheses were rejected. The results indicated a significant interaction between grade and year. The mean gain scores for Reading Comprehension were greater in Year 3 for all three grades. Sixth grade gained 12.31 points in Year 3, compared to a 0.63 gain in Year 2. Seventh grade gained 14.83 points in Year 3, compared to 11.15 points in Year 2, and eighth grade gained 24.38 points in Year 3, compared to 6.45 points in Year 2.

Year 3 scores indicated student achievement in Reading Comprehension increased more in the sixth and eighth grades than the national mean gains, although the seventh grade gain was approximately equal to the national mean gain for that level. Sixth grade gained 3.91 points more than the national gain; seventh grade gained 0.23 points more, and eighth grade gained 10.98 points more.

Following the implementation of SSR, reading comprehension achievement gains for eighth graders were four times greater than their previous gain, and sixth graders gained nearly twelve times their previous gain. Seventh graders increased their comprehension achievement by approximately one-quarter. These findings indicate that SSR significantly affected the reading comprehension achievement of middle school students.

The results of the analysis for the first research question showed significant differences in Reading Comprehension and Total Reading scores in favor of SSR following the implementation of the program in this middle school. Not only were the mean scores for the study sample higher than the national mean scores, but also the study sample scores continued to rise at a higher rate as compared to the national mean gains for each level, leading to the conclusion that reading achievement gains were positively

influenced by SSR.

Results of Research Question 2. The second research question sought to answer whether a year-long implementation of SSR contributed to different gains in reading achievement for lower performing students versus higher performing students. Scaled scores of students who scored at or below the 40th percentile were compared to scaled scores of students who scored at or above the 60th percentile.

There was no statistically significant difference between gains of lower and higher performing students in this study; all of these students experienced gains. Interestingly, students at or below the 40th percentile in all three grades gained fewer points in Total Reading following the treatment than they did in the year prior to the treatment. Conversely, students at or above the 60th percentile in all three grades exhibited large gains in Total Reading in Year 3 following the treatment. For the groups at or above the 60th percentile, Year 3 gains were greater than Year 2 gains (sixth grade: 10.48 points more; seventh grade: 12.48 points more; eighth grade: 28.12 points more). The achievement gains in Total Reading exhibited by the higher performing groups of students were notable, but not statistically significant. Time spent reading during the school day positively affected all of the students in the study, not just one performance level group.

Vocabulary achievement was not positively affected by the treatment for the students at or below the 40th percentile. On the Reading Vocabulary section of the SAT-9, sixth graders at or below the 40th percentile gained half as many points in Year 3 as they did in Year 2. Seventh and eighth graders at or below the 40th percentile gained more in Year 3 than in Year 2, although the eighth grade gain was only 1.2 points more

than the gain in the previous year.

For students at or above the 60th percentile, the sixth and eighth grade groups gained less in Year 3 than in Year 2. Vocabulary achievement for the seventh grade group was positively affected by the treatment; the difference was a 30.05 point gain for Reading Vocabulary. For higher achieving seventh grade students, not only was this vocabulary gain greater than the Year 2 gain, but also it was much greater than the national mean gain for seventh grade vocabulary (+21.7). Consequently, this researcher concluded that SSR had a positive effect on vocabulary achievement of seventh grade high achieving students.

Although Reading Comprehension achievement increased for both the 40th and 60th percentile groups, the gains for the 40th percentile groups were not as high as the gains for the 60th percentile groups. For the groups at or below the 40th percentile, sixth grade comprehension increased 5.8 points more in Year 3 than in Year 2, and seventh grade comprehension increased 2.99 points more in Year 3 than in Year 2. However, the eighth grade group at or below the 40th percentile gained just 9.8 points in Year 3 compared to 29.6 points in Year 2. While these lower performing students experienced some gains in Year 3, they were not as large as the gains of the higher performing students. Again, however, the gain difference between the 40th and 60th percentile groups was not statistically significant.

Following the year of SSR, comprehension scores for higher performing students increased. For the groups at or above the 60th percentile, gains were 15.61, 15.57 and 33.24 for sixth, seventh, and eighth grades, respectively. These gains followed losses of 4.87 for the sixth grade group in Year 2 and 9.50 for the eighth grade group. Because

these students already were performing above the national means, Year 2 scores may be attributed to a regression toward the mean. Following the year of SSR, these scores rebounded and students experienced achievement growth.

The results of this study indicated there were no statistically significant differences between the gains of high and low performing students. This finding may be due, in part, to the unequal numbers of students in each group. The 40th percentile and below groups were very small. Further, the findings for research question 1 indicated gains in achievement were significant for all students. Therefore, both low and high performing students experienced significant gains in reading achievement. This finding differs somewhat from Krashen's (2004) assertion that "SSR works best with less mature readers" (p. 42). In the present study, SSR worked well with students of all levels.

A possible explanation for this finding may be that the boundaries for high and low performing students were too broad. Perhaps the designations used in this study included students who would otherwise be considered medium ability students. After all, Krashen noted a 1988 study by Davis in which "superior gains were made by the medium-ability group" but the results were "not statistically significant for the high-ability readers" (p. 42).

Results of Research Question 3. The results of the analysis for the third question indicated a relationship between high student achievement and an implementation of SSR characterized by Pilgreen's (2000) stacked for success traits. Most striking, was a 37.61 point difference in the mean for seventh grade students ($M =$ 703.61, $n = 33$) who were in a classroom characterized by at least six of the stacked for success traits, as compared to the students ($M = 674.41$, $n = 7$) who were in a *No Traits*

classroom. Sixth graders in a *Traits* classroom ($M = 680.69$, $n = 13$) also scored a few points higher than those in a *No Traits* classroom ($M = 674.41$, $n = 22$). All eighth graders were in a *Traits* classroom ($M = 707.83$, $n = 18$).

The results of this research question also must be considered when interpreting results for the first research question. Pilgreen (2000) noted that six of the eight factors were most consistently present in the SSR programs she studied. Similarly, the mean endorsements for each factor by teachers in the present study indicated these six factors were present always or regularly in their classrooms ($M \geq 3.0$).

After reviewing the results for question 1, this researcher believed two explanations were plausible for the large difference in gains between eighth and sixth grades. First, the high gain for eighth grade (22.27), as compared to sixth grade (10.45) may be attributed to the differences between the typical amount of reading upper elementary students do versus the typical amount of reading middle school students do. NAEP data for 2007 indicated 84% of fourth graders read silently almost everyday compared to 42% of eighth graders who read silently everyday (National, 2009). Prior to the implementation of SSR in this school, middle school students may not have participated in much recreational reading. In fact, lower than desirable reading scores in the years prior to the implementation led to the decision to implement SSR in the school (L. Pinson, personal communication, 2009). Sixth grade students during the study were enrolled in fourth and fifth grades in the years prior to the SSR implementation and thus may have read more recreationally; consequently, their scores may not have shown as great a change as scores of students who had not read extensively during the previous two years. A second explanation for the differences between sixth and eighth grade gains

may be attributable to the differences in implementation of the SSR program in the different classrooms. Research question 3 addressed this difference.

Of particular note was a finding for Total Reading that growth during the sixth grade year was strikingly similar for sixth graders and seventh graders in the study. The gain was 10.45 for sixth graders and 10.37 for seventh graders. For the sixth grade group this gain occurred during the study; however, for the seventh grade group, this gain occurred prior to the SSR implementation. Similar findings occurred for Reading Vocabulary and Reading Comprehension. Vocabulary mean gains for sixth graders were 7.97 and for seventh graders the gain was 6.30; comprehension mean gains for sixth graders were 12.31 and for seventh graders they were 11.15. The first assumption was that SSR had little or no effect on sixth grade reading achievement. However, when considered with the findings for research question 3, which measured the presence of eight characteristics of successful SSR programs, all sixth grade classrooms did not consistently exhibit these characteristics. Thus, SSR was not well-implemented in the sixth grade, which may have stunted potential growth beyond that which was typical for that grade level.

In the present study, 22 sixth grade students participated in SSR in a classroom characterized by fewer than six of the stacked for success traits. Although both classroom teachers of these students endorsed *access to books* with a score of 4 (*factor present always*), their endorsement for *distributed time to read* was 3 (*factor present regularly*). Their endorsement for *encouragement* was 2 (*factor present occasionally*), with responses indicating neither teacher read for pleasure during the SSR period. One teacher indicated the environment was not completely protected from interruptions. The

lack of consistency of these traits in the classroom may have prevented the occurrence of greater than typical gains in sixth grade performance.

Better performance was evident in classrooms where the traits were more consistently present. Although the seventh grade traits group ($M = 703.61$) significantly outperformed the no traits group ($M = 674.41$), the seven students who were in a classroom characterized by fewer than six of the traits, exhibited a mean gain of 26.28 points for Total Reading. In this classroom, access, appeal, conducive environment, and distributed time to read received endorsements of 4 (*factor present always*), and encouragement received an endorsement of 3 (*factor present regularly*). Much like Gardiner (2005), who wrote, "If SSR is truly to be sustained silent reading, everyone, including the teacher, needs to participate for the full time each session. […] Modeling silent reading means I read with them every day, not just when it's convenient to me" (p. 39), this teacher indicated she, too, read for pleasure during the SSR period. In contrast to the sixth grade classrooms, in this seventh grade classroom, the teacher indicated the reading time was protected, and she modeled recreational reading during the SSR period.

Traits receiving endorsements of 4 (*factor present always*) in both eighth grade classrooms were access, non-accountability, and distributed time to read. Conducive environment received a 3 (*factor present regularly*) from both teachers, and encouragement received a 3 (*factor present regularly*) and a 4 (*factor present always*). Similar to the seventh grade classrooms, the reading time was protected, and teachers participated in SSR, as well.

The results generated to answer the third research question indicated the presence of six factors (access, appeal, conducive environment, encouragement, non-

accountability, and distributed time to read) accompanied increased reading achievement. In this study, interviews with the teachers revealed students had adequate access to books through the school library, classroom libraries, and materials brought from home. In classrooms where time to read and a quiet environment were always protected, student gains were high. Based upon these findings, this researcher concluded that the consistent presence of these factors in the classroom accompanied higher gains in student reading achievement.

Conclusions

The findings of this research study were not surprising. In keeping with the findings of previous studies, overall student achievement in reading was positively affected by a school year of daily SSR. Lagging test scores and the knowledge that students at the school "were not becoming readers" were the impetus for the administrative decision to implement SSR (L. Pinson, personal communication, 2009). Previous research indicating the benefits of SSR in improving student achievement led to the implementation of the program. Because student achievement increased, the program was deemed successful within the school.

The similarities between scores of different groups of students during their year in the same grade were noticeable. These similarities suggested that the SSR program was not fully embraced by all teachers and students in the middle school, resulting in lower gains in that grade. In light of these findings, teacher training on the benefits of a stacked for success SSR program and how to effectively implement such a program could strengthen the program in future years.

The decision of the National Reading Panel (2000) to reject SSR as a research-

based practice remains a concern. The findings of this study should not be interpreted to use SSR as a replacement for reading or literature instruction. Rather, SSR should be a supplement to effective reading and literature instruction, though not necessarily relegated to the language arts classroom. Reading is an important skill in all subject areas, and teachers across the curriculum should be encouraged to participate in a school-wide implementation of a stacked for success SSR program.

Furthermore, consumers of this research should be aware that the greatest gains in overall reading achievement occurred in classrooms where teachers indicated that reading time occurred daily and was protected from interruptions. Consequently, an extended period once or twice a week may not provide comparable results.

Implications for Practice

This program of SSR began in the Fall of 2007 in this middle school following an informal analysis of achievement test scores by school personnel. Student scores appeared to have flattened or regressed; school administrators felt that students were not engaged in recreational reading, nor did students read much assigned material (L. Pinson, personal communication, 2009). In short, middle grades students did not practice reading.

Twenty minutes of the school day were scheduled for SSR. Students were to report to their third period class for SSR. A few guidelines were provided to teachers at the onset. It was suggested that teachers ensure students had reading material available each day, that they not require or grade any responses for pleasure reading, and that they, too, spend the time reading (L. Pinson, personal communication, 2009).

The time scheduled for SSR did not reduce the instructional time for any other

classes. SSR was an addition to the curriculum; it did not replace reading instruction. The results of this study indicated that students experienced reading achievement gains at each of the three grade levels following the implementation of the SSR program.

Middle schools seeking to improve reading achievement should engage in a program such as this one which was conducted in addition to the curriculum, not as a replacement for reading instruction. In much the same way as athletes practice their sports day after day in preparation for the big game, in this era of accountability, students need daily practice in reading to be prepared for their big game, the standardized achievement test. Not only do athletes prepare for the game, but their bodies become physically fit in the process. Likewise, students who read often become academically fit.

More specific training for teachers may also improve the degree to which the SSR program is implemented in the classroom. Training teachers in how to match students with books is one example. Sharing research data to show teachers the importance of their participation in SSR and the benefits their students may gain from the program may increase the likelihood of higher student achievement as a result of participation in an SSR program. In schools where SSR is implemented, school-wide announcements and other disruptions during the reading period should be eliminated.

The availability of a wide range of books appropriate for students in the middle school is a requirement of a well-implemented stacked for success SSR program. Schools wishing to implement such a program should consider additional funding for the library and for classroom library collections.

Limitations

As a full-time employee of the school where this study was conducted, this

researcher was responsible for the recommendation to the Administrator to implement SSR in the school. However, she did not conceive the idea for this ex post facto study until the latter part of the 2007-2008 school year, approximately six months after the SSR program began, and the gathering of data did not begin until 2009.

In the Fall of 2009, the researcher interviewed the eight teachers whose students were the subjects of the study. The teachers and the researcher were co-workers. The researcher's role at the school was administrative in nature, and consequently, teachers may have felt compelled to participate in the study or to provide inflated responses. The researcher followed appropriate protocol, receiving permission of the Administrator to conduct interviews with teachers. She provided teachers with a consent form and the option not to participate in the study with no penalty if they chose; all teachers willingly responded to the survey questions.

The interviews were conducted approximately one and a half years after the conclusion of the 2007-2008 school year in which the SSR program was first implemented. Teachers were asked to recall their implementation from that school year; consequently, their responses to the survey were based on their perceptions of the presence of each factor. The school continued to have SSR in 2008-2009 and in 2009-2010, so the teachers were already involved in their third year of SSR when the interviews occurred. This time delay may have affected teachers' recall of the particular characteristics present in their classrooms during the study.

The school library had a limited supply of young adult novels. The small, and in some cases, nonexistent, classroom collections in the school also may have limited the availability of reading material for students, resulting in the reading of fewer books than

may have otherwise occurred.

Because this study was an ex post facto study, no experimental controls were in place during the year in which students participated in SSR. SSR was the only known change in the curriculum at the school during that period of time. While this lack of control was a limitation of the study, the results were the real student achievement results obtained by real students in a real school; these were not lab results.

Furthermore, the population from which this study derived its participants may have had unknown characteristics which may have affected the outcome of the study. The study was conducted at a charter school. Enrollment in the school was dependent upon parental choice, available classroom slots, and residence within the primary or secondary attendance zone. Parents also were required to honor a volunteer service agreement and family contract in support of the school's mission.

This study sought to measure academic achievement only. Educators are well aware of the many benefits of self-selected reading beyond test scores. Those benefits are perhaps much greater, and more important, than what has been reported in this study. However, the reporting of additional benefits was beyond the scope of this study.

Recommendations for Future Research

Many of the studies reviewed prior to conducting this research covered brief time spans, such as six, eight, or twelve week implementations of SSR. The present study measured gains over the course of a school year. More long-term studies such as this could add to the research body and aid educators in determining whether to implement such a program in their respective schools. Studies of other groups of students replicating this study could be beneficial for this purpose.

Additionally, a follow-up study on the same students as they participated in a second and third year of SSR at the school could provide additional data on the long-term effects of SSR on student achievement. After providing staff training on Pilgreen's (2000) stacked for success traits and sharing the findings from this study, a follow-up study focusing on the effects of the various traits on student achievement would yield additional information in this area.

Having students keep a reading log of the number of books and pages read during SSR would allow for a study of the relationship of the amount of actual reading each student does to individual achievement gains. Like Gardiner's (2005) running records, a reading log could serve as an encouragement as students see their progress. Any efforts to have students keep records of their reading must be carefully designed to prevent reading from becoming an assignment and to prevent students from inflating their reading accomplishments. A researcher undertaking this avenue must be mindful of the non-accountability factor in successful SSR programs.

Any of the quantitative studies suggested here could be enhanced with the addition of qualitative data from students regarding their interests and habits in reading as a result of the time spent in SSR. Because one of the goals of SSR is to create enjoyment which will lead to lifelong reading habits for students, qualitative data can provide important insights for the implementation and continuation of SSR.

Summary

These findings support the inclusion of SSR as a daily component of the middle school curriculum. These findings further suggest that teacher training focused on the stacked for success traits of successful SSR programs could strengthen the program.

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Appendices

Appendix A

Letter of Request to Conduct Study

Administrator's Response

IRB Approval

211 S. GA Hwy. 3
Baconton, GA 31716
March 18, 2009

██████████████████
████████████

Dear ████

      As an Ed.D. candidate at Liberty University, I am requesting permission to conduct a study of the sustained silent reading program in the middle grades at ████ for the 2007-2008 school year to answer the research question, "Is a program of sustained silent reading correlated with higher reading achievement scores in the middle grades?" This research will form the basis for my doctoral dissertation.

      For this study, I will need to access student scores on the Stanford Achievement Test for the years 2006, 2007, and 2008 for students who were enrolled in sixth, seventh or eighth grade in 2007-2008. I will also need to categorize students based on the teacher to whom they were assigned during the SSR period. To do this, I will need to review questionnaires the teachers completed at the end of the school year, and I will also need to conduct interviews with these teachers to gather additional information.

      To protect the confidentiality of both students and teachers, names will be concealed.

      My research will be conducted under the direction of Liberty University professor Dr. Carol Mowen as committee chair, with Dr. Mark Angle and Dr. Joy Tabb as committee members.

      Following completion of the study, I will provide you with a copy of my findings.
Thank you for your consideration of this request.

      Sincerely,

      Mary Sullivan

May 21, 2009

Dear Mary:

You are granted permission to use our students' scores to conduct research on the sustained silent reading program in our middle school. The questionnaires that were collected at the end of 2007-2008 from teachers may also be used.

In addition, you may request voluntary interviews from each of the teachers who supervised DEAR during 2007-2008.

Sincerely,

████████

Administrator

Institutional Review Board Approval

IRB Approval 714.052709: Achievement Effects of Sustained Silent Reading in a Middle School

Monday, July 13, 2009

Dear Mary,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. Attached you'll find the forms for those cases.

Thank you for your cooperation with the IRB and we wish you well with your research project. We will be glad to send you a written memo from the Liberty IRB, as needed, upon request.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Liberty University
Center for Counseling and Family Studies Liberty University
1971 University Boulevard
Lynchburg, VA 24502-2269
(434) 592-4054
Fax: (434) 522-0477

Appendix B

Guided Survey Interview Script

Script for Interviews for SSR project:

The researcher will read each description and the questions that follow, then mark the participants' responses.

For my dissertation, I am studying the achievement effects of sustained silent reading in our middle school during the first year of implementation, 2007-2008. After much reading about successful SSR (or DEAR as we call it) programs, I have discovered eight factors that may be present in SSR programs in schools. As a teacher who implemented DEAR in your middle school classroom, your responses to this survey will help us determine the extent to which SSR was implemented in our school. Because this is a research study for my dissertation, your participation is voluntary. Here is an informed consent request for you to review and sign if you are willing to participate in my research. *(Give the participant the form, allow time for the participant to read and ask questions as necessary before signing, and then continue with the interview as scripted below)*

As I describe each factor, please indicate, using a scale of 1-4, the extent to which this factor describes the implementation of the program in your classroom during 2007-2008.
 1 = factor never present   2 = factor present occasionally
3 = factor present regularly   4 = factor present always

Then answer the yes or no questions and provide additional details

Interviewee _____ **Date** _____

Factor One: Access   1   2   3   4
        Access is about getting reading materials into the hands of students; you did more than tell students they must bring their own book to read. You had ample books available in your classroom from which students could select, and you encouraged students to visit the library in advance of DEAR.
        For example, "trade books, magazines, comics, newspapers, and other reading materials were provided directly to the students in a variety of ways instead of requiring the students to bring something from home to read."
        "The burden did not fall upon the readers to locate their own reading materials outside of school."

Was reading material available in your classroom for your students? Yes   No
   Estimate the number of reading materials per student available in your classroom: _____

Did you provide opportunities for students to visit the library?   Yes   No
   Estimate the number of times per month students visited the library: _____

Were students required to bring their own reading material to class without any assistance from the teacher?   Yes   No

Factor Two: Appeal   1   2   3   4

       The reading materials you provided for students matched their varied interests and reading abilities. They were "classroom appropriate." You asked students about their reading interests and sought to provide materials that would appeal to them

       "Reading materials are sufficiently interesting and provocative enough for students to want to read them. A crucial element of book appeal is self-selection, or the opportunity for students to choose what they want to read regardless of the teacher's preferences (though always with 'classroom appropriate' guidelines in mind)."

       Paperbacks are more tempting than hardbound books for students and effective book displays entice students to read.

Were students allowed to self-select from a variety of reading material? Yes   No
Were paperback books available? Yes   No
Were books displayed in the classroom?   Yes   No

Factor Three: Conducive Environment   1   2   3   4

       The classroom was physically comfortable for students during DEAR. You allowed students to sit in places other than their desk if they chose. You insured that the room was quiet and uninterrupted during DEAR.

Was the environment quiet and protected from interruptions?   Yes   No
Were students required to remain in their desks during DEAR? Yes   No
Were student allowed to work on homework or other assignments during DEAR? Yes   No

Factor Four: Encouragement   1   2   3   4

       You encouraged students to read by sharing your love of reading with them. You often discussed with students the books they were reading and provided opportunities for students to share with each other. You also read books during DEAR to model pleasurable reading.

Did post-reading book sharing or discussions occur regularly in your room? Yes   No
Did you read for pleasure during the DEAR period? Yes   No

Factor Five: Staff Training   1   2   3   4

       Do you feel that you received adequate training in DEAR, including how to match students with books, how to generate appeal for reading, appropriate classroom climates for independent reading and how to provide follow-up activities for students?

Did you receive staff development training in how to implement a successful DEAR program? Yes   No
Did you conduct your own personal learning study to implement DEAR in your classroom? Yes   No

Factor Six: Non-Accountability   1   2   3   4

       You allowed students to stop reading books they were not interested in and select a new book rather than insisting they read books they didn't like. You did not require students to take tests, write essays, or keep a detailed reading or response log related to their independent reading.

       As one researcher says, "The key to non-accountability . . . is to omit any activity that gives students the message that they are responsible for completing a task, comprehending a particular portion of their reading, or showing they have made improvement in some way."

       Some teachers use a reading record to have students record the number of pages they have read; this is not considered to violate the "non-accountability" factor.

Were students allowed to discontinue a book if they wanted to? Yes   No
Were students required to complete a graded assignment following the reading of a selection?   Yes   No
Were students required to complete a reading record of some type each day? Yes   No
Did this reading record require more response than a listing of page numbers? Yes   No

Factor Seven: Follow-up Activities   1   2   3   4

       You provided opportunities for students to share their reading experiences with others, possibly through book sharing, role plays, projects, or other creative means. These activities were not evaluated for a grade

       "Follow-up activities . . . are typically interactive in nature and offer opportunities for readers to channel their enthusiasm in creative and thoughtful ways" but do "not include any components that readers may view as accountability measures."

Did your students engage in follow-up activities such as book discussions, art, music or theatrical expressions or other activities that extended their enjoyment of reading?
   Yes   No

Factor Eight: Distributed Time to Read   1   2   3   4

       I provided 15-20 minutes of sustained silent reading time in my classroom on a daily basis.

Were students given fifteen to thirty minutes of reading DAILY? Yes   No
   If no, how many days per week were students given DEAR time? _____

Reference: Pilgreen, J. L. (2000) *The SSR Handbook: How to Organize and Manage a Sustained Silent Reading Program.*
      Portsmouth, NH: Boynton/Cook Publishers.

Appendix C

Consent to Participate

CONSENT FORM

Achievement Effects of Sustained Silent Reading in a Middle School
Dissertation Research
Mary Pinson Sullivan
Liberty University
College of Education

You are invited to be in a research study of sustained silent reading. You were selected as a possible participant because you were a middle school teacher at Baconton Community Charter School in 2007-2008 who supervised DEAR (DEAR is the acronym used for the sustained silent reading program at Baconton Community Charter School). We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Mary Pinson Sullivan, Liberty University Graduate Student under the supervision of Dr. Carol Mowen, Liberty University Faculty.

Background Information

The purpose of this study is to determine if there are measurable effects of sustained silent reading on middle school reading achievement on the Stanford Achievement Test, Ninth Edition. Further, the study will attempt to determine if particular characteristics of a sustained silent reading program affected student achievement in reading.

Procedures:

If you agree to be in this study, we would ask you to do the following things:
1. Participate in a brief, individual interview with the principal investigator to answer questions concerning the characteristics present in your classroom during DEAR in 2007-2008.
2. Attempt to identify and give consent to use a questionnaire you completed for the school at the end of the 2007-2008 school year for the purpose of allowing the researcher to use your responses in the study.

Risks and Benefits of Being in the Study

The study has several risks. First, your responses will be identifiable by the principal researcher who also is an employee of Baconton Community Charter School where you are (or were) employed. Second, findings from this research may be used to inform curriculum decisions by the Administrator of this school which could affect your job requirements. It is expected that these risks are minimal and no more than one would encounter in everyday life.

The benefit to participation is better informed curriculum planning at Baconton Community Charter School. Findings may be used by the school to conduct professional development training to improve the program, and thus, increase student achievement.

Compensation:

You will receive no payment or compensation for participation in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Questionnaires used for this study will remain the property of Baconton Community Charter School and will be kept on file for a minimum of three years following the date of this study, after which time the school may elect to keep or destroy them.

Interview transcripts will be kept secure by the researcher for a minimum of three years, after which time they may be destroyed.

Data collected in this study may be used for future research.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or with Baconton Community Charter School or with the researchers.   If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researchers conducting this study are: Mary Pinson Sullivan and Dr. Carol Mowen (Liberty Faculty and Dissertation Chair). You may ask any questions you have now. If you have questions later, **you are encouraged** to contact them at 260 E. Walton St., Baconton, GA 31716, 229-343-2016, sullivan884@juno.com or cmowen@liberty.edu., 270-982-9231.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Institutional Review Board, Dr. Fernando Garzon, Chair, 1971 University Blvd, Suite 2400, Lynchburg, VA 24502 or email at fgarzon@liberty.edu.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature:_____Date: _____

Signature of Investigator:_____ Date: _____

Appendix D

Interview Results

1 = factor never present
2 = factor present sometimes
3 = factor present regularly
4 = factor present always

Teacher/Grade Level	Access	Appeal	Conducive Environment	Encouragement	Staff Training	Non-Accountability	Follow-up Activities	Distributed Time to Read	Total Traits Endorsed with 3 or 4	Traits Code Assigned
1/6th	4	3	3	2	1	4	1	3	5	0
2/6th	4	2	3	2	2	3	1	3	4	0
3/6th	4	4	3	3	3	4	4	4	8	1
4/7th	3	3	4	3	4	4	3	4	8	1
5/7th	4	3	4	4	4	1	1	4	6	1
6/7th	4	4	4	3	1	2	1	4	5	0
7/8th	4	1	3	3	3	4	1	4	6	1
8/8th	4	4	3	4	4	4	1	4	7	1
Average	3.875	3.0	3.375	3.0	2.75	3.25	1.625	3.75	6.125	

Appendix E

Data

Gr	Traits Code	SSRC6	P-RC6	SSRC7	P-RC7	SSRC8	P-RC8	SSRV6	P-RV6	SSRV7	P-RV7	SSRV8	P-RV8	SSTR6	P-TR6	SSTR7	P-TR7	SSTR8	P-TR8
6	1	663	71	662	60	660	49	638	49	657	51	665	49	655	67	660	57	662	49
6	0	684	85	673	69	701	85	655	63	682	74	688	71	674	80	676	72	696	81
6	0	623	26	662	60	660	49	625	24	682	74	665	49	624	23	668	65	662	49
6	0	673	78	695	85	721	94	678	78	693	80	764	98	674	80	695	86	733	97
6	0	684	85	690	81	707	89	638	49	657	51	680	64	667	76	679	74	696	81
6	1	668	75	652	50	650	39	655	63	664	58	688	71	664	73	656	53	662	49
6	0	636	49	658	56	657	46	617	32	682	74	665	49	630	42	665	62	660	47
6	0	699	91	669	66	707	89	695	85	673	67	688	71	697	92	670	67	700	84
6	1	760	99	706	92	701	85	678	78	706	85	697	77	720	97	706	91	700	84
6	0	633	46	623	27	607	10	624	38	631	29	616	10	630	42	626	25	610	8
6	0	640	53	652	50	660	49	638	49	637	33	680	64	639	51	647	44	666	53
6	1	643	56	662	60	638	29	655	63	657	51	640	26	647	59	660	57	639	26
6	1	630	43	633	34	667	56	638	49	643	38	640	26	632	44	636	33	657	44
6	1	647	59	673	69	660	49	695	85	706	85	697	77	658	69	681	76	671	58
6	1	684	85	713	94	714	92	638	49	682	74	680	64	667	76	702	89	700	84
6	1	663	71	677	72	686	74	638	49	664	58	659	43	655	67	673	70	676	63
6	0	678	81	636	36	660	49	646	56	673	67	720	88	667	76	647	44	676	63
6	0	601	22	573	3	614	13	624	38	631	29	652	36	609	25	597	8	627	18
6	0	663	71	681	75	678	67	631	43	664	58	720	88	652	64	676	72	690	77
6	0	651	62	662	60	670	59	655	63	673	67	697	77	652	64	665	62	679	66
6	0	668	75	685	78	667	56	646	56	682	74	665	49	661	71	685	79	666	53
6	1	708	94	673	69	707	89	746	98	693	80	720	88	720	97	679	74	711	91
6	1	684	85	677	72	721	94	695	85	723	91	697	77	687	87	688	81	711	91
6	0	610	28	617	23	650	39	605	24	619	20	628	18	609	25	618	20	643	30
6	0	617	22	617	23	617	15	577	2	631	29	646	30	603	10	622	22	627	18
6	0	668	75	681	75	686	74	678	78	693	80	672	56	671	78	685	79	681	68
6	0	719	96	695	85	707	89	721	94	723	91	737	93	720	97	702	89	716	93
6	0	691	88	662	60	730	96	721	94	682	74	697	77	697	92	668	65	716	93
6	0	582	5	607	16	607	10	625	24	607	12	634	22	599	5	607	13	617	12
6	1	673	78	690	81	707	89	665	70	682	74	672	56	671	78	688	81	693	79
6	0	663	71	685	78	686	74	631	43	664	58	659	43	652	64	679	74	676	63
6	1	659	68	645	43	660	49	611	28	650	44	634	22	642	54	647	44	651	38
6	1	699	91	695	85	701	85	695	85	750	97	764	98	697	92	706	91	716	93
6	0	643	56	662	60	674	63	665	70	693	80	688	71	649	61	670	67	679	66
6	0	699	91	685	78	721	94	695	85	706	85	720	88	697	92	691	83	721	94
7	1	662	59	714	92	700	73	664	57	737	93	739	84	663	59	721	94	712	79
7	0	652	49	638	29	670	44	693	79	652	36	675	38	663	59	643	30	672	41
7	1	706	91	805	99	721	88	750	97	764	98	756	90	716	95	799	99	732	91
7	1	713	94	714	92	721	88	775	99	708	82	783	97	728	97	711	91	737	93
7	1	669	66	667	56	700	73	650	43	665	49	705	64	663	59	666	53	702	71
7	1	662	59	663	52	677	52	650	43	652	36	705	64	658	54	660	47	686	55
7	1	685	78	691	78	736	94	750	97	737	93	756	90	698	87	703	86	743	95
7	1	706	91	721	94	756	98	750	97	720	88	783	97	716	95	721	94	765	99
7	1	662	59	667	56	684	58	693	79	697	77	739	84	670	66	676	63	699	68
7	1	677	72	701	85	721	88	706	85	680	64	725	78	685	78	693	79	723	86
7	1	636	35	701	85	700	73	693	79	688	71	705	64	651	47	696	81	702	71
7	0	655	52	657	46	661	36	650	43	640	26	662	28	653	49	651	38	661	31
7	1	669	66	657	46	715	84	682	73	672	56	705	64	673	69	662	49	712	79
7	0	665	62	660	49	684	58	643	37	672	56	715	72	658	54	664	51	694	63
7	1	677	72	730	96	710	81	693	79	708	82	739	84	681	76	721	94	719	84
7	0	639	38	644	34	677	51	650	43	665	49	689	50	642	38	651	38	681	50
7	0	669	66	610	12	664	38	637	32	640	26	705	64	658	54	621	14	677	46
7	1	681	75	657	46	651	28	723	91	672	56	715	72	691	82	662	49	670	39
7	1	663	52	653	42	688	62	652	36	672	56	675	38	660	47	660	47	684	53
7	1	636	35	650	39	674	48	631	28	659	43	697	58	634	30	653	40	681	50
7	1	630	31	610	12	629	14	625	24	652	36	668	32	628	26	625	17	643	18
7	1	653	42	707	89	692	66	640	26	646	31	662	28	649	36	681	68	681	50
7	1	655	52	670	59	700	73	657	50	708	82	739	84	656	52	681	68	712	79
7	1	685	78	653	42	705	77	673	66	737	93	739	84	681	76	674	61	715	81
7	1	690	81	721	94	736	94	706	85	737	93	783	97	695	85	726	96	749	97
7	1	652	49	657	46	667	41	664	57	659	43	682	43	656	52	657	44	672	41
7	1	685	78	653	42	670	44	664	57	697	77	705	64	679	74	666	53	681	50
7	1	681	75	714	92	721	88	693	79	697	77	725	78	685	78	707	89	723	86
7	1	685	78	730	96	728	92	682	73	720	88	725	78	685	78	726	96	727	89
7	1	669	66	701	85	715	84	723	91	697	77	705	64	681	76	700	84	712	79
7	1	658	55	691	78	696	70	682	73	697	77	705	64	665	61	693	79	699	68
7	1	673	69	682	70	696	70	682	73	708	82	705	64	676	72	690	77	699	68
7	1	658	55	663	52	677	51	643	37	628	18	650	20	653	49	651	38	668	37
7	1	648	45	678	67	688	62	650	43	665	49	689	50	649	45	674	61	689	58
7	1	645	42	597	6	626	13	643	37	646	31	644	16	645	41	615	11	632	12
7	1	673	69	707	89	710	81	693	79	697	77	697	58	679	74	703	86	705	74
7	1	636	35	682	70	692	66	673	66	680	64	697	58	647	43	681	68	694	63
7	1	681	75	647	36	670	44	657	50	672	56	715	72	673	69	655	42	684	53
7	1	673	69	670	59	688	62	706	85	680	64	725	78	681	76	674	61	699	68
7	0	614	20	641	32	651	28	596	7	616	11	632	10	607	12	633	22	645	19
8	1	667	56	684	59	696	57	652	36	675	38	723	71	662	49	681	51	729	84
8	1	714	92	728	92	739	91	764	98	697	60	747	84	726	96	715	82	742	90

8	1	670	59	651	29	712	73	672	56	705	66	734	78	671	58	668	38	719	76
8	1	714	92	728	92	739	91	720	88	756	91	791	96	716	93	737	94	752	94
8	1	707	89	677	52	732	87	665	49	725	79	723	71	690	77	691	61	729	84
8	1	660	49	684	59	726	83	708	82	725	79	723	71	674	61	697	67	726	82
8	1	678	67	645	24	693	54	708	82	783	97	685	40	687	74	674	44	690	49
8	1	641	32	674	49	686	47	680	64	715	73	685	40	653	40	686	56	686	45
8	1	635	27	664	39	634	10	634	22	656	24	660	22	635	23	661	32	643	12
8	1	647	36	674	49	683	44	659	43	689	52	706	58	651	38	679	49	690	49
8	1	638	29	674	49	700	61	646	30	656	24	691	45	641	28	668	38	697	56
8	1	686	74	674	49	716	76	672	56	682	45	698	51	681	68	677	47	710	69
8	1	686	74	674	49	712	73	688	71	689	52	706	58	687	74	679	49	710	69
8	1	653	42	667	42	667	30	640	26	715	73	685	40	649	36	681	51	673	32
8	1	641	32	664	39	696	57	708	82	689	52	747	84	660	47	672	42	710	69
8	1	701	85	670	45	726	83	672	56	697	60	734	78	690	77	679	49	729	84
8	1	707	89	721	89	726	83	708	82	739	85	764	90	707	89	727	89	737	88
8	1	653	42	661	36	670	32	634	22	682	45	666	26	647	34	668	38	669	29