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A Case Study Examining the Reading and Study Habits of Gifted Readers in the Context of Deep Reading

John William Bradford
Kennesaw State University

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A CASE STUDY EXAMINING THE READING HABITS
AND SELF-REGULATED STUDY HABITS OF GIFTED READERS
IN THE CONTEXT OF DEEP READING

by

John William Bradford

A Dissertation

Presented in Partial Fulfillment of Requirements for the

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In

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The dissertation of

John William Bradford

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CANDIDATE NAME/KSU ID

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DISSERTATION CHAIR SIGNATURE

6-5-12
DATE


COMMITTEE MEMBER SIGNATURE

June 5, 2012
DATE


COMMITTEE MEMBER SIGNATURE

6-5-2012
DATE

COMMITTEE MEMBER SIGNATURE

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DEDICATION

I dedicate this dissertation to my parents, Richard and Betty Sue Bradford. Their selfless devotion to my life through the years has made this journey possible. I would not be who I am today without them, and for that I will always be grateful.

ACKNOWLEDGEMENTS

A hero's journey in fiction is not possible without the help of others. What this teaches us and what I firmly believe is that we cannot successfully make any journey alone, and we need the help, support and insight of others to guide us along. My journey on this project was no different, and I would like to acknowledge the ones who have helped me complete this dissertation.

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Finally, I would like to acknowledge my fellow teachers at the high school where I teach. They helped me, encouraged me, and listened to me when the times got rough, and I would not have made it to the end without their support.

ABSTRACT

A CASE STUDY EXAMINING THE READING HABITS AND SELF-REGULATED STUDY HABITS OF GIFTED READERS IN THE CONTEXT OF DEEP READING

by

John Bradford

New debates have been increasing about how technology is rewiring the infrastructure of the brain, especially among today's teenagers who have grown up with computers. One of these debates concerns deep reading, a concept that stresses the brain's need to concentrate undistracted on one thing at a time in order to maximally process and synthesize new material. One side argues that a computer with its dynamic interactions and multitasking demands robs teenagers of the ability to deep read and, as a consequence, disables the brain from properly developing and maturing. Another side argues that the very act of multitasking and interacting with a computer's dynamics enables the brain to grow and mature in better ways than before. This qualitative case study closely examined the reading and study habits of four gifted readers, academically among the most successful in school, for two weeks. Findings show that each student practiced *Three Common Cores of Control* when they studied immediately prior to a test or project. All four students (1) needed to study in isolation in a Most Restrictive Study Environment, (2) needed absolute quiet or music to study in an Artificial Environment, and (3) needed to eliminate or sharply curtail all interaction with technology in a Retro Environment. This study found that deep reading was a part of each student's success, and the implications

are that each student must employ the Three Common Cores of Control to be the most successful. More research is needed in the area of deep reading to determine if the Three Common Cores of Control are prevalent among a greater number of gifted readers. In addition, deep reading practices or lack thereof need to be examined further with students of average ability or those with special needs.

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ZITS

BY JERRY SCOTT AND JIM BORGMAN



CHAPTER I

INTRODUCTION

The above comic strip from *Zits* aptly encapsulates a debate concerning two possible directions technology is taking today's youth. They are either becoming a smarter, multitasking people who will be more knowledgeable thanks to the abundance of information in the Information Age, or they are becoming a less intelligent, less focused people whose overstimulated brains are unable to read deeply and comprehend the abundance of information prevalent in today's computerized society.

The strip reminds me of a situation I encountered with a teenager I mentored several years ago. I arrived at his house to take him to a school event, and I saw him in much the same pose as the character above, working from an old laptop I had given him, engaging in eight different Instant Messaging exchanges with eight different friends; I sat on a couch opposite him, observed in fascination, open mouthed, as he effortlessly kept up with the conversation threads that were popping on the screen like mushrooms. I asked him if he knew what he was

saying to each of them, and whether he got them mixed up, and he replied with some indignation that he most certainly could keep up with them and intimated such a thing was tantamount to calling him stupid.

Thus was born my fascination with technology's impact on today's students. In my former corporate life during the 1990's, I was assigned with installing and advising our personnel on new-fangled PC's, I became intrigued by technology and how it was changing the way people work and play. Entering the teaching profession in 2001, I naturally resolved to incorporate as much technology into my classroom instruction as possible because I knew how much a part of my students' professional and personal lives computers were to become. Therefore, I threw myself into my own learning, absorbing as much information on how to teach with technology as I could; I wanted to engage my students and better prepare them for their futures.

I have found, however, that not all my students have embraced technology, and some have been surprisingly uncomfortable with it. I often find myself schooling my students on how to use the software more than how to apply it to such literary classics as *The Crucible*, *The Scarlet Letter*, *Romeo and Juliet* and *Hamlet*. After a couple of years of such exercises, I began scratching my head and wondering what my purpose was here: to teach them to better use a software program, or to deepen their understanding and appreciation of literature by encouraging them to read more advanced texts. I became convinced that my students were walking away with a misunderstanding of both.

The Not So-New Debate

As I was questioning my own attempt to incorporate technology into my curriculum, I also began to hear debates among my colleagues about the brain's ability to multitask and learn when distracted by the many features so commonplace on today's home computers. Mainstream books offered evidence that the brain is not capable of multitasking; it can only partially task (Carr, 2010). Learning is not as comprehensive when reading from a computer (Wolf, 2007).

In reality, however, this new debate is not new. When writing began to become commonplace in ancient Greek societies, Socrates felt the printed word would limit a person's intelligence and enable him to understand only the surface meaning of writing as opposed to the deep reflection of oral skills. While Plato was somewhat ambivalent, Aristotle was firmly entrenched in the belief that the printed word should serve to deepen understanding and make this understanding available to more people (Wolf, 2007; Federman, 2010).

Dr. Mark Federman (2010) has outlined many such cultural clashes that ensue when society confronts such a new concept:

Roughly speaking, it takes about three hundred years for the foundational knowledge ground of a culture to change its conception of what is valued as knowledge, who decides what is valued as knowledge, who controls access to the knowledge itself, and who controls access to those controls... Moreover, it almost is understood that we should expect a period of maximal disruption to society and culture to occur at roughly the halfway point through the three hundred year nexus period. Roughly at the point where Plato spoke about banning poets and sophists, yet decried the demise of wisdom.

Roughly at the peak of the religious wars of sixteenth and early seventeenth century Europe. Roughly where we are right now (p. 7).

One side of the debate posits that in the modern era, our short-term memory becomes clogged with too many distractions from computers that prevent the brain from filtering the information into our long-term memories, and true learning cannot take place. The brain's development has been mapped out to pre-civilized days in which the brain needed to focus on one idea in order for the human species to survive, and multitasking is not only detrimental but physically impossible (Carr, 2010; Cornish, 2010; Wolf, 2007). Carr (2010) admits that in order to write his book, *What the Internet is Doing to Our Brains: The Shallows*, he had to discontinue his cell phone service, his cable service, and his internet service until he finished his manuscript because he could not concentrate otherwise. A theory of deep, undistracted reading began to emerge (Wolf, 2007): the only way for the brain to accommodate the learning process is to focus solely on the reading, filling short-term memories to the capacity, and filtering this information into long-term memory, where true learning and synthesis occur (Klingberg, 2009; Carr, 2010; Colvin, 2008; Gladwell, 2008). Thus, I began to think I was overloading my students' short-term memory when I had them work on a technology-based project to assess their understanding of literature, a process that impeded their cognitive development.

To borrow a phrase from Coach Corso: "Not so fast, my friend! Not so fast!" (Corso, 2011). They decry the results of brain studies research, citing that it is a new field and inaccurate because they find it is based on pure speculation. The brain can only be studied *in vivo*, not within its natural environment, and any conclusions as to what is actually happening within the brain are based on speculation. Today's students, also known as *Digital Natives*

because most grew up with a computer at their fingertips, are learning to adapt, multitask, and synthesize more information than any previous generation (Tapscott, 2009; Hruby, 2011, 2009).

As the debate takes place in the 21st century, scholars express the same concerns when writing first appeared on the horizon. The caution that Socrates articulated about the written word parallels the caution Wolf and Carr have articulated about digital reading and overstimulated brains; Plato's uncertainty equals that of Klingberg's; and Aristotle's optimism about the written word parallels Gee and Tapscott's belief that digital media will deepen and make the greater knowledge commonplace.

Statement of the Problem

At the center of this debate is the study of technology's impact on the brain, a concept not relevant to the ancient Greek world, and these new studies are generating research into a centuries old paradigm. Ironically, technology has improved the field of brain studies, but the process of knowledge acquisition can only be determined from studying people in their natural environments bereft of the intrusion factor generated by technology itself. Most of today's high school students have grown up with computers, and, indeed, most of them know of no other world in much the same manner as the previous generation could not comprehend a household without a television set. This debate—the use or misuse of computers as an aid to cognitive development in learning—stimulated my desire to explore the reading and studying habits of high school students who have been assessed as gifted readers.

If the studies of Wolf (2007) and Carr (2010)—the Socrates of today—hold true, gifted readers should engage in some form of deep reading some of the time in order to achieve academic success. If the studies of Gee (2000) and Tapscott (2009)—the Aristotle of today— hold

true, the use of computers and other technologies has served only to further the learning and subsequent academic success of these gifted readers. In reviewing the literature, I was unable to find any information regarding the reading, studying and computer habits of gifted readers while engaged with text. How these students have achieved their academic success could provide insight into this growing new area of what is now termed “cognitive neuroscience” (Gazzaniga & Rakoff, 2010).

The Purpose of the Study

Through qualitative research in the form of case studies, I propose to explore the reading habits of four students identified as gifted readers. Based on the constructivist model (Bandura, 1991), the student is free to arbitrate his own study methods for what he deems maximum learning and academic success. These students may differ widely in what they consider distractions and what they consider inducements. I propose to examine how their reading behaviors impact their reading achievement.

It should be understood that undistracted reading is a nebulous concept. For some, music can be distracting, but others may find it necessary in order to concentrate; still others may find a dog barking in the distance an annoyance while some may not even notice it. Therefore, for the purposes of this study, deep reading habits will be determined based on the students’ customary reading habits. The research proposes to explore how the self-regulated reading behaviors of gifted readers impact their academic reading achievement. I want to explore the students’ epistemological beliefs—that is, their personal understanding of how they have obtained knowledge—that led them to status of gifted reader. This study intends to answer the following research questions:

1. What self-regulated strategies do students employ while reading a text for comprehension?
2. What epistemological beliefs influence students' choice and use of heuristic strategies to fully engage with printed text?
3. How are self-regulated learning strategies and epistemological beliefs related to student performance on reading comprehension tests?

As part of this research, students will complete a survey of past reading habits and journal current reading practices. I will observe the students in their natural studying environment and interview them. Finally, I will compare the results of two teacher assessments to the students' observations of their reading habits.

Definition of Terms Neurological Terms

Because much of deep reading is predicated upon brain studies, the terms below represent the current understanding of neurology and clarify its impact on the study of deep reading (Schunk, 2008).

Central Nervous System (CNS). Composed of the spinal cord and the brain, it is the body's central mechanism for control of voluntary behavior and is composed of billions of cells.

Neurons. Cells that send and receive information across muscles and organs, do not regenerate, and communicate with one another through electrical signals and chemical reactions.

Glial Cells. More numerous than *neurons*, they remove anything they may obstruct *neurons*, remove dead brain cells, and put down *myelin*.

Myelin. Sheath-like substances that smoothens the transfer of neurons. Some scientists postulate that the more myelin a person develops around a talent, the more successful they will be. *Myelin* is built over time, and the more that is built, the more expert the person will become.

Automatic Nervous System (ANS). The *ANS* is at the base of the brain in the brainstem and handles the involuntary functions of the body.

Reticular Formation. A network of *neurons* and fibers that regulate involuntary movements in the body. *Reticular formation* also helps control sensory inputs that enable people to focus on relevant stimuli critical for attention and perception while filtering out irrelevant stimuli.

Amygdala. The *amygdala* is involved in the control of emotion and aggression and assesses the harmfulness of sensory inputs.

Hippocampus. Responsible for memory of the immediate past, helps establish information in long-term memory (LTM), maintains a role in activating that information as needed, and may be involved in the role of working memory (WM).

Parietal Lobes. They are at the top of the brain and responsible for the sense of touch, help determine body position, and integrate visual information.

Temporal Lobes. They are responsible for processing auditory information.

Wernicke's Area. This area allows people to comprehend speech and use proper syntax when speaking.

Frontal Lobes. The area that processes information related to memory, planning, decision-making, goal setting and creativity. Some experts believe this area distinguishes humans from lower animals and even people in generations past.

CHAPTER II

LITERATURE REVIEW

The Beginning of Literacy

2000 Years of Evolution Undone in One Decade

Some historians speculate that it took the human species roughly 2000 years to make the necessary intellectual breakthroughs to learn to read with an alphabet, and today our children have roughly 2000 days to reach the same insights involving print. However, this time frame does not incorporate reading and writing on the computer with a technology so advanced that its rapid-fire, multiple-sensory imagery may be overloading the brain and disrupting a child's developmental ability to read, reflect, think and synthesize. That is, some contend that humans are not wired to read and that reading has to be gradually learned through a carefully limited and structured process (Wolf, 2007).

Writing, also, began with two or more epiphanies: first came symbolic representation, one level of abstraction more than earlier (caveman) drawings in which the discovery of simple marked lines on clay tokens, stones, or turtle shells could represent something concrete in the natural world; second came sound-symbol correspondence, a stunning revelation that all words were actually composed of tiny individual sounds and that symbols could signify each of these sounds for every word. Therefore, symbolization, even for the tiniest token, exploited and expanded two of the most important features of the human brain: a capacity for specialization and a capacity for making new connections among association areas, a process that takes

approximately twenty years to develop and perfect (Wolf, 2007). The concerns felt by some scholars are that today's fast-paced digital world threatens to undermine this evolution after only one decade (Cornish, 2010; Wolf & Barzilla, 2009).

The other side of the debate extols the computer's ability to overstimulate the brain. The brain is adaptable and organic and makes the necessary adjustments to accommodate the deluge of information (Tapscott, 2009). Researchers have proposed that video games need to be taken into the educational arena and grounded within a theory of learning since video games can be constructed to embody social practices (Shaffer, Squire, Halverson, & Gee, 2004). Neurologists who have studied damaged brain areas have noted that the brain will make adjustments and use other areas to make up for the damaged areas (Dockter, Haug, & Lewis, 2010). Similar adjustments are being made to accommodate the barrage of information stimulating the brain in the Information Age, so there is much change to look forward to from the younger generations. The net result is a generation of young people who are more informed and who can learn to process and synthesize information quicker and better than previous generations thanks to the brain's ability to adapt (Gee 2000, 2001, 2003).

Traditional Definitions of Literacy

Since the nascent days of reading and writing, literacy has been an ill-defined concept resulting in multiple, complex interpretations that evolved with technology. The earliest definitions were influenced by the tools humans had at their disposal to produce text. The simplest definitions have called literacy an alphabetic literacy (McLuhan, 2009), the ability to read and write (Jones-Kevalier & Flannigan, 2006), and reading and writing with words (Burmark, 2004). Steinkuehler (2010) considered literacy the ability to read and write

alphabetic print, any form of oral and written communications, and the facility to decode and encode meaning into quasi-persistent text plus images. Edwards (2010) found that a literate person has the skill to interpret signs and symbols which, when put together, form messages that convey meanings. Booth (2006) discovered that the traditional foundations of literacy are still the building blocks that includes "...word and vocabulary recognition, decoding, knowledge, comprehension, critical analysis, the writing and spelling..." (p. 13).

Literacy is a practice seen as socio-cultural mediated by and constituted in social systems and social practices (Moje, Overby, Tysaer & Morris, 2008) requiring one to make sense of a variety of codes that are symbolic, visual, oral and embodied (Kress, 2003). Booth (2006) found that "Literacy is the process of constructing and interpreting meaning with the text (print or visual) you need or want to experience" (p. 34). His definition included modern technology and quoted Bill Gates: "Bill Gates has said that the only prerequisite for computer success is literacy" (p. 15).

Digital Literacy

After the advent of computers, literacy definitions broadened to incorporate the technology that evolved. Literacy thus expanded from traditional notions of reading and writing to include the ability to learn, comprehend, and interact with technology in a meaningful way (Coiro, 2003). Skaar (2009) wrote that digital technology is part of a multimodal design whereby meaning is created through the interplay of different modes.

O'Briean and Scharber (2008) concluded that digital literacies are considered social situated practices supported by skills, strategies, and stances that enable the representation and understanding of ideas using a range of modalities enabled by digital tools. Literacy now

expanded into the arena of the digital world, encompassing a metadiscursivity, which is the ability to engage in many different communities; that is, a person is required to be more aware of his audience and the impact those meanings make in terms of social positioning and power relations (Moje, Overby, Tysvaer & Morris, 2008). Steinkuehler (2010) put it another way: “Digital literacy is its own ecological niche and, as a part of that niche, its own complex relationship with every other medium” (p 62).

Digital literacy has often been synonymous with visual literacy. Edwards (2010) wrote that visual literacy is reading images and symbols in the same manner as words. The definition has even been reduced to a how-to instruction for Microsoft software by *skills and competencies* pundits who have been greatly influenced by the technology of the day; that is, in schools today *critical literacy* is not imagined as learning how to navigate the networks and gain mastery of these applications (Harley, McWilliam, Burgess & Banks, 2008).

Yancey (2009) further considered digital literacy a multiple model of composition whereby all media operates simultaneously and is dependent upon new publication practices, new materials and new vocabularies. Herrington and Moran (2009) regard digital literacy as the ability to comfortably use and combine print, spoken and visual digital processes in composing a piece of writing.

Jones-Kevalier and Flannigan (2006) wrote that digital literacy is a person’s ability to perform tasks effectively in a digital environment, recognizing that this is information represented in numeric form and for use primarily by the computer; it is also the ability to read and interpret media (text, sound, images) to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments

emerging from seeing and integrating sensory experiences. By using the cachet *compound literacies*, McLuhan (2009) elaborated that compound literacies is a term that incorporates a number of media and respective literacies.

Averinou (2009) found that digital literacy interprets the world-as-picture that is at least as equal to the world-as-a-text. Digital literacy is a group of skills that enable an individual to understand and use visuals for intentionally communicating with others, the ability to read/decode/interpret visual statements and to write/encode/create visual statements, and to accept and incorporate theoretical contributions from other disciplines. Burmark (2004) simply defined it as the reading and writing of images that is more basic than the reading and writing of words. Merchant (2006) considered digital literacy synonymous with the concept of *computer literacy*. This term embraced computers and all its progeny including the mechanical and navigational issues that go with it as well as reading and writing with new technologies as its central concept.

Adolescence and Literacy

What is Adolescence?

Adolescence is also a vague term open to multiple interpretations since each adolescent is unique (Moje, Overby, Tysvaer, & Morris, 2008). Moje (2002) wrote that adolescence assumes a link between biology, or physiological changes, and cognitive and affective changes in young people that causes many parents, teachers and theorists alike to view them as nothing more than a biologically changing, unstable body. Youth become a class of people who are out of control in their cognitive and social development, including literacy development that is backgrounded to physiological development. However, adolescents are also sophisticated

meaning-makers who use various texts to represent or construct identities, so one should examine youth's meaning making and not be quick to dismiss them (Spear, 2000; Bennett, Maton & Kervin, 2008).

Adolescents' Relationship to Literature and Technology

Herrington and Moran (2009) unequivocally asserted that teenage literacy has changed. It is no longer an exclusive world of print, but a social world of email, cell phone text messaging, and online gaming. Yancey (2009) wrote that today's students understand the power of networks and networking via writing and social communities on the computer and that most students do not just stop with Facebook or MySpace.

Teenage literacy includes video games, which lay the nexus of a complex constellation of overall literacy practice; video games are about a back and forth between reading the game's meanings and writing back in to them; sharing a mutual relationship with literacy, video games recruits important digital literacy practices (Steinkuelher, 2010). Today's students understand the power of networks and networking; social communities on the computer including online video games which lie at the heart of much of an adolescent's literacy practices, comics, magazines, newspapers, the internet, email graphics, video and sound; and that the mastery of the digital word is complex and surpasses the literacy ability of many adults (Booth, 2006; Turner, 2010). Mahiri (2008) used the term *Digi-Pop* to signal the confluence of technology and youth popular culture with the advent of new literacies and influences from hip-hop culture. In her studies Moje (2002) found cases like this: a teacher amazed at one of her students, a struggling reader, whom she observed combining print texts with other icons, images, numbers,

and oral language to construct sophisticated understandings of complex instructions for playing Pokemon.

Moje (2008) wrote that young people have used literacy as a part of an identity development. Touchstone Texts, comprised of novels, films or song lyrics, allow adolescents to try on and evaluate identifies. So-called unsanctioned literacies such as teen magazines are part of the rite of passage from childhood to adulthood (Moje, 2002; Turner, 2010; Gee, 2000; Phelps, 2005).

Clearly, technology absorbs much of a youth's time, disturbing news for those who believe this hurts a youth's intellectual development and cognitive neurologists who feel it is changing the shape of the brain. According to Rosman (2010), the average number of text messages received from 13-to-17-year-olds is 3330 per month or more than 100 per day; adults aged 45-54 send and receive 323 texts a month. Prensky (2003) found that before kids enter college, they can expect to spend over 10,000 hours playing video games, 10,000 hours talking on digital cell phones, 20,000 hours watching TV, and 5000 hours at the most on reading books; sites like Twitter, with postings of no more than 140 characters, are creating and reinforcing the habit of communicating in micro-bursts.

This has serious effects on a teen-ager's cognitive development (Wolf, 2007) and perceptions of his literacy abilities (Santa, 2006). Teens think that just because their eyes passed over a printed page and they pronounced the words, they were reading (McGrath, 2005). According to Roberts and Roberts (2008), "Although children learn the *mechanics* of reading in the early elementary grades, reading with understanding and meaning is a skill that needs to be nurtured over many years" (p. 125). Because they were spending less time on

undistracted reading practices during their formative brain development years and more time on the immediacy and distractibility of the technologized world, they did not notice that they were not comprehending the information written in a textbook (Cornish, 2010).

However not everyone feels these changes are detrimental to today's youth and that literacy time and skills have not decreased. Prensky (2003) wrote that "...on deeper levels they [adolescents] learn infinitely more" (p. 2). When studying one English class that focuses the whole semester on media analysis and documentary production, the researchers found that "Students read and write as much as they would in typical English classes, but do so in the process of analyzing and producing media texts, including collage, digital stories, podcast memoirs, and, ultimately, a documentary film" (Dockter, Haug & Lewis, 2010, p. 418). Literacy has changed as society has demanded it change through the years. There are new ways to represent ideas, new ways to encode language, new ways to spend time reading and writing. The literacy worth of an individual is still judged by one particular art form: printed text normally found in schools. What is not taken into account is other multiple forms of reading and writing that contribute to adolescents being a kind and caring generation who live in a hybrid cultural world of technology while thinking, reflecting and making meaning of their everyday lives (Booth, 2006; Gee, 2000, 2003; Gee & Levine, 2009; Moje, 2002; Shaffer, Squire, Halverson & Gee, 2004).

Digital Literacies and School

Literature, that is the kind taught in today's schools, is not the only measure of a youth's literacy ability, and today's institutions need to explore a reexamination and redefining of literacy. Gee (2001) wrote "The verbal abilities that children who fail in school lack are not just

some general set of such abilities, but rather specific verbal abilities tied to specific school-based practices and school-based genres of oral and written language..." (p. 724). In school's today *digital literacy* has been used to describe the skills and competencies it takes to use software, but has yet to embrace critical literacy which would include navigating the networks and mastering the software from a technological standpoint, reduces the creative possibilities for a method of control, widens the dichotomy between school-based literacy print and the comprehension of software for uncontrolled self-realization, and stalls the educational practice at a provider/control model rather than a navigator model where learning is distributed in networks and better individualized (Hartley, McWilliam, Burgess & Banks, 2008).

The overlying question behind this debate, though, is the development of the brain, its elastic nature to accommodate the reading process, and whether or not this development, if indeed it is different, is detrimental to future generations. Concerns about digital literacy and today's youth revolve around a circumvention of the brain's need to develop and refine. The brain needs to think and reflect during the reading process and while learning to read as opposed to the immediacy and overabundance of the digital world. This immediacy has made the search for deeper levels of meaning more and more anachronistic; students today are so accustomed to the immediacy and seeming comprehensiveness of on-screen information that are available to them without critical effort and without any apparent need to go beyond the information provided (Wolf 2007; Cornish, 2010; Prensky, 2001; Santa, 2006; Roberts & Roberts, 2008) while others feel the brain is adapting to these changes making today's teenagers better informed, more creative and better equipped to synthesize information (Gee, 2000, 2003, 2009; Tapscott, 2010; Moje, 2002).

Methods for Studying Brain Activity

Several methods of studying the physiological activity of the brain are the basis today for much of the conclusions concerning brain activity. The electroencephalogram (EEG), a recording of electrical activity from the scalp, has been very useful for determining the region of the brain that is specialized for specific modalities such as speech perception and bodily sensation. A specific component of the EEG called the Evoked Response Potential (ERP) analyzes cognitive processing. The three major benefits from using EEGs and ERPs are that (a) the approach is noninvasive, (b) it can be used on alert, normal human subjects, and (c) it provides a better temporal resolution between underlying neurophysiology and behavior than other techniques. The major problem with EEG recordings is that it is a composite signal from volume conduction in many different parts of the brain and is far from clear what a signal means in terms of how neurons in the relevant networks are behaving (Byrnes and Fox, 1998; Gazzaniga & Rakoff, 2010; Kalbfleisch, 2008).

Functional magnetic resonance imaging (fMRI) and position emission tomography (PET) also reveal active areas in the brain. All types of MRI utilized the natural magnetic properties of atomic particles in substances. Similar to simple dipole magnets, the molecules of many substances (e.g., water) have positive and negative poles. When a strong magnetic field is passed over such molecules, most of the molecules tend to align themselves in the direction of the field. When the magnetic field is turned off and a pulse of harmless radiation is directed toward the aligned molecules, some of the molecules reverse their polar orientation and give off a small amount of energy. This energy can be detected and used to create a visual image of

the substance in question (e.g. a slice of brain tissue). fMRI makes use of differences in the magnetic properties of different substances to create images of active areas of the brain. In recent years, fMRI have become the method of choice for three reasons: (a) It has excellent spatial and temporal resolution, (b) subjects are not exposed to ionizing radiation, and (c) an individual subject can be studied repeatedly. This emerging technology allows for more in-depth studies and analysis of the brain's operation and parallel findings among cognitive, educational and neuroscience psychology (Byrnes and Fox, 1998; Gazzaniga & Rakoff, 2010; Kalbfleisch, 2008).

Merging Neuroscience and Cognitive Psychology into Cognitive Neuroscience

This leads into a discussion of a new study: cognitive neuroscience, a blending of cognitive psychology and neuroscience. Cognitive neuroscience, a new term coined in 1990 that has been growing as technology as better enabled the study of the brain, in its simplest definition is a study of how the brain enables the mind (Gazzaniga & Rakoff, 2010). The more psychologists learn about the individual aspects of the mind, the more they have seen that one aspect (e.g. cognition) was not really independent of other aspects (emotion); a growing number of cognitive psychologists have recognized that the division between researchers who study cognition and researchers who study brain processes is no longer helpful and that scholars must come to use the findings of cognitive neuroscience to transform the field of educational psychology. In fact, psychological terms and neurological terms have the same referents and each side should become more bilingual (Byrnes & Fox, 1998, p. 297-300).

Neuroscientific findings and cognitive psychology overlap in many areas. Among the findings: the studies of dyslexic children and normal adults using PET scans corroborating and

extending the findings on the studies of brain-injured individuals; studies supporting the maturation of the frontal lobe matching the acquisition of Piagetian skills in which Piagetian skills, syntactic processing, and phonemic analysis have all been linked to the frontal lobes; Piagetian measures of concrete operations, measures of syntactic awareness, measures of phonemic awareness all coinciding with the maturation of the frontal lobes; fMRI research on the cortical plasticity of the brain for more insights into studying reading interventions (Byrnes & Fox, 1998). Much is to be gained by educators when an interface between educational science and cognitive neuroscience, likened to a bilingual terminology, is developed and more collaboration is needed in this area (Ansari & Coch, 2006). Gabrieli (2009) discovered that a combination of evidence-based teaching practices and cognitive neuroscience measures could prevent dyslexia from occurring in the majority of children who would otherwise develop dyslexia (p. 280).

Technology's Impact on Brain Development

As knowledge about the brain deepens and discoveries are made about its functioning in highly successful readers and people, cognitive psychologists have been worried about the brain trying to adapt to the 21st century digital age and the glut of information that competes for its attention. Short-term memory has limits; it must stay focused in order for learning to take place. Short term or working memory's ability to expand needs rigorous study because debilitating effects result from overburdening it with too much stimulation. Unrealistic expectations are placed on today's working force, thanks to the development of computers, that is unrealistic not only for the workforce, but for students in schools and colleges across the

globe operating with a *stone-age brain* in a 21st century whirlwind of information (Klingberg, 2009).

Tracing its known evolutionary development, Klingberg wrote that the brain people have today is almost identical to the one Cro-Magnons had forty thousand years ago. There are some limitations to our ability to handle information, limits present at the time when the most technically advanced artifact was the barbed bone harpoon. This same brain must now handle a deluge of daily information that engulfs people. Klingberg conceded that the brain is elastic and can change to the demands placed on it, but the restructuring is fleeting and largely dependent on use. Three months activity or three months passivity has an immediate impact on the brain structure (Klingberg, 2009). Wolf (2007) contends that reading is an unnatural function of the brain and takes years of undistracted concentration to develop.

Working Memory, the temporary storage that filters data into Long-Term Memory for learning and deep reading, consists of a visuo-spatial scratch pad, used to store visual information, a phonological loop, used to store verbal information, and a central executive, that directs attention and coordinates processes. In other words, Working Memory refers to a system for both temporary storage and manipulation of information necessary for a wide range of cognitive tasks. It has capacity limits that may be increased by a maximum of 18% with repeated work, meaning it has some elasticity like the brain, however 18% it not a lot. Working Memory is also more accurately described as a passive storage component that controls attention. Research in this field has tried to unify concepts from cognitive psychology, neuropsychology, and non-human primate neurophysiology. With modern technology vying for so much of everyone's Working Memory, the brain simply cannot focus attention on any one

thing long enough to process the data into long-term memory for learning and comprehension to take place (Baddeley, 2003; Klingberg, 2009).

Studies have revealed some alarming trends. Hallowell (2005) found that *Attention Deficit Trait* (ADT), cousin to *Attention Deficit Disorder* (ADD) and *Attention Deficit Hyper Disorder* (ADHD), develops with multiple sensory stimulation showing symptoms of distractibility, inner frenzy, and impatience causing people to have difficulty staying organized, setting priorities, and managing time, conditions rooted in a hyperkinetic environment. The brain reverts to simpleminded black-and-white thinking, perspectives and shades of grey disappear, and intelligence dims, paradoxically shutting the brain down. Conway, Kane and Engle (2003) wrote that cognitive scientists discovered a relationship between working memory's ability and intelligence. However, new factors are arising which put into the question this exact relationship. With the influx of data into the Working Memory, the brain invokes an Executive-Control Mechanism (ECM) to combat interference and prioritize attention to the bits of information. Christakis and Morenso (2009) found that ADHD was a significant factor in Internet addiction and that people with ADHD, who get bored easily, find the Internet with its rapid-fire, instant gratification an escape from this tedium; this draws into question an ability to learn with such imagery pulsating into Working Memory. Han, Kim, Lee, Min and Renshaw (2010) discovered that after six weeks of Internet video-game play, healthy university students showed prefrontal cortex activity changes that are similar to drug and alcohol addiction. In another study on working memory, Draganski, Gaser, Busch, Schuierer, Bogdahn and May (2004) looked at a region of the brain responsible for expert motor skills by using MRIs. Participants were asked to juggle repeatedly until the skill was perfected, and then they

discontinued the activity for three months. They concluded that these individuals showed a transient and selective structural change in brain areas that were associated with the processing and storage of complex visual motion. The scans completed three months later found they were no longer fluent in this area of the brain, meaning that such gains would atrophy without use. Richtel (2010) wrote that a study he authorized on himself determined that effective task switchers have a neurochemical advantage that makes them less likely to overreact or become overwhelmed by task switching, that distraction and multitasking are contributors to deficits in memory, and that people's ability to juggle two tasks drops off in their 30's and 40's. Geake (2008) completed a study on the brain of gifted students and found that a neural feature of intellectual giftedness called fluid analogizing, a cognitive construct that describes selective processing within the brain, better enables various facets of Working Memory associated with prefrontal activity. These studies give caution to the effect technology has on the brain, the limits of Working Memory, and support more studies in these areas.

To become expert readers, people must engage in a lifetime process that connects multiple regions of the brain. Expert readers use different comprehension processes as well as different semantic and syntactic processes with all of their corresponding regions in the cortex to figure out a text. Overloading the Working Memory counterattacks proficient reading skills thereby reducing learning, analyzing, synthesizing and evaluation (Wolf, 2007; Roberts & Roberts, 2008; Cornish, 2010).

Deep Reading

This leads into a theory called deep reading. The article "The Importance of Deep Reading" by Wolf and Barzillai (2009) defined deep reading as "...the array of sophisticated

processes that propel comprehension and that include inferential and deductive reasoning, analogical skills, critical analysis, reflection, and insight” (p. 32). According to Wolf and Barzillai, we should be concerned about the computer’s impact on the brain’s ability to develop these skills because

Both of these pivotal dimensions of time are potentially endangered by the digital culture’s pervasive emphases on immediacy, information loading, and a media-driven cognitive set that embraces speed and can discourage deliberation in both our reading and our thinking (p. 32).

Wolf (2007) posits in her book *Proust and the Squid* that a human is not predisposed to the kind of focus and attention it takes to immerse oneself in deep reading. To read a book is to practice an unnatural process of thought, one that demands sustained, unbroken attention to a single static object. People have to train their brains to ignore everything else around them, a training that is contrary to years and years of evolutionary jungle survival skills. In other words, the brain has to forge or strengthen the neural links needed to counter their instinctive distractedness by applying greater top-down control over its attention. The ability to concentrate on one task is a strange, unnatural anomaly for the human brain. The ability to deep read is predicated on training the brain to eschew thousands of years of wiring for survival, and this process takes time to nurture.

Psychologist Patricia M. Greenfield (2009) of the University of California at Los Angeles (UCLA) concurs with her theory of *deep processing*. In her study she stated that video games penalize the player who stops to reflect and in fact, no real time medium including television or the radio allows times to reflect. She writes that

...we have known for more than 40 years that there is an association between reading skill and reflection. Starting in first grade, better readers are also more reflective than less skilled readers are. Moreover, reflection (contrasted with impulsivity) is associated with inductive, problem-solving competence in children as young as first grade.

Whereas reading is associated with reflection, television is associated with impulsivity (p. 71).

These concerns mirror much of the findings of the neurologists who contend that the brain, while organic, has limits. While skills can be perfected and learned over time, it takes that deep reading and deep learning to fully engage the brain to learn at its optimal. Neurologists call this *selective attention* and define it as "...the processes that allow an individual to select and focus on particular input for further processing while simultaneously suppressing irrelevant or distracting information" (Stevens & Bavelier, 2012, p. 30).

Miall and Dobson (2001) conducted a study on reading hypertext and literature. They concluded that "In a study of readers who read either a simulated literary hypertext or the same text in linear form, we found a range of significant differences: these suggest that hypertext discourages the absorbed and reflective mode that characterizes literary reading" (p. 1). Liu (2005) conducted a similar study. She found that "The screen-based reading behavior is characterized by more time spent on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and reading more selectively, while less time is spent on in-depth reading, and concentrated reading" (p. 700).

Roberts and Roberts (2008) defined deep reading as "...reading for long-term retention of the material and for comprehension at a level that can be perspective-transforming" (p.

125). They further asserted that quizzes and multiple choice tests encourage surface learning based in episodic memory depriving the reader of this deep reading, transformative experience. It is this transformative experience of deep reading that Sven Birkerts (1994) cautioned is on the decline when he writes “Chip and screen have at one and the same time inundated us with information – pages to view, links to follow, media supplements to incorporate – and modified our habits. They have put single-track concentration, the discipline of reading, under great pressure” (p. xi).

Deep reading is gathering more attention and more momentum now that computers have enabled TV, Radio, the internet, email, long-distance video calling, and video games to be accessed from one place simultaneously. Indeed their impact on the developing minds of our youth has been studied since these inventions first permeated the landscape at the start of the 20th century. Multiple scholarly fields such as education, psychology, neurology, and sociology have delved into technology’s overall influence. Today’s high school gifted readers have grown up under these technological advances and have achieved academic success nonetheless. A probe into their coping mechanisms to achieve this vaunted success is the basis of this study.

Everding (2009) wrote that to enter into deep reading enables the reader to build mental simulations of narrative situations. Getting lost in a good book means re-creating the sounds, sights, tastes and movements described in the text, and brain scanning results indicate that regions of the brain responsible for the aforementioned sensory areas are activated by reading. Mangen (2008) asserted that reading digital texts places us at an indeterminate distance from the actual text, whereas when reading print text we are physically and phenomenologically (and literally) in touch with the material substrate of the text itself. She

contended that the tactile experience with the book, the touching the pages, the feel of the covers on the hands, helps immerse readers into the deep state of reading whereas the constant point-and-click of the computer mouse coupled with hyperlinks impedes deep reading.

To further complicate the cognitive process of reading on the computer is the use of hyperlinks. Tyrkko (2007) noted the primary differences between hypertextual reading and conventional text reading is seen in the way in which the reader is required to interact with the flow of the text, and the complex processing involved in negotiating the resulting structural shift. Hypertexts promote a somewhat altered view of coherence itself because inferences need to be made that shift the brain away from the attention that is the staple of linear text and learning, so what is learned depends on the reader's knowledge base of the subject as to how much interpretation and meaning-making they must do; in other words, the less the knowledge about the subject, the more inferences need to be made which puts more demands on working memory. Hypertextual literacy has a constant need for active interaction for its quick transitions all of which robs the reader of the deep reading experience. Hypertextual reading absorbs some of Working Memory capacity, distracting the brain, debilitating processes into Long-Term Memory and learning (Tyrkko, 2007).

Technology in the Classroom

Much research had come about through the years that extol the use of technology in the classroom and the manner in which it empowers the students. In her 2002 study on disadvantaged middle schoolers, Wills (2002) established a computer camp to teach them computer basics hoping to improve their performance in the classroom. What she discovered

was that her students knew more about computers than her graduate students did, and the students took over the assignments using color and sound in their writing while the teachers looked on helplessly. They empowered themselves through digital writing, and Wills concluded, “This redefinition of writing could be seen to be situated in classic rhetorical notions of delivery, purpose and audience” (p. 17). Yancey (2009), then president of the National Council of teachers of English (NCTE), endorsed a new writing pedagogy in the classroom that maximizes the use of computers. She stated that in the 21st century people write as never before and declared that “We thus face three challenges that are also opportunities: developing *new models of writing*; designing a *new curriculum* supporting those models; and creating *models for teaching* that curriculum” (p. 1). Tapscott (2007) called for a huge reform in education to meet the demands of kids who grow up as Digital Natives, or Net Geners, whose brains are being rewired to conform to computer speed stating in the old model students are expected to absorb vast quantities of content – some relevant but most not relevant to life whereas Net Geners, immersed in digital technology, are keen to try new things, often at high speed. Turner (2010) found that by valuing the language that students use outside of school, such as Digitalk and Instant Messaging (IM), teachers can make school language more accessible claiming Digitalk is intricate, complex, and evokes a talking style over a printed style; she also found that mastery of the digital world surpasses many adults’ literary abilities in the textual, printed world. All of these negated the impact deep reading made on the development of the brain.

However, literature is emerging that advises educators to exercise caution when preparing technology-grounded lessons. Bennett, Maton and Kervin (2008) wrote that their analysis of the digital native literature demonstrates a clear mismatch between the confidence

with which claims are made and the evidence for such claims. They claim the beliefs about digital natives are a form of *moral panic*, when society panics over a new group such as youth subculture, because the media portrays them as a threat to societal values and norms. Likening the discourse of digital natives onto moral panic, they write that “...young people’s use and skills [of technology] are not uniform. There is no evidence of widespread and universal disaffection, or of a distinctly different learning style the like of which has never been seen before” (p. 783). Digital Natives merely use technology in different ways at school and at home.

McLuckie, Rodrigues, Taylor and Williamson (2007) studied two male adolescents working on a computerized science simulation project. These students were chosen because they could think aloud and give the researchers data about the time spent on the computer basics versus the content basics. They discovered that students need to understand their subject, be confident and competent with respect to using the available technology, and have language skills that enable them to establish links between the microscopic, macroscopic, and symbolic components of science. They further concluded that digital literacy needs to be taught more explicitly, if the available technology is to do more than simply provide increased amounts of better-presented data. Manipulating the software for a fancy presentation did not equate to a deep reading experience in which the students may have learned something.

Thiessen and Looker (2007) studied increased reading achievement in a 15-year-old Canadian male. Their findings suggested that overall computer use, up to a point, is associated with higher reading achievement scores, suggesting a possible positive effect if used in moderation. ICT (Information and Communication Technology) is not educationally

transformative but neither is it detrimental to reading achievement, except when used excessively.

The importance of studying the deep reading phenomenon cannot be stressed enough. More studies need to be done, more conclusions need to be drawn, and more strategies need to be implemented that teach and encourage a deep, reflective reading on computers or electronic devices. Otherwise, gains may be minimal to non-existent (Wolf & Barzillai, 2009; Thiessen & Locker, 2007). Therefore, if the theories of deep reading hold up, the brightest students of today must have engaged in the basic tenants of deep reading as a cornerstone to success, and a look at today's gifted students, more specifically gifted readers, should help illuminate some of the reading processes they encounter to achieve their giftedness.

Gifted Students

The definition of a gifted student is also vague because of its changing, complex nature. Early Western views of extraordinary creative behavior are predicated on the Greek view of genius being equated with demigods, with madness, or with both. Socrates and Goethe ascribed god-like forces and divine intervention to explain the nature of genius; many extraordinaires' works, such as those of Michelangelo, were deemed divine. Thus, the major source of a person's individual creative behavior lies less within him or her and more outside him or her in the realm of the supernatural or preternatural. (Albert, 1975).

Gifted students have been defined as being highly curious and who intrinsically find relationships between specific stimuli; they also perform well in specific domains (Song and Porath, 2005). The term *giftedness* has even encompassed an emotional side morphing into a greater awareness, a greater sensitivity, and a greater ability to understand and transform

perceptions into intellectual and emotional experiences. It has also been described as asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm (Silverman, 1993). Ultimately, a student's gifted abilities depend on: the values of the culture; the definition adopted by a particular school district that guides the identification process and determines who is selected; programming practices; and the positive or negative labeling effect the title may have. Therefore, no one definition of gifted or talented is universally accepted (Davis & Rimm, 1998).

The federal definition for gifted students, from the Elementary and Secondary Education Act, Title IX, identified five general areas:

GIFTED AND TALENTED – The term “gifted and talented”...means students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities. (Part A, Section 9101(22), p. 544)

While states may agree to the theoretical definition of giftedness, the operational definitions are likely to vary. The state of Georgia defines a gifted student as:

A student who demonstrates a high degree of intellectual and/or creative ability(ies), exhibits an exceptionally high degree of motivation, and/or excels in specific academic fields, and who needs special ancillary services to achieve at

levels commensurate with his or her abilities (State Board of Education Rule 160-4-2-.38, p. 1).

Believing that a single definition defies the principles of the cultural and temporal relativity of the concept of giftedness, it is not necessary to define something in order to understand it. Intelligence, once thought to be unitary, is now widely considered to be multidimensional and dynamic (Cramond, 2004; Pfeiffer, Kumtepe & Rasado, 2006).

The Gifted Reader

Not all gifted students are gifted readers and, as such, *gifted reader* necessitates its own category because precocious readers are not necessarily brilliant. Gifted readers read one or two years beyond their chronological grade placement, exhibit the ability to generalize, work comfortably with abstract ideas, synthesize diverse relationships to a far higher degree than other students, are quick to integrate prior knowledge and experience with text information, are comfortable and productive in the application of higher level thinking skills (analysis, synthesis, evaluation) to the written text, and are capable of communicating the outcome of the individualized processing of print. Gifted readers are voracious readers who read to know and may consider reading a fun and preferred activity (Catron and Wingenbach, 1986; Vosslamber, 2002; Collins & Alex, 1995; Baskin, 1984; Liium, 1992; Reis, *et. al.*, 2004).

Gifted readers adopt different strategies for reading and reading comprehension. In a study of 30 gifted and average readers, Fehrenbach (1994) found that gifted readers reread, infer, analyze structure, predict, evaluate and relate to content area more than an average reader. Gifted readers exert more control over their reading by incorporating personal interpretation of what they have read. They have internalized their own word attack processes

and intuitively use root words, prior experience with words, context cues, receptive/expressive vocabulary knowledge, and move from the visual features to meaning above the average or good reader. Such is not the case for all gifted students (Catron & Winbenbach, 1986; Fehrenbach, 1994).

From the research above it would presume that gifted readers or those who accelerate in reading skills and comprehension have developed strategies that enable deep reading and that their brains have made the necessary connections conditioned by deep reading practices to learn. There is no literature or studies yet that directly tie deep reading practices to gifted readers, and that is the purpose of this dissertation. If indeed deep reading is a requirement for learning, then gifted readers should have employed such habits. A case study method will be utilized to analyze this very possibility.

Theoretical Framework: Albert Bandura

The research in this dissertation has investigated a number of theories about an adolescent's relationship to literacy through social constructs. Phelps (2005) wrote that "Adolescent literacy development is demonstrably influenced by social, cultural, and linguistic variables..." (p. 1). Adolescents use literacy to help form an identity and develop a social network with their peers (Moje, 2002). With the rise of global communities spanning the digital divide, the rapid pace of information, social, and technological change placing a personal efficacy on self-renewal and self-development (Bandrua, 2001), and the explosion of text messaging, Internet use via cell phones and online gaming (Herrington & Moran, 2009), the theories of Albert Bandura best lay the groundwork for a theoretical framework. He did

extensive studying on learning, the motivation to learn, and the social factors involved in this process.

The Social Influence of Learning

Human influence on learning is a reciprocal process, not unidirectional, no matter if the influence is individual or collective. A student's influence depends on how much power he will yield, the subsequent consequences of these actions, or the foreseeable outcomes that become symbolic acts to be converted into motivators and regulators of behavior (Bandura, 1982). The stronger a student's efficacy, the greater his interest and the better he prepares himself for future challenges. Students will regard a school environment favorably if their peers accept them and will support them under adverse conditions, become less despondent if their peer relationships enable them to withstand adverse situations at school, and receive favorable feedback towards those goals with both feedback and goals paramount to students' success (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Bandura & Ceervone, 1983). The power of social media and the amount of time students seek each other out may contribute to the decline of deep reading and students' intellectual interests.

The Gifted Reader as a Subculture of High School

Social norms do not dictate human behavior or else people would act like weathervanes, turning to whatever direction the current social norm dictates. People possess self-reflective and self-reactive capabilities that give them some control over thoughts, feelings, motivations and actions governed by interplay of self-generated and external sources of influence. People's values and the functional significance of different activities will be attended

to by certain aspects of functioning while ignoring those that are of little import to them, not just mindlessly following the direction of the latest social dictates (Bandura, 1991). If this theory holds up, then gifted readers would reject the social norms of their peers and the inducements of online reading for traditional reading exercises and in the process, receive support from like peers and influential family members.

People have changed little genetically over recent decades, but they have changed considerably through rapid cultural and technological evolution in their beliefs, mores, social roles, and styles of behavior. Social means alter social systems and lifestyles rather than reliance on the slow, protracted process of biological selection. A hallmark of human beings is an endowed plasticity intrinsic to the nature of humans and depends upon specialized neurophysiological structures and mechanisms that have evolved over time (Bandura, 2001).

Should this be the case, then the proliferation of digital literacy and the explosion of the Information Age has not harmed today's gifted reader but given him extra resources upon which to be successful. The supplanting of deep reading printed text for digital literacy, with its emphasis on immediacy and non-linear direction, serves as a social backbone for today's adolescents and may cause many of them to eschew printed materials and quiet, reflective time that some say are vital to the brain's comprehension development. Probing the reading habits and background of students tested by the school as gifted reader shed more light in this exciting, growing field of cognitive neuroscience and deep reading.

CHAPTER III

METHODOLOGY

Since the theory of deep reading is grounded in the belief that the brain must undergo periods of undistracted concentration to make the requisite connections for learning to occur, and since the theory also posits that the more an individual disciplines himself this way the more this person will comprehend and retain over time, a close examination of the gifted student's individual study habits in home and school environments should provide additional insights into further understanding this theory. Qualitative research is the best methodology for examining the multiple components of deep reading.

Qualitative research examines a plethora of factors that may influence a situation, is optimal when there are a number of individuals available for focus groups and individual interviews, requires time spent in the field with the participants to get as broad an understanding of the person in his environment as possible, and works from the ground up as an inductive approach (Hancock & Algozzine, 2006).

Qualitative research includes many types of research including grounded theory, phenomenology, ethnomethodology, ethnography, socio-linguistics, narratives and case studies (Grbich, 2007), stresses a phenomenological model, focuses on understanding and meaning based on verbal narratives rather than numbers (Wiersma & Jurs, 2009), and involves the researcher in the subject's natural environment for as long as possible to observe and analyze the multiple layers of findings that deepens the knowledge of the study (Creswell, 2007). Whereas quantitative researchers press for explanation and control, qualitative researchers

press for understanding the complex interrelationships among all that exists (Stake, 1995). Therefore, a qualitative approach that examines the complex interrelationships of a gifted reader provides the best means of analysis.

Case Study

Under the qualitative umbrella is case study. A case study is an in-depth analysis of a bounded system (Merriam, 2009), bounded by space and time (Hancock & Algozzine, 2009), describes a relationship between a grand phenomenon and commonplace particulars especially if the study involves meaning and is dependent on context (Dyson & Genishi, 2009), and is a research strategy that focuses on understanding the dynamics present within single settings (Eisenhardt, 1989).

Case studies reject positivist notions of reality, which stress that reality exists out there and is observable, stable and measurable (Merriam, 2009), in favor of the realist perspective (Gerring, 1996), which reflects a particular stance taken and reported objectively by the researcher (Creswell, 2007). Case studies emphasize that knowledge is constructed rather than discovered, underlies a constructivist view that provides readers with good, raw material to help them come to their own conclusions, are relativist in view because interpretations vary relative to the case's credibility and utility, are interested in insight, discovery and interpretation, and are best at generating an hypothesis whereupon the researcher contributes to the uniqueness of the case enabling the reader to derive his own meaning (Stake, 1995).

Case studies are of interest for their uniqueness as well as their commonality. A case is a specific, complex functioning thing. It is a bounded system drawing attention to it as an object rather than a process. The Greek symbol theta (θ) symbolizes that boundary and working parts

of a case (Stake, 1995). This study's θ is the deep reading habits of gifted students and their home and school environment.

For case studies it is important to look at the small unit first in order to understand the whole, involve both the particular and the general, and note the difference by the degrees or depth of the study (Gerring, 1996). No case study denies the importance of a single case under intense scrutiny; however, no case study can eschew generalizing altogether. Understood best in matters of degrees and not dichotomies, case studies partake of both worlds as a study of both something particular and general with a particularistic case study focusing on a particular situation, event, program or description (Stake, 1995; Merriam, 2009). In a new and growing area such as deep reading, this was ideal for case studies because the study of a select group of students as the small unit helped understand the general area of deep reading. To establish the veracity of deep reading, the many particulars that were the basis for gifted readers were examined in the student's home and school environments.

Case studies are descriptive because they offer a rich, thick description of the study and heuristic because they can contribute new meaning and assist readers in their attempt to understand the particular subject more in-depth. The case study takes the reader to a place where they would not otherwise have the opportunity to go, allows the reader see this world through the researcher's eyes and, more importantly, helps the reader vicariously understand that particular world to lower defensiveness to learning. Its objective is to get as close to the subject of interest as possible, in part by observing the natural environment of the subject and in part by examining the subjective feelings of the subject (Merriam, 2009; Creswell, 2007).

As a narrative inquiry, case studies emphasize how people understand themselves and their experiences, is grounded in the everyday world, is concrete and context-dependent, provide entry into that world, and help shape and support policy decisions. Narrative case studies focus not only on how life is experienced in the here and now, but how life is experienced on a continuum, are a way of understanding that experience, underscore a collaboration between researcher and participant over time, use narrative to make sense of that particular world, and help to determine what is relevant for further education and study (Clandinin & Connelly, 2000; Dyson & Genishi, 2005; Stake, 1995, 1992; Merriam, 2009).

With deep reading inextricably linked to brain studies and brain studies being a new, controversial area to study, an in-depth understanding of a careful selection of gifted readers and their undistracted reading habits helped us come to know how these students bettered their opportunities in school and gave us additional opportunities to test the waters of deep reading theories. By targeting gifted readers identified as such by the school system, this study proposed to examine closely the environment in which the students had mastered success in reading. Did they, indeed, engage in deep reading practices to qualify for gifted reading programs and maintain a stellar academic record, or were they reading with distractions and otherwise engaging their short-term memory? Having students journal their reading and study habits was an equally acceptable method for providing thick description for analysis. This was also important to this study since brain studies are such a strong component not entirely embraced by all members of the academic community. Specific to this study of deep reading is the latitude readers have to interpret the findings unique to their viewpoint; this reflects strong attributes in case studies.

Research Setting and Participants

This study took place in Scenic Heights High School in the northeast corner of a suburban county thirty-five miles north of a metropolitan city in the southeastern United States. Scenic Heights High School is a new school, seven years old, built with the latest technological advances. In every classroom there is a SmartBoard, at least five PC's, and wireless routers to insure multiple, speedy hook-ups. There are four dedicated lab rooms each with 32 PC's and a library that has its own media lab stocked with 32 PC's and another 32 on the main floor. In addition, each department has a mobile lab with 24 laptops in them, and some teachers even have their own mobile unit laptops, exclusively, for participating in the county's Teach21 program, a yearlong program that educates teachers on how to incorporate the latest software revolutions in their classroom instruction.

While Scenic Heights is not racially diverse, it is economically diverse. Approximately 97% of the population is Caucasian of European descent, with the remaining three percent being a mixture of Black, Hispanic and Asian descent. Many of the students either come from white collar, upper middle class families located in new suburban areas, or blue collar, middle to lower class families located in some of the rural fringes of the county. Most of the students in gifted classes come from upper middle class families with few coming from middle class and fewer from lower middle class families.

Data Collection

Sampling Strategies

Incorporated into this study was a purposeful, convenience sampling because it allowed the researcher to probe into the study habits of gifted readers to determine if deep reading

strategies were a part of their success. With purposeful sampling, the researcher wants to discover, understand, and gain insight, going as deep as possible into a particular case. Therefore, the sample studied is specific and purposeful to the particular case. Also called information-rich cases, these studies allow researchers to learn a great deal and underscore issues of importance to the purpose of the inquiry (Merriam, 2008). Selected were gifted readers, as a convenience sampling, from my gifted classes during the 2011-2012 and the 2010-2011 school years. Students officially identified as gifted by the school system and had been participating in accelerated English programs since middle school qualified for this study.

In qualitative research it is essential to collect data that sheds more insight into the phenomenon as indicated in the existing literature. The four students selected for this project were interviewed in depth for their reading and study habits asking specifically for time they spent in undistracted reading and studying. In addition, students were asked to fill out a template and journal their reading habits for a period of fourteen days, being careful to note if they became distracted and attempted to multi or partial task while reading and studying. Comparing teacher assessment results to the findings determined how much preparation time the student spent deep reading, undistracted, for the assessments.

Data from multiple sources were collected that included individual interviews of participants, participants' journals, researcher observations, and teacher assessments. This data allowed the study of deep reading to focus on holistic description and explanation; the researcher set out to uncover the interaction of significant factors characteristics of the phenomenon (Stake, 2008; Yin, 2008) of deep reading.

Scenic Heights High School does not have separate classes for gifted readers or gifted students. Rather, gifted students enroll in Honors classes designed for students who wish to attend a four-year college or university. In making my selection of participants, I perused my Honors Freshmen Literature roster from the 2010-2011 school years and noted the students who ended the year with an average of 95 or above. I followed the same criteria for my current freshmen, noting those students who ended the semester with a 95 or above. Twelve students qualified, nine sophomore and three freshmen. In order to verify that these students were gifted readers, I scrutinized their standardized test results of three tests: the CRCT, the ITBS, and the PSAT. Since the Scenic Heights School District does not have a designation of gifted reader per se, I narrowed the selection down to the students who tested 90% or better in reading comprehension on all three tests. This left me with five finalists, and I decided to use all five for the study, three sophomores and two freshmen.

I first contacted the parents of these five students by phone and explained the study and my request to use their children for the research. Four parents agreed to allow me to use their children; only one set of parents denied permission for their child to participate. The participating parents preferred that I discuss the study first with the participants before they discussed it at home. Therefore, I next talked to all four of the students, and they were eager to participate; they subsequently went home to discuss it with their parents. The final four came back affirming their desire to participate, and I followed up with a phone call to verify this affirmation. Of the four students who had agreed to participate, three are sophomore boys and one is a freshmen girl.

I followed up with two informal discussions with the participants, stressing the need for their complete honesty and integrity in this study. Chosen because of their academic success, I reiterated that I wanted to analyze the work habits that made them so successful. After their complete understanding of the study, I submitted the IRB paperwork with Kennesaw State University and permission forms with the Scenic Heights School District and awaited permission to move ahead. Once both institutions granted permission, I moved ahead with the study.

I first interviewed each participant one-on-one from my classroom and recorded the sessions. The first interviews covered how much time each participant spent studying, how much time each spent studying from a computer, the attitude each had about studying from digital text and print media, where each studies in the home, what each encounters in the study environment, and how each participant learned to read. I then gave each participant a two-week journal; each participant was required to document where he studied, how long and how often he studied, the environment of the study room, the use of technology during study sessions, and the kinds of distractions that pulled him away from studying. I next visited each participant's home during the two-week journaling period to observe each participant studying in his normal environment as well as the design and atmosphere of the study room; I also discussed the participants' work ethic and attitude with their parents. Lastly I procured teacher assessment results that overlapped with the journaling period from each participant's literature teacher.

Data Analysis

After I gathered all the data, I made verbatim transcriptions of the interviews, the journals, the visits and the assessments and entered the data into the Atlas software. The data

were subsequently analyzed using the constant comparative method of data analysis. One segment of data was compared to another segment to determine similarities and differences. Data were grouped together based on dimension, given a tentative name, and merged into its own category (Merriam, 2008). Thus, I initially open coded all my data sources separately: four transcribed interviews, four visits, four journals, and six assessments. I came up with seventy-five codes. I next grouped or axial coded the data together; axial coding or analytical coding goes beyond descriptive coding because it requires the researcher to interpret and reflect on the meaning of the codes (Merriam 2008). Finally I engaged in selective coding, a process that develops core categories, propositions or hypotheses (Merriam 2008), and discovered three main themes and seven subcategories of themes from my data.

Atlas. Ti: The Knowledge Workbench ®

Atlas.ti was the software I used to analyze and triangulate my data. Atlas.ti allowed a researcher to analyze, code, and crosscheck various types of data. According to designer Thomas Muhr (1995),

Atlas.ti's knowledge of management capabilities transfers data into useful knowledge. [It can] manage, extract, compare, explore, and reassemble meaningful pieces of data in creative, flexible, yet systematic ways. Users can connect selected passages, memos, and codes into building stones of emerging models using the program's graphical network editor.

Although based on the grounded theory approach, this software was created for all qualitative approaches and provides many helpful tools for qualitative researchers to analyze data received. For example, Atlas.ti can: manage, arrange, and rearrange material; code text

systematically and develop a system of code for research studies; retrieve and browse text on the basis of coding and the different ways the researcher has arranged the material; visualize findings in diagrams, graphs, and maps; create families and networks using the codes, memos, and quotations from data; print codes, memos, quotations, charts, diagrams and graphs; and write up the research piece by piece as you go along. Certain aspects of the research must be done by hand as no software package can be used exclusively. Other limitations include documents that must be in rich text or plain text formats, programs that do not have spelling and grammar check functions and require substantial time training. However, qualitative research is moving more and more towards the integration of software packages for the process of interpretation (Davis, 2008). I have acquired the software and installed it in my computer, and I finished training the last week of June, 2011.

I transcribed all interviews, visits, journals and assessments onto eighteen word documents. I uploaded each document into the Atlas software, which converted the files to a Rich Text file. From this file I coded each line of data for all eighteen documents. I analyzed the codes, collapsing them into axial coding until the three themes emerged and from which the Family Codes came. I concluded the analysis with three Family Codes and seven subcategories that I have discussed in Chapters 4 and 5 of this dissertation.

Positionality

I was in my 30's and employed in the business world when computers entered the work force, and I was in my 40's when they became more accessible and influential in our daily lives. When I began teaching in 2002, I was excited about a future with computers and wanted to impart that enthusiasm onto my students. I tested for gifted programs in my English and

science high school classes and took advanced classes throughout my high school career. I relate well to students who are challenged in this kind of classroom, but my life experience has also taught me that such classifications are by no means insurance to a successful, prosperous life. Parts of my teachings include the harsh realities of the real world, and I felt I could make a difference in these children's lives with my corporate experience.

Technology and its potential for education continues to fascinate me. Many times I have wondered what kind of a student and professional I would have become if these tools had been at my disposal. I am a huge advocate of technology, taking as many technology-based courses as possible, including an earned technology certification in Scenic Heights Teach21. I am a believer in project based work for my students and prefer such assessments over conventional tests.

However, while I am smitten by much of technology, I have a greater love: reading. I have found that reading on a computer is different than reading from a book. I do not concentrate as much and am inclined to surf the net or become otherwise distracted. If I want to truly engage in studying a book, I must tear myself away from all else and read with book in hand. My experience with Kindle, a handheld electronic reading device, has also been a different reading experience. Whereas I can read pleasure, fiction books on Kindle and enjoy the full range of sensory experience, I cannot read textbooks or study from Kindle. I abandoned buying electronic textbooks for printed ones because my mind simply seems to refuse to make the transition. Clearly, I am a Digital Immigrant, one who was born before computers and had to learn how to use them in adulthood (Tapscott, 2009); I still attempt to navigate through this digital world with my pre-established habits of reading and comprehending print media firmly

entrenched. Interestingly enough, I read more fiction books from Kindle than I do from print text. Also, I do not enjoy reading from the Kindle program on a laptop or desktop computer because I cannot engage myself with the material. Clearly, this is not a problem for me on the portable Kindle device.

At first I thought my habits were learned because I was a Digital Immigrant. My review of the literature has uncovered that this is not just a trend among Digital Immigrants, and that Digital Natives may suffer from the same handicap. As much as I am a proponent of technology, I am a bigger proponent of deep reading. Therefore, I had to be cautious that I did not overemphasize the research on deep reading, research based on brain studies that are saddled with questionable findings. I had to be very aware of how I interpreted my students' study habits and not be quick to isolate deep reading or lack thereof as a conclusion of my research. That is, I had to acknowledge that a gifted reader could achieve academic success while studying and reading distracted or partially tasking on the computer, as surely as older students, namely me, must work bereft of distraction. Admittedly I entered the study biased, believing that technology is having an adverse effect on a youth's cognitive development in terms of deep reading. As such I had to be cautious that I was not too skeptical about students who were multitasking or comprehending the material well without deep reading checking and rechecking with my peers to determine if they interpreted my observations the same way. Bogdan and Biklen (2007) assert that it is difficult to write and research without bias that reflects one's own experiences and values. Merriam (2009) cautions that a close proximity to the data may hinder objectivity and significance of the study, and he calls upon such researchers to develop "epoche," the ability to divorce oneself from past experiences and the

research situation. He proposes that the researcher qualify personal interpretations and conclusions by carefully explaining to the reader his or her assumptions and biases regarding the research being undertaken, and I have attempted to describe my own biases. As I wrote reflective pieces careful to temper my enthusiasm with my bias, filtering my reflections for a professional, objective analysis of my students challenged me constantly. In order to alleviate any ramifications from my bias, I did the following: consulted members of my committee for a peer review; consulted a cohort of my fellow English teachers in this program for additional feedback; discussed my findings with the participants of this study; and conferred with my fellow English teachers at Scenic Heights High School to make sure that my conclusions were objective and free of my bias.

A crucial element to the success of this study was the honesty with which the participants disclosed their reading and studying experiences. I have taught the four students selected for the study, and I get along very well with all of them; clearly, this kind of a relationship potentially challenged the dynamics of our interaction as it related to the integrity of the study. My relationship with them was not part of the criteria, only grades and gifted status, so it was a coincidence that I got along very well with all four. When initially approached, the participants were both intrigued and excited. One student was honored and he thanked me for asking him, and another student frequently visited my classroom anxious to schedule the interview and begin recording in his journal. They also asked a litany of questions about the study so they could help me discover what I hoped to find. In order to counter their desire to please me and throw some dissonance into the teacher-student relationship to avoid skewering the results, I nurtured a relationship between the study and the student and de-

emphasized a relationship with me. They were told it could prove to be very helpful to future students who have aspirations of attending a four-year college and excelling in a career because of their success at school; this extra bit of motivation inspired them to become committed to the cause. As gifted students, they all have an early capacity for altruism (Clark 1997) and a deep desire to help others, so I used this as a way of committing them to the integrity of the results. I conducted two one-on-one sessions with each participant prior to beginning the study, and I stressed to them the importance of their work ethic and integrity. I stressed that the students had to be very honest for this study to be successful and helpful; otherwise, the research would not be beneficial to other students or to me as the researcher. By fostering an allegiance to the study, the students were more committed to safeguarding the integrity of the results.

Confidentiality and Ethics

The students participating in this study underwent the rigorous IRB requirements of Kennesaw State University and the research review process of the Scenic Heights School District. Both institutions granted approval before the study commenced.

I consulted both the parents and the participant once the final participants were selected with a more in-depth purpose of the study, the need for me to be on site to observe, and the need for current data. I related all issues of confidentiality, assuring them that the results will be used only for this study. All names used in this study are pseudonyms. The parents and students signed agreements from both Scenic Heights County and Kennesaw State University. The Scenic Heights School District required the signed document be retained in the local office, and the IRB papers are among my research paperwork to be locked away for three

years after the study is completed. Once the three years have passed, all documents relating to this study will be destroyed. Providing all participants with confidentiality was a paramount issue that I constantly addressed and assessed as I conducted the research study.

Credibility and Transferability

One of the best-known methods for shoring up the internal validity of a study is triangulation. Triangulation involves gathering all the data gathered from multiple methods and checking it against one another to see if it merges into one point (Merriam, 2008). In this study, the literature researched, the observations made, the journals from the students, the on-site visits, and the interviews conducted were triangulated to determine if a fixed point, such as deep reading, exists. This process is called chain of evidence (Yin, 2003) and audit trail (Merriam, 2008). This helps the researcher establish credibility. Credibility deals with the question of how congruent the findings are with reality. That is, is the researcher observing or measuring what they think they are measuring? Another form of credibility was member checking. For this study, I allowed cohort members to read and discuss the data gathered and offer their input on the findings; I also incorporated peer reviews, which is a self-regulated process of review by established members of the academic community who determine if an article or dissertation is suitable for publication. My dissertation committee served as my peer reviewers throughout the evolution of this research.

A study can be replicated if it is reliable. This is problematic in the social sciences because human behavior is not static. Replication of a qualitative study may not yield the same results. This does not discredit the original study unless the original data can be directly contradicted. Therefore, the strength of a study's reliability depends on triangulation,

reliability, investigator position and audit trail (Merriam, 2008) that I conducted throughout the study. This study's audit trail included the documents coded on Atlas, transcriptions of the recorded interviews, a discussion with the participants on the findings, a discussion with my English cohort on the findings, and a peer review by my dissertation committee.

Transferability is the extent to which the findings of one study can be applied to other situations. Again, this is problematic in qualitative research since a single case or small, nonrandom, purposeful sample is selected because the researcher wants to understand the particular in depth, not the general. To increase the probability of transferability, therefore, the use of thick description provides a rich, highly descriptive, detailed presentation of the setting and the findings of a study (Merriam, 2008). This meant I had to provide a detailed description of my setting, the participants, and the findings with adequate evidence presented in the form of quotes from interviews, field notes and documents.

Therefore, credibility and transferability are best provided in qualitative research through triangulation, checking with members of the study, adequate data collection, researcher's position, peer review and examination, audit trail, and thick descriptions (Merriam, 2008). This research project followed all these tenants for this case study.

In addition, I completed a reflective journal about my own experiences with the participants. These entries enabled the reader and me to see how my own experiences, ideas and biases shaped the results of my research and allowed me to be as descriptive, thought provoking and controversial as I needed to be. This helped me understand the nature and context of my thoughts and beliefs.

CHAPTER IV

FINDINGS

Background Information

Students were selected from a purposeful case sampling of gifted students as classified by the Scenic Heights School District. Three standardized tests results were collected and analyzed before a final selection was made: the Georgia Criterion-Referenced Standardized Test (CRCT), the Iowa Test of Basic Skills (ITBS), and the Preliminary Scholastic Aptitude Test (PSAT). While the Scenic Heights school district does not have a designation of gifted reader per se, gifted students who scored highest in reading comprehension were used in the final selection of the four students. It is important to note that only the reading comprehension scores were obtained and evaluated for this study. It is also important to note that the students took the PSAT exam as freshmen, and the test is designed for sophomores.

Once chosen for the study the students were interviewed by the researcher and visited at their homes for an in-depth look at their home and study environment. Finally, students were asked to record their study habits and preferences for two-weeks in a journal provided by the researcher. The researcher then obtained assessment results that overlapped the two-week journaling period from the students' teachers. The researcher analyzed all the data together to determine the students' heuristic beliefs as it related to their study environment and their study habits with an emphasis on any presence of deep reading. This research is a single case

study drawn from multiple sources. Data collection included a total of four interviews, four home visits, four two-week journal entries, and six teacher assessments of student work.

This chapter is divided into two parts. The first part details each student's beliefs, environment, study habits, and assessment results revealed through initial interviews, home visits, student journals, and assessment results obtain from their teachers. The second part elaborates on the themes that emerge after analyzing all the data.

First Student Participant: Molly

CRCT Reading Comprehension Results: 882, Exceeds Standards

Eighth Grade ITBS Results: 92%

Sixth Grade ITBS Results: 97%

Freshmen PSAT Results: 83% higher than other sophomores nationally

Initial Interview

Molly is petite, studious, and very disciplined with her study habits. I interview her in my classroom one afternoon, and she affirms that she has to have it absolutely quiet while she studies. "I need to be myself," she says. "I can't be in a public place in my house or go out somewhere." She pauses, carefully considering at what point she becomes distracted. "If I hear the TV on in the other room or if music is playing somewhere, I can deal with it. But I would rather have it quiet." She says that she has a low tolerance for any kind of noise and while some muffled sounds can be heard through the walls and endured, she cannot study if it gets too noisy. "Noise travels through my walls," she tells me with a giggle. "For instance, I can't study when my mom is making all that noise in the kitchen down below me. It drives me crazy." Molly

studies with her doors closed to minimize the sounds nor does she listen to her iPod nor have any kind of music playing in the background.

Molly does not like to study with computers and will do so only if she has to. "I prefer to read old-fashioned books," she says. "I need something tangible in my hands so I won't get distracted. When I look at a piece of paper and can go with a highlighter and underline important facts, I understand it better than everything that's going on the computer screen at the same time." By that she means the ads and everything else that would pop up and disturb her. She also admits that she has an eyesight problem. "I've got really bad eyes and the screen will get too fuzzy and all." However, she emphasizes that she likes to have something in her hands to better enable concentration. "I won't always print an article off the computer, so I do some reading on the computer. But I don't like it." She relates that her room is very orderly and set up to maximize her concentration needs. "I have a separate room that's my own for studying." She laughs when says that her older brother is not allowed to study in her study room.

Home Visit

Upon my visit to Molly's home one evening, I find the house located at the end of a cul-de-sac in a middle-class subdivision. It is noticeably one of the biggest houses in the subdivision. A two-story dwelling that sits amid a well-manicured lawn, front porch lights light the way down the walkway to her front door. On both sides of the front door are two sets of wicker furniture. From the windows I can look in and see a well-lit foyer that is clean and free from clothes, books or any other teenage accoutrements strewn about. Molly's mother lets me in and greets me warmly. We chat for a few moments as I take in more of the surroundings. The

foyer empties into a wide hallway that takes people back to the living-room. Above us is a bridge that connects one part of the upstairs to the other. "Molly gets half of the upstairs all to herself," her mom tells me with a laugh. "Two rooms and a bathroom."

Molly then comes down and leads me upstairs. She first takes me into her bedroom that has a large double bed as its centerpiece. Blanketed with a black-and-white spreadsheet, the bed is positioned to get a good view of the 20" flat screen TV sitting on her dresser drawers. "Sometimes I study in bed, but not very often. If I do, the TV's off." What are not in her room are teenage posters of current or past celebrities or anything else stereotypically associated with teen-age girls. The room is clean and organized. On her way to her study room, she leads me through her sparkling clean rectangular bathroom replete with shower and sink that connects her bedroom and her study room.

Again, the study room exhibits the same Spartan-like conditions of her bedroom. Smaller than her bedroom and square shaped, a large, black rectangular table juts out from one wall opposite the door into her study room monopolizing the area. Her laptop is open on one corner of her desk displaying her Facebook page. On the other corner sits her literature book, and in the middle of the desk is a yellow notebook with some papers inside it. Also on the desk off to one side is a daily calendar ostensibly filled with homework assignments. I also notice the journal she is keeping for me in another area.

Molly does not study while I visit her room. Rather, she chooses to demonstrate. "This is where I do most of my studying," she says, sitting in her chair presumably to illustrate her studying poise. "My laptop is always open and my books are here in front of me." She tells me

she will always close the door to her room but will sometimes leave the door to the bathroom open. "I can't take any noise," she insists, comparing it to a tomb.

Like the rest of the house, the room is free from clutter or any potential visual distractions. A ceramic butterfly decorates the wall above the tiny bay window that sits behind Molly as she studies. Pictures of her and her family sit atop some dresser drawers in one corner, and a tri-fold, six-foot stand is filled with more framed family photos. "Those photos are mostly my mom's and are of me and my brother. I'm slowly replacing them with my friends," she finishes with a smile. Directly behind her are some drawers where she keeps her notebooks. In addition, brightly colored cups are lined up along the edge of her desk against the wall filled with pens, paper clips and magnets.

"My mom taught my brother and me how to read when we were little," she says. "We would lie in her bed, it would be real quiet in the room, and she would read to us. Because she was a reading teacher, she would question us about the stories afterwards. You know, things like plot, rising action, and character. Sometimes my dad would be with us, but usually it was just us. We had a strict reading time and a strict TV time. We never did them at the same time."

Molly concedes she can handle more distractions when she reads for pleasure. "I can read in my bed or down in the living-room. I can read with more noise, but I can't study and concentrate with any noise or a lot of people around." Molly is the only one of the four who frequently babysits and will study after she puts the kids down to bed. "If they're up, I can't study. But once they're in bed, I can study for at least half an hour." She states that she would normally do her math homework then. "I can't read and concentrate when I'm babysitting."

Student Journal

Molly's journal records that in the 14-day period, she studied on 13 of those days. She averages 36 minutes of study per day, but there were a couple of days on the weekend when she babysat or spent a couple of days quickly glancing over her material. Seven of those days were exclusively quiet with no music in the background. On the other days, music was only playing for part of her study sessions, so she gave herself some quiet time each study session. Family distractions such as Mom vacuuming or being sick, noise around the house, or the TV being on were noted during her sessions.

Her journal shows that she listens to music when she works on a paper or completes interactive work on the computer. For her reading assignments, she does not listen to music. However, she mentions that she actively checks her text messages throughout most of her study sessions but does not allow herself any computer time other than to study. When she does study on the computer, she did not surf or deviate from the assignment. She did babysit one of those nights, but her study session was brief: three minutes of quiet time once she put the kids to bed.

Molly's journal is very precise and detailed. She carefully notes when she is able to study in complete silence or what noises around her distract her. She identifies the noise and indicates if she had to cease studying or if she could study with the distraction. She also lists the amount of time she spends on each subject and whether she listens to music or watches the television.

Assessment Results

Prior to a multiple choice literature test she took, Molly writes that she did not listen to music but studied her notes and the story although she could hear family distractions in the background. She made an 85 on a very difficult standardized test for literature, four points above the class average. On a subsequent essay test a week later, she made a 100 that was 5 points above the class average. Although this test was open note and open book, she had to organize herself well enough to answer five comprehensive questions in the allotted time.

Second Student Participant: Miles

CRCT Reading Comprehension: 920, Exceeds Standards

Eighth Grade ITBS Results: 97%

Sixth Grade ITBS Results: 99%

PSAT Results as a Freshman: 85% higher than other sophomores nationally

Initial Interview

Miles tolerates the least distractions and noise of the four students when he studies. He is a very affable and stoic teenager who plays football in the fall and wrestles in the winter. Similar to Molly, Miles has to have it absolutely quiet when he studies with little movement to distract him as he studies. Less, even, than Molly. "I try to find a comfy spot like a couch or a table," he tells me from my classroom during our initial interview session. "It depends on if I'm sore from practice or not if I'll lie down on the sofa or sit at a table." Miles acknowledges that he can hear the muffled sounds of his family from outside his study room doors including the TV, but these sounds do not bother him. "I like to listen to music when I study," he said. "Mostly instrumental stuff. It helps me concentrate and close off all the other sounds." Miles

further acknowledges that he cannot concentrate if he is surrounded by a lot of activity and needs a room, a private space, that he can sequester himself to for better comprehension. “I notice a difference when I do this,” he assures me.

Miles prefers to study from books rather than the computer. “It’s easier, I think,” he says. “I don’t know why but with a [computer] screen you just kind of seem to focus on everything, but with a book you can look at the word. I can just understand it better and comprehend it better from a book.” He also says that while he is studying, he will keep his cell phone off to one side and use his computer only if he needs to take notes or “if there’s an email or something.”

Home Visit

Pristine is the word that comes to mind when I visit Miles’ home one evening. I park my car on an expanse in front of two double garage doors and walk down a well-lit path to the front door. Peering in through one of the narrow beveled windows that flank the door, I can see a spacious foyer and beyond that an even more spacious living room with a giant, flat screen plasma TV standing prominently in the far corner of the room. The television is on to the show *House*. Miles lets me in and introduces me to his parents who meet me in the foyer. To my left French doors separate me from an office which later turns out to be Miles’ study room. To my right is the dining room with a large table, large enough to sit eight people comfortably. Four places have been set out as Miles’ mother insisted I come for dinner as well. The aroma of pasta wafts around me as the family leads me into the living room.

As Miles’ dad mutes the TV sound, I take a seat in one of two very large and very plush chairs that face the TV. A small table separates the chairs where Miles’ dad sits a glass of wine

down for me. Perpendicular to the chairs are two large, equally plush sofas. One sofa flanks the wall and the other sofa marks the boundary of the living room; beyond it is the kitchen. French doors lead out into a patio next to the TV, but it is dark so I could not make out the details.

“Miles has always been motivated to do well,” his parents tell me over the course of the evening that includes dinner. “But we make no excuses for kids. It is on them to succeed, not the teacher, and it is on the teacher to push the kids in that direction.” Indeed they have pushed Miles, their only child, but he has also been self-motivated. He says, “I challenge myself with the toughest classes every year. Ever since I was tested gifted, I felt like I should work hard to live up to my potential so I can help people. So I always take the toughest courses to challenge myself.” His parents concede they were a bit worried that Miles takes only honors and AP classes and plays sports, but he has risen to the challenge with a strong work ethic and a disciplined schedule. “I tell parents it can be done,” Miles’ mother says. “Just don’t make any excuses for them, and they will do it.” And without being prompted, Miles clears the table of the dirty dishes when we finish eating as I talk to his parents.

I next meet with Miles privately in his study room beyond the French doors. Like Molly, his room is bereft of any teen-age accoutrements. In fact, the room fits the décor of the rest of the house. A white sofa covered with pillows abuts one wall and sits opposite the tiny, black desk where Miles works. The only signs of a teen-ager’s presence are his schoolbooks on the desk and a book bag next to the desk. The walls are decorated with family pictures, many of them from the parents’ families but a few of Miles as a toddler growing up. He shows no embarrassment as I look at them. A rectangular coffee table sits in front of the sofa, and a chair

sits next to the desk for me to sit in. As I take a seat, the whole room has the feel of a professional office.

Miles had closed the French doors when we first entered, and through the glass I can see his parents cleaning up the rest of the dining room and hear the muffled sounds of them moving about and talking. His dad had told me earlier that Miles could study upstairs if he wants to, but he prefers to study down here because there are no distractions. "Upstairs there's another wide screen TV and a stereo system," Miles informs me. Then, smiling, he admits that he gets very distracted when he is up there and cannot study. "I'll start playing them, you know, video games or a show, and then won't study." He needs a complete separation from distractions, and this room has become his sanctuary for concentration as evidenced by the lack of technology except a laptop computer and his cell phone.

"I like to listen to instrumental music because it helps me concentrate. I'm not as motivated to read what I need to study, and music helps me stay motivated. The less motivated I am, the more easily distracted I become. The more the noise outside this room bothers me, and the less I can read. So I listen to music all the time."

Unlike Molly, Miles cannot check his email or text messages as he studies. "I simply can't be distracted," he tells me with a shake of his head. "I have my computer here and use it to study by when I have to, but I prefer a book, something I can hold in my hands 'cause it helps me concentrate. The computer distracts me, and I never check Facebook or email when I study."

And like Molly, Miles can pleasure read anywhere. “It’s because I’m more motivated to read that,” he observes. “I can block things out with something I want to read, so the TV or the stereo don’t bother me.”

Student Journal

In his two-week journal, Miles consistently gives himself a five-minute break to check his email. But he allows himself no other distractions as he studies. He is by far the most disciplined and focused student of the four chosen for this study; in fact, he reiterates a couple of times that he has discovered he can comprehend better in a quiet, undistracted environment with nothing else in front of him but what he is studying. He did not note that he listened to any music during those two weeks. Miles studies an average of 60 minutes per night for the two-weeks, but two of those nights he did not study because he participated in a wrestling tournament.

Miles’ journal entries are somewhat inconsistent. For the first week he makes very detailed entries noting how much time he spend on each subject, what he is doing, why he is doing in, and what time he is doing it. For the second week he simply notes the subject and how much time he spends studying that subject. He does write in each entry that the only break he allows himself is five minutes to check his email.

Assessment Results

When he took an AP World History test during the course of this journal, he scored a 96 that was well above the class average of 78. These are extremely difficult tests because they prepare the student for a college level exam that will give them college credit if the scores are high enough.

Third Student Participant: Bennett

CRCT Reading Comprehension: 860, Exceeds Standards

Eighth Grade ITBS Results: 94%

Sixth Grade ITBS Results: 95%

Freshmen PSAT Results: 74% higher than other sophomores nationally

Initial Interview

Bennett is above average in height with a shaved head and a passion for a multitude of sports that he cannot play as much as he would like to. "I had a bunch of injuries in football and baseball when I was younger," he tells me. Today he plays basketball, a sport he has played since his first year of high school. Bennett is fiercely competitive in the sport, blocking aggressively, stealing the ball, urging his teammates on, and pumping his fists and swelling his chest when he makes an impressive offensive or defensive play. This competitiveness carries over into the classroom.

Bennett is the only student in this study whose family is not conventional. He does not have a father, and there is not one listed on his birth certificate. He once told me that he dreams his father "likes to go off and fish in the quiet like I do." I did not press the family for any details. I do not feel there is any abuse or abandonment in his background. The mother has two boys by different fathers, and she simply chooses not to marry.

While Bennett says he needs quiet to study, he does not need to sequester himself off to a quiet place with no activity around him. "I need to listen to music because it helps me concentrate," he says one afternoon from my classroom during our initial interview. "I like to listen to country music mostly, but sometimes I'll listen to rap."

He remarks that his brother, grandmother or mother will distract him from studying. “But that’s why I listen to the music. So I can tune them out.” He says that he is usually downstairs studying in his room but can hear their noises from upstairs. He admits that he only reads for fun when he is bored, but the noises that bother him when he is studying do not bother him when he is reading for pleasure. “I just can push right through it,” he tells me confidently.

Bennett admits that he will text message when he studies, but he will only text message “a couple of times” if the studying involves reading. However he has different attitude when he has a bigger assignment or a test the next day. “I turn my cell phone off and set it aside. I also study longer and listen to music. It helps me concentrate.” He also tells me that he prefers to study from books.

Home Visit

Bennett’s home is not part of a subdivision; it sits off a two-lane country road a couple of miles from the school. The house is ranch-style. I park my car on an expanse in front of a carport, and Bennett opens the side door to let me in to the kitchen. I am glad. The front of the house is dark and uninviting, and I am not sure which door to approach.

Bennett is the only student who did not take me to his room, the place where he states he does most of his studying. Rather, I observe him from a breakfast room next to the kitchen.

The breakfast room (or dining room) is off to my immediate left. Sitting in the middle is an enormous round table where the family eats most of their meals. Behind the table is the kitchen. Behind the kitchen and in front of me are two sets of stairs facing each other that lead to the downstairs basement. Beyond the kitchen on the same floor is a living area, but it is dark

and I cannot make out any details. As I walk in there is also another closed door to my right that empties into another living area; a dog is on the other side of the door whining while scratching the wood.

Bennett is finishing dinner with his grandmother when I arrive. He apologizes for being late, saying that basketball practice had gone over. His grandmother offers me something to eat, but I decline and sit next to her. Bennett sits on the other side of her.

I ask Bennett if he normally studies in here. "Now I do," he answers. "There isn't enough light in my room, so I have to come in here." During the visit I did not tour any other part of the house and wondered if they simply did not want me to see parts of it. Since the front of the house is so dark, I also wonder if they are keeping the electricity costs down.

Bennett quickly finishes his meal, pushes his plates aside, and grabs a math book and notebook from a book bag lying at his feet. "I like to listen to my iPod when I'm in here studying," he says as he flips to the page where he has to work out his problems. "But I've sort of misplaced it, so I can't use it now."

While Bennett and I talk, his grandmother gets up and cleans the table and the kitchen. Bennett's younger brother frequently scurries up and down the stairs. Throughout this activity Bennett works undisturbed on his math problems. I observe that there are moments where he completely focuses on the task at hand and tunes out the noise and distractions that surround us with the same look of intensity that I have noticed from him on the basketball court. When asked a question or responding to a comment, he looks up from his studies and replies with no source of irritation in his voice. He repeats much of what he says in the initial interview as he completes his math problems.

At some point his mom comes in and apologizes for being late. "There was a wreck on the interstate and I got stuck in traffic," she says breathlessly, and she gently collars Bennett around the neck and kisses him on top of the head. While Bennett studies his math, we talk a little about Bennett's childhood. "He could talk when he was only one," she tells me with pride. "The doctors couldn't believe it. He was walking before other kids his age. He was always precocious like that." Staying focused and disciplined with his studies is not something with which Bennett's mother ever has a problem. She read to him when he was very little in an area that had no distractions in it. "It was hard for me to do after work. Lots of times I had two jobs, but I did it." Bennett would then attempt to read so he could figure out the words himself. "He's just always been like that." She reiterates with pride that Bennett would always do his homework without any prodding. "Not like his younger brother," she mentions with a shake of her head. "But they have different fathers, and the doctors told me I had to quit expecting the same thing from both of them."

All the while his mother and I converse, Bennett never once breaks stride from working his math problems. Again he focuses with the same look I remember seeing on the basketball court, punching numbers in his calculator and resolving the problem before him. This in spite of no iPod to block out the distractions which include his grandmother washing dishes and cleaning the kitchen, his younger brother coming in to meet me and scampering around the house with the youthful energy of a 12-year-old, and his mother and I chatting through-out.

Student Journal

Bennett's journal notes that he had a routine while he studied, though his routine was not as disciplined as Miles'. On three nights he specifically mentions that he listened to country

music while studying, but on other nights he writes that he heard the family distractions but studied without music. And he only sent text messages on two nights while studying. At no time in the journal did he ever indicate he studied on the computer nor mention where he studies; he also did not list the amount of time he studies for each subject on each night.

Bennett's journal is the least detailed of the four participants. If he is not listening to music, he will note what distractions disturb him. While he does not specifically mention where he studies – his room or the breakfast room – he will note if there is activity or noise from the kitchen. But it is not known if he hears these from his room or the breakfast room.

Assessment Results

When analyzing Bennett's teacher assessment through the journaling period, he made an 80 on a standardized quiz from *Hamlet* and a 90 on giving a memorized, one minute speech. The day before the *Hamlet* quiz Bennett lists that he spent an unspecified amount of time studying the play while listening to music.

Fourth Student Participant: Jeff

CRCT Reading Comprehension: 860, Exceeds Standards

Eighth Grade ITBS Results: 91%

Sixth Grade ITBS Results: 94%

Freshmen PSAT Results: 74% higher than other sophomores nationally

Initial Interview

Jeff is perhaps the most well rounded of the four students in this case study. He is a young man of average height, blond hair, and piercing blue eyes that exude a confidence not found in many teenagers. He plays in the band, runs track, is active with the Future Business

Leaders of America (FBLA), DECA, and is president of the sophomore class. He is also taking as many honors classes and AP classes as he can during his sophomore year. "I love work, and I love challenging work," he once told me, his eyes sparkling in merriment.

In my initial interview with Jeff in my room, he brings a sandwich and a drink that he eats while we talk. Unlike the other students, Jeff has no preference when it comes to the source of his reading material. "Because I see it as getting the information you need to no matter how you're getting it. You're still reading it one way or the other. I mean, you could spend money on getting a Kindle or you could read the book. It's just....it's an opinion for most people, and I don't see it as something more important than the other."

He does concede that he can get easily distracted on the computer. "In some cases if it [what I'm studying] is on the computer, I'll end up browsing the internet and catch myself. It's like, you know, after an hour or so of reading you'll find some interesting fact and you'll go to that site trying to find some background history on it and then one thing leads to another and, you know, ten minutes later you're off topic and you have to get back down to reading." He finds that studying from the computer he can get information on things that he does not know about, but with a book he has to base it off previous knowledge "unless I had another book or another source to look up information I was curious about." While he reiterates that he does not have a preference, he comments that "as far as getting more specific detail goes, I think being and working on a computer is more beneficial 'cause it's at our fingertips; it's easy."

For Jeff the amount of distractions he can handle depends on how much he needs to comprehend. "If I'm reading to gain details for like a class, then it has to be quiet because I can really focus on it instead of hearing something in the background." Otherwise he will find

himself concentrating on the noise rather than his reading. Again, the more in depth he needs to study, the more reclusive Jeff becomes. "I shoot for getting a quiet area," he said. "This might mean sometimes at three in the morning I'll have to wake up and start again. But my study area can't be cluttered. It must be clear so I can focus on one thing instead of fiddling around on the side. So it's like, you know, a pile of books on your left. You have the one you're focusing on right in front of you and whatever you need to write on, too. For me it has to be that one specific thing. Not all the books are open."

Jeff prefers instrumental music for optimal learning and concentrating. "That way I won't be bothered by every little noise that happens around me." He takes study breaks every 15 or 20 minutes for only a couple of minutes to check his email, text messages, get a drink, or walk around. He does not like to study in his room either. "I actually find that if I'm in my room I'll find something to do like, you know, put something away, put something somewhere else, or fix something. There's a bar table at our house that's in a room nobody usually walks through, and I'll put my books on the bar table and usually have the computer on one side and books open over here. So it's back and forth, but it's in that one room." Jeff says he needs to be active when studies to keep the blood flowing. "Otherwise I get too relaxed and can't concentrate."

Home Visit

Jeff lives in an older area of the district off a busy two-lane road with gas stations and other small businesses across the street and next door. New homes mingle with old homes, and I have a hard time finding his driveway in the dark. The house sits away from the street, and I drive past it a couple of times.

I park my car next to a mid-70's Impala that takes up part of the driveway. Assorted bikes and helmets litter the yard. I step over a school sign – school crossing – and knock on a wooden door and wait and wait. A basketball stand stands off to one side of the driveway, its net tattered and worn from use. The front porch is dark and had a number of items lying about. I knock again, wondering if anyone is home.

Jeff comes out holding a large white dog by the collar. Assuring me he is friendly, I let the dog sniff my hand and pet its head before following Jeff into a large family room that has a pool table in the center. We walk up a couple of stairs into a TV room where older, plush sofas flank the walls in an L-shape around the giant screen TV that is not high definition sitting in the corner. I follow him into the next room. To our right is the kitchen. To our left is the bar room where Jeff guides me.

A rectangular room that is by far the busiest of the four study areas I visit, the bar occupies one side of the wall with a number of glasses hanging on an overhead rack. I do not see any alcohol bottles out. As I enter the room I meet his younger brother sitting on the floor working with a computer from a tiny table. A sofa flanks the wall opposite the bar, and clothes, books, and an empty Gatorade bottle are strewn about. In one corner of the room sits an old dentist chair that Jeff says his dad bought before he was born. The chair has a number of dentist instruments and a spitting sink. Standing behind the bar is a six-foot female mannequin dressed in a t-shirt that has symbols from Christmas, fourth of July, St. Patrick's Day, and other holidays. In the next room is the foyer of the front door, and in the corner stands a four-foot, six-legged wooden bug meant for draping things over.

Jeff takes his place behind the bar. On one side of him is his computer. He grabs his book bag and pulls out his World History book. "I don't have much homework tonight," he says. "I've got to write two secret codes like they did in the Ottoman Empire for AP World History. That's pretty much it."

Jeff stands when he studies, even when he is reading. "I like to be active," he explains. "Sitting is for relaxing. Standing is for working, and it keeps me focused." Indeed he stands the whole time that he works on the secret codes. At times he is very focused, and at other times he stops and volunteers some information to me. While he studies his dad prepares supper in the kitchen and comes into the room to occasionally scold Jeff's younger brother for not studying. His movements in the kitchen are revealed through a wall of mirrors, divided into 8x8 squares, which is very noticeable from Jeff's vantage point. Eventually Jeff's twin joins the melee in the kitchen, and the clattering of pots and pans with two people traipsing back and forth into the television room resound throughout the room. I ask Jeff if he normally concentrates through this.

"I like playing study music from YouTube," he says. And to demonstrate, he brings up Study Music on YouTube and shows me a vast array of sites that offer music to relax and study by. "When I listen to that, it helps me block out the noise." He is not listening to it currently because I am there.

Soon the TV can be heard from the television room as Jeff's dad and twin brother settle in to eat and watch TV. Later on his dad comes back in and helps his younger brother with his homework. All the while Jeff works undeterred. "If I ever find my mind wandering, I'll take a

break for about ten minutes. I'll lift some weights, fix something to eat, hang out in the TV room. Then I'll get back to it better. I've found that works best for me."

Jeff admits that this is not the optimal environment that he studies in. "If I know I have a lot of reading to do or a big test, I'll get up like at two or three in the morning and study. I find I do much better on the test that way." He will listen to the study music from YouTube and study while standing behind the bar and when no family mills about to disturb him.

Student Journal

During the 14-day journaling period, Jeff writes that he listened to music only on three of those days. He is able to study in the bar room most days, but had to move on one of those days to a quieter place where he could read and concentrate. He notes that on another day he gets up at 2 a.m. to complete his homework. On such days he has either a test or a big assignment due. Jeff does not consistently record how many hours a day he studied, but he does note that he spends four hours studying for his AP World History test two nights before and skims the material the night before.

Jeff makes careful notes of his daily study habits. He notes what he studies and where he studies. He is not consistent on how much time he studies each night or for each subject, but he does note how much time he breaks and what he does during his breaks.

Assessment Results

For his AP World History test he took during the duration of this project, Jeff made a 78.5 out of a class average of 78. He shrugs it off. "You don't have to pass those tests to make an A in the class. If you do the reading and come in prepared to participate in the class discussions, you can do well in that class." For his literature class, he scored a 71.5 on a *Hamlet*

quiz, .5 above the class average of 71. He documents that he read *Hamlet* several nights during the journaling period. Again, Jeff shrugs off the results. "I do not like Shakespeare," he says. When I had him as a freshman last year, he expresses the same sentiment about *Romeo and Juliet*. We talk about it because I had noticed he did not do well on the assessment I gave him last year for that Shakespearean play; in fact, that was the lowest scores he made all year.

FINDINGS

Three themes emerged from this study:

1. Each student needs to be isolated in a *Most Restrictive Study Environment* the day before a major test or project is due;
2. Each student needs to surround himself or herself in an *Artificial Environment*, induced by music or absolute quiet, the day before a major test or project is due;
3. Each student needs to create a *Retro Environment*, free from dynamic interactions with technology and text, the day before a major test or project is due.

Participants' Attitude

The Most Restrictive Study Environment

The first theme is the need to be isolated from everyone in the household while they study. The greater the need to learn the material, the less distractions and activities with which they will surround themselves. So, if the stakes for learning the material are higher such as taking a major exam or writing a major paper that is due the next day, students sequester themselves away from other family members while they study; in short, they create a Most Restrictive Study Environment for times when optimal concentration and learning must take place. In discussing these strategies with the students, they inform me that they are focusing on one

subject because it helps them do better on the test or project the next day, and they want no outside disturbances.

In the case of Molly and Miles, they find this environment desirable even if there is not a major test or project due the next day. Their journal entries indicate this, verifying much of what they told me in our discussions. "I close myself in here," Molly told me in her carefully apportioned study room that has nothing on the walls or around her to distract her. Molly is totally secluded from her family. Because she occupies one-half of the upstairs, there is no reason for her family to traipse to or by her room. She not only has a room to herself, but she has a whole section of the house that no other family member needs to visit. She is the most secluded, and she is the one who needs the most consistent seclusion to study. "Noise and people bother me," she said with a shudder. "When my mom's cooking in the kitchen, I can hear everything. So I have to stop studying until she finishes."

Molly's study room is free from clutter and posters. Everything is laid out on her desk, and she has plenty of supplies. In brightly colored cups she keeps paper clips, pens, and pencils. In drawers behind her she has access to extra paper, notebooks and reference books. On the dining-room table that serves as her study desk, she has her laptop, notebook and schoolbooks in places that she can easily access. "I like to spread out," she also said, spreading her arms to indicate the width and length of the dining-room table her parents provide for her. "I put everything where I need it and can get to it. I don't want anyone disturbing me, coming up here to bother me, or anything like that. I have to be by myself. I have to have it quiet. I can't work otherwise." She sits in behind the table in the middle, well within arm's reach of whatever

materials she needs and with enough space to accommodate whatever materials she needs in front of her.

Similar and even more restrictive is Miles. While the design of Miles' house does not afford him the exclusive use of an entire section, he studies in an office space downstairs that is exclusively his. The décor of the room blends in with the rest of the house; that is, it is not a "romp" room where teenagers come in to horseplay, play video games, and hang out. The furniture is expensive, including a china cabinet showcasing a collection of miniature people and animals made of china or porcelain, and the room commands a quiet respect. In fact, the room has the look and feel of a professional office space. "I comprehend better when I'm in here," Miles said. He admits he has a wide screen television and stereo system upstairs, but he will not study up there. "When I see them, I want to use them," he says with a smile. "I can't be around them or I'll let them distract me." Miles will not study at all outside of his study room, and no one is allowed in when he is studying. "I really do comprehend when I study in here. I'll just listen to some instrumental music and study."

Family movement can be seen through the transparent glass covering the French doors. Miles' desk, though, sits in a corner of the room facing two blank walls. Family photos surround him well above where he sits. Therefore, he is able to focus on his studies whether he is reading or working math problems. His book bag sits next to the desk, and he retrieves what he needs from it. Like Molly everything is within arm's reach and easily accessible. He studies in a space where no one can come back and disturb him.

When I visited Bennett's house, I was not taken to his room, his Most Restrictive Environment, where he claims to do most of his studying. "I can't study down there now

because there isn't enough light," he told me the evening I visited. Unlike Miles and Molly, however, Bennett can study with family activity around him, but not right before a test or a major project. "Normally on those days I have to get away from everyone," he said. "I go to my room, listen to my country music, and read. Sometimes I'll hear my family upstairs, but it doesn't bother me." On other days he will study in the kitchen with the family interacting around him, and on days before a big test or paper he will listen to his iPod of country music if it is evening and there is not enough light for him to study by. But his preference is his room before a pivotal assessment the next day, as his journal entries indicate.

The breakfast area is the hub of activity in his house. Family members are constantly moving back and forth as Bennett studies. He keeps his back to the kitchen, however, and studies with an intense look of concentration and determination that I have also seen from him on the basketball court. "Normally I listen to my iPod when I study in here," he told me, "but I've misplaced it right now." Nonetheless he forced himself to concentrate as his grandmother, brother and mother moved about the kitchen talking, and the family pet was whining and scratching the door from the other side. It was clear Bennett had no control over his environment in this room, but he told me that he did not have a lot of studying to do that night, "just six or so math problems." He worked undeterred until he finished, closing up his book and joining the conversation I was having with his mother while he texted back and forth to his girlfriend.

Jeff likes to stand every time he studies. "Sitting means relaxing," he told me. "So I stand when I study and read." His study area at the bar is behind the kitchen and next to the television room, so there is quite a bit of traffic through there each evening. Since he cannot

study in his room because, like Miles, there are too many distractions that lure him away, he will get up at two or three in the morning on days before a big test or paper to maximize his concentration. That is, he controls his study environment prior to a major test by occupying that part of the house in the early morning hours when everyone else is asleep. "It's perfect because no one's up," he said. "Nothing then can tear me away from what I have to do." And while standing, he will read either from print or electronic text in the quiet of the bar room before his family gets up.

Unlike Miles and Molly, Jeff's study environment stands in complete contrast because of all the decorations and clutter that make up the space. A dentist's chair, a mannequin, bar glasses, books, papers, clothes, empty drink bottles, mirrors that enable you to see into the kitchen, and an open area to the left with a table and laptop computer all comprise Jeff's favorite study area. I observed him as he studied, working on two secret codes for his AP World History class, while his dad and twin brother made dinner and watched television, his younger brother worked on the computer in the same room, and his dad came in from time to time to scold his younger brother for not staying on task. "Normally I have on my laptop to YouTube and listen to study music," he said. "But I don't have too much to do tonight, and I want to talk to you." Jeff does not need to study as hard tonight, so he does not need to control his environment as much. As he told me in the interviews and in his journal, he will gain this control the day before a major test at two or three in the morning when the rest of the family is asleep.

Without question all four of the students stressed the need to be in this Most Restrictive Environment prior to a big test. They cannot concentrate if there is any traffic in their study area. Any distractions tear them away from their concentration, and they feel they will not do

as well on the next day's test. However, they do differ in how often they need to be in the Most Restrictive Environment.

Different Needs for the Most Restrictive Environment

Bennett and Jeff do not need to study in a Most Restrictive Environment if they are not studying for a test the next day or working on a project that is worth a bigger part of their grade. Miles and Molly, on the other hand, must do so absolutely regardless of the reason for studying.

This observation becomes apparent on my field visits. Miles and Molly did not allow me to observe them study in earnest because my presence was too much of a distraction; rather, they sat at their desks, talked, and demonstrated their respective routines. "I'll put my notebooks here and check my schedule," Molly told me from behind the dining-room table that serves as her desk. She takes out a piece of paper and confers from it. "It says here that I need to read some parts of *The Odyssey*. So I'll put the paper back in and get out my literature book and start reading *The Odyssey*." As she talked, she did precisely that, even pulling out her literature book and turning to the page from which she needs to read. "I do this every night, whether I have a test or a paper or not. If I have to read from my computer, I'll bring it out in front of me and read like this." She talked me through her whole routine and demonstrated it all for me, careful that I would not miss any part of her successful regiment.

Miles did the same thing. "My book bag is always next to me on the floor," he said, pointing to it next to the desk. "Before I leave school I make sure I have what I need to study. Then I pull it out and get to work." Miles does not spread out like Molly. He does not need a dining-room table as the small desk serves his purposes well. He merely retrieves what he needs and puts

the rest of it back in his book bag. He only places the subject he is studying for in front of him, and he has a laptop to his left that he can access if he needs to. Unlike Molly, this is the only room in which he can study. Molly will review her notes or the reading in her room with the television or radio on, but she stresses that it is only a review after studying in the Most Restrictive Environment the night before. Miles, on the other hand, can only study in his room. He notes in his journal that when he reviews his notes, he is in his room.

Bennett and Jeff do not need the Most Restrictive Environment every night. They profess its need before a major test; other nights they can study in a less restrictive environment. When I visited their homes, they actually studied while I observed and we talked.

Bennett sat with his back to the kitchen in the Breakfast Room. After his dinner he shoved his plates to one side and retrieved his math book from his book bag on the floor next to him. "I have some math problems to do tonight, so I don't have a whole lot to show you," he said by way of apology. And while in the midst of his grandmother clearing the table and washing the dishes, he began to work on his math problems. He continued when his mother came home and spoke to him and when his little brother came in and met me. I asked him if he always studied in here. "I prefer my room," he admitted. "But if there's not enough light, I'll study up here. Before a major test, I'll usually have my iPod on." He smiled. "Only I can't find it right now."

Jeff is surrounded by a similar maelstrom on certain nights. Like Bennett, he had no problem with me watching him study. He also worked through the noise of his family, a lot if coming from the same room. I asked him if he could concentrate through all this after his dad had come into the room to make his younger brother work on his homework. "Normally I have

my study music playing from YouTube,” he said. “That helps with some of the distractions. But if it’s a big study night then I have to come in here at two in the morning when nobody else is here.” Like Miles, he cannot study in his room. “It’s too distracting,” he said. “I get busy doing other things, and I won’t study. So I gotta study in here.”

While the Most Restrictive Study Environment is necessary for all four students the night before a big test, they differ in how much restriction they need on other nights. Miles and Molly can have no one around them, but Bennett and Jeff have more flexibility in this regard. This distinction may be a byproduct of the home environment in which they grew up.

Home Environment

The two students who require the Most Restrictive Study Environment at all times, Molly and Miles, live in large, affluent upper middle class homes that are roomy and spacious. Family members are easily cloistered from one another to work or play. “I comprehend better when I’m here by myself,” Miles told me from the sanctity of his study room. “I’ve noticed a definite difference; I’m glad my parents let me use it.” Molly is the same way. “I can’t have people around me; they bother me if I’m studying,” she said from her study room which, incidentally, is in a part of the house she has to herself. “No one can come in here when I’m studying. I just can’t do it.”

The two students who can handle more distractions in their study environment, Bennett and Jeff, live in smaller middle class homes with fewer rooms and space to move about. In the study spaces they showed me, it is impossible to avoid contact with other family members due, in part, to the proximity of both study areas to the kitchen. However, they are able to tune out this activity and focus on the reading material before them in an environment that would be

impossible for Molly and Miles, who need a Most Restrictive Study Environment at all times. “I prefer my room before a test, but I can handle it in here other nights,” Bennett told me from the Breakfast Room next to the kitchen. “As long as I have my iPod, it’s good.” Jeff felt the same way. “If I don’t want any distractions, I’ll come in here around two or three in the morning,” he said. “But I like studying in here if I don’t have a big assignment. I just listen to my music and won’t let the other stuff distract me.”

All four students have adapted to the environment in which they grew up, but all four need to be alone and in total control of their environment immediately prior to a test or paper in order to learn the most from their studies. When I visited their homes, I found the overall activity level around the house to be commensurate with the activity level around their study sessions.

Problem Solving versus Reading

Three of the students indicated in their discussions and journals that they have more flexibility when studying math or doing math related work. “When I babysit, I’ll usually do my math homework,” Molly told me. She is the only student who babysits. “I can’t read in someone else’s house if I’m studying, but I can work on my math. But the children have to be asleep and I have to have it absolutely quiet.”

Bennett and Jeff have similar flexible study habits when it comes to math. In fact, they were working on math related problems when I observed them studying (Jeff’s secret codes for the Ottoman Empire involved a lot of math, and he frequently worked from his calculator to develop the code). “If I’m just reading,” Jeff said, “I have to have music to help me focus. Right before a test I have to have the music and be by myself. But I can pretty much do my math

homework anytime, anywhere.” Bennett feels the same way. None of them offered any theories on why this was so. Only Miles needed his Most Restrictive Environment to study math.

The Artificial Environment

The second theme is that each student must control the surrounding environment the day before a test or major project. In addition to completely isolating themselves from other people, they also need to limit or eliminate the outside stimulus that competes for attention. As Mary Ann Wolf (2007) postulates in her book *The Proust and the Squid*, the brain is not predisposed to this kind of exclusory concentration. To do so eschews a person’s basic survival instincts and leaves him vulnerable to unsavory environmental elements. So, in order to counter the brain’s survival instincts, these students trick their brains into believing they are engulfed in a special environment and are therefore, in a manner of speaking, reassuring their brains that they are very much aware of the surroundings. In effect, they are creating an Artificial Environment.

For Molly this artificial environment is total silence. “I just get easily distracted,” she told me from the seclusion of her study area. “These walls are thin and sound carries. I can handle just a little bit of noise. But if it gets to be too much, I have to stop studying.” In her journal she records that she was able to work through such distractions as her dad fixing an alarm clock and some movement downstairs. But she also records on some nights when no one else was home and it was completely silent. “I don’t know why I’m that way,” she said, almost apologizing. “Music bothers me, TV bothers me, my mom cooking in the kitchen bothers me. The quieter it is for me, the more I can concentrate.”

Molly's need for total silence is different from the other three. Miles, Bennett and Jeff prefer to study with music. In Miles' study room, the muffled sounds of the family's movements including noise from the television leaks through the French doors. Miles listens to music to counter the stimulating distractions these noises make for him. "Music helps me focus," he said from his desk facing the corner of the room. "That way I won't hear my parents and what they're doing. I get a lot more done and learn more."

For Bennett and Jeff, the music serves not only to block out the extraneous noises of the household, but to keep their focus when other families are moving around their study areas. "I can handle a little bit of my noise from my family," said Bennett from the breakfast room table as his grandmother washed the dishes. "But on a test night I'll be in my room with the music on. If I study in here, I always have on my iPod...when I can find it," he added with a smile. Bennett does note in his journal that he could study with some family distractions such as the television playing "upstairs" and his family moving about the house, but he also notes that on most nights he listens to country music.

Like Miles, Jeff listens to music all the time. In the bar room where he studies, other family members are also studying, sometimes quietly and sometimes not, or helping each other study around the small table in the expanse of space to Jeff's left. The proximity of the bar to the kitchen and television room compounds the extraneous noises he will hear, so he listens to music all the time. "I won't have to check out the distractions if I'm listening to music," he said. "It [the music] helps me stay on task."

Rather than work against the brain's predilection to be in constant awareness of its surroundings, these four students work with it. By creating an environment of total silence or

music, they create an Artificial Environment that minimizes the outside stimulation and enables the brain to further its focus on the material being studied. Again, if there is a test or major project due the next day, absolute quiet or total music is necessary for all four of them. If the stakes are not so high, Bennett and Jeff can study with some family distractions around them, but Molly and Miles need a consistent environment to study in no matter the stakes.

Reading for Pleasure

All four students admit that they do not need a Most Restrictive Environment or Artificial Environment to read for pleasure. That is, they can read for pleasure in any room of the house surrounded by family noise and movement.

“I’m more motivated to read for fun,” said Molly. “So I can read in my bed with the radio and TV, or I can read downstairs in the kitchen with the rest of my family in there. It’s only when I study that I have to have it quiet with no one around me.”

Miles is the same way. “The more motivated I am to read, the more distractions I can handle. So I can read [for fun] in my room or the TV room.”

Jeff also has greater flexibility when he reads for fun. “I can read anywhere for fun. It doesn’t bother me to read in the kitchen when my family’s in there doing stuff or the TV room or the poolroom. If I’m really interested in something, I can block everything out. I’ve always been that way.”

Bennett smiles sheepishly when asked if his pleasure reading habits were different. “I don’t read a whole lot for fun because, well, because reading is not fun for me. It’s not something I do a whole lot of in my spare time. But when I do read for fun, I don’t need my iPod to concentrate and I can read anywhere in the house.”

Only Molly and Jeff noted when they read for pleasure during the two-week journaling period. Jeff writes that while reading he “had to be quiet and relaxed.” Molly notes that she read for pleasure in her bedroom with the television on.

Music to Motivate

Miles is the only one who says that the music he listens to while he studies motivates him to study. “I like listening to instrumental stuff,” he told me with a smile, relaxing momentarily his stoic façade. “I even listen to it in my car. So I look forward to studying so I can listen to the music. Not only does it help me concentrate, it’s fun to listen to.”

However, Miles is the only one who feels this way. Bennett likes country music and rap, but the opportunity to listen to it does not motivate him to study. “I listen to the music to block out the other sounds around the house. Country and rap are my favorites, so that’s what I’ll listen to.”

Jeff is just the opposite of Miles even though they like the same kind of music to study by. “What I like about YouTube,” he explains to me from his study bar, “is that they’ve got hundreds of different sites that have music to study by.” And he showed me the sites on his computer, paging down a vast number of ones that feature instrumental music. “If I get too familiar with the song, that distracts me. So I have to find a bunch of new tunes to listen to. I can’t listen to the same ones over and over again.”

Jeff is the only participant who had to have this kind of variety in his artificial environment. Neither Miles nor Bennett expressed any qualms about listening to the same songs over and over again. As long as they had a certain kind of music, they felt like they could maximize their learning power by listening to it.

A Retro Environment

The third theme is that each student must entirely limit or sharply curtail the amount of dynamic interaction they have with technology by creating a Retro Environment. Each student has found he must also read only one thing at a time, uninterrupted and undistracted, in order to concentrate and do well on an exam or paper. That is, in the Most Restrictive Study Environment, they will avail themselves to no other text sources the day before a major exam or paper. And if they are studying from the computer, they cannot surf the internet or handle pop up messages or ads. They are creating a Retro Environment, retrogressing to the days before computers when one's reading material did not distract with pop up ads, messages or videos.

"The truth is, I can't stand to study from the computer," Molly told me from her study room. She dragged her laptop from the corner of her desk to the middle where he sat right in front of her. "For one thing I've got bad eyes and the screen gets fuzzy on me and all. But mainly I can't concentrate as well and I don't feel like I'm learning as much."

Molly prefers to hold a piece of paper in her hand so that she can physically underline important passages or make notes on the margins. She did not feel she could do this with a computer. Shaking her adamantly, she reiterated that she could not stand to read from the computer. "No matter what, ads are always popping up. It's just harder for me to do." In spite of these difficulties, she usually will not print off what she is supposed to study. "I don't want to waste the paper, so I will try to study from the computer when I have to."

Miles was equally vociferous when he talked about studying from the computer. "I'll do it only when I have to," he said, nodding to the laptop that sits off to his left on his desk. "I like

books. I mean, I don't know why, but with a book I can focus on the words better. With a computer, I can't. It's like I'm trying to focus on the whole screen or something and not the words I'm reading." He will even turn the computer off the day before a major test or project is due. "If it's not as important, I'll leave my computer on."

Miles also affirms that he comprehends better from reading a book. "I used to check my Facebook out a lot, but now I just listen to music." He paused, and then added with a shake of the head, "Computers just distract me more. I can't concentrate as much." For Miles the computer poses the same threat to his ability to comprehend as studying in his room with a wide screen television and stereo system: both in his estimation contained land bombs that with one misstep will cause him to lose his focus and potential to learn the material.

Bennett prefers books to computers. "I feel like I'm learning more," he stated. He also says he likes to be more mobile when he reads. "I can read from my couch or my bed or someplace like that. I can't do that with a computer." Prior to a major test or project, Bennett will dissociate himself from electronic devices. "I turn my cell phone off and won't surf the net or anything like that," he states emphatically. "I have to focus on one thing only or I'll never learn it. That stuff can just be too distracting."

Jeff is the only student who prefers to read from a computer rather than a book, but he states that this distinction is subtle and that he is usually indifferent to the source of his reading material. He finally concludes, "I just like reading from computer because you can check out facts you don't know. You have access to more information, and I learn more from the computer."

Nonetheless he, too, concedes that he cannot have any distractions the day before a test or major project is due. "I have to stay focused, so I can't really surf the net or check my Facebook or anything. I like to use the computer, so I don't like to be completely cut off. I'll check my email every fifteen minutes or so, but I've gotta stay more focused right before a test. So I try not to surf or check my email as much."

The day before a major test or project is due, each student limits the amount of dynamic interaction with electronic text and creates a Retro Environment. The ability to focus on a single subject, the material they are currently studying, is paramount to their success. Jeff is the only one of the four who will allow some distractions while he studies, but he will limit those severely prior to a high stakes assignment.

Touch

Studies by Mangen (2008) and Everding (2009) purport that the ability to touch the pages of a book better enables comprehension and learning while reading digital text places the reader at a distance making it harder to comprehend the material. Three of the students admit that touching the pages of a book helps them concentrate. Jeff is the only student who does not feel touch better engages him in his studies. "It just makes more sense to me to study from a computer," he tells me from his study area. He pulls out his computer to demonstrate. "You see, if I'm reading something and I don't understand it, I can access all these sites to help me. It just makes more sense to me to study from a computer. When I read from a book, I have to rely on what I already know. And if I don't know something, I have to read on or get up and look it up. I just like to study from a computer because, like I said, it makes more sense."

But Jeff is the anomaly. The other three not only prefer books because it eliminates the distracting dynamics of a computer, but they like the touch and feel of a book. “I need something tangible in my hands so I don’t get distracted,” Molly said from behind her study desk. “Holding the book helps me stay focused. I can concentrate better.” Miles states he notices a difference in his comprehension; it is better from a book. “I like holding it in my hands,” he says and shrugs. “I don’t know why I feel that way, but I do.” Bennett also feels the same way. “I like being able to turn the pages and holding it in my hands,” he says from behind the kitchen table. His brow furrows in concentration as he seeks to articulate why. “I guess it helps me read better and concentrate more. I just like it more.”

Reading History

All four students were taught to read by their parents, and all four students learned to read from a book even though they grew up with computers. Their parents would dedicate a reading time devoid of all other activity specifically to read to their children, encouraging them to read back and test them for comprehension. In fact two students, Molly and Jeff, have mothers who are reading teachers.

“My mom used to take us into her bedroom and we’d [her older brother] sit on her bed while she read to us,” Molly says from her study room while gazing at the pictures of her and her brother on the stands. “And she would always question us. Like did we understand the plot, the rising action, characters, and all that stuff. We sort of understood stories better than other kids do when we started school. Our mom made sure we know about ‘em.” Their reading time was exclusive; that is, there was no television or radio on while they read, and the conversation revolved around the stories they read.

Jeff had a similar experience. “Since my mom was a reading teacher, she’d bring a bunch of books home from school and tell me what they were about. We would sit down together and I would pick out the words I didn’t understand and she’d tell me what they meant. Eventually I’d start to read by myself and more slowly so that I could understand what I was reading better.”

Bennett’s mom read to him when he was little. “I’d get home from work and make sure we’d have reading time together,” she said, her eyes glistening as she remembered something pleasant from her son’s early childhood. She looked at Bennett while he intently worked on his math problems from the breakfast table. “He was quick, precocious. After we’d read together, he always wanted to figure out the words himself. So he’d just read, no other distractions, determined to learn. That’s the way he’s been his whole life.”

Miles’ parents had similar experiences. “We would read to him, but he’s always been self-motivated. We never had to prod him to do anything, so he would read by himself to figure out the words and ask us when he needed to.” While they talked over dinner, Miles quietly ate showing no signs of embarrassment or discomfort at being the focus of attention. “He’s pretty much been that way his whole life.”

In short, there are no discernible differences in how the participants learned to read. They were all taught to read from books, and they all had a dedicated reading time with their parents with no other distractions around them as they engaged in the reading.

Assessment Results

The students have different degrees of success with their teacher assessments. The most noticeable dichotomy exists between Miles and Jeff. Noticeable because they took the

same assessment from the same teacher and had very different results. Miles made a 96 on an AP World History, 18 points above the class average. Jeff made a 78.5 on the same test, .5 above the class average. In both cases they passed. Molly did very well on two literature tests, scoring five points above the class average on a difficult standardized test for *The Odyssey* and nine points above average on an essay test also for *The Odyssey*. Bennett had similar success on a *Hamlet* quiz, scoring an 80.

In analyzing the standardized tests the students have taken in earlier grades, Miles' overall reading comprehension scores were the highest. The second highest was Molly, and she was followed by Bennett and Jeff who scored about the same.

FINDINGS CONCLUSION

In sum, these findings indicate that the participants follow Three Common Cores of Control when studying for a test or working on a project due the next day:

1. The Most Restrictive Environment. The students will place themselves in a room or at a time when no other family members can disturb them. The absence of people in the same room is important to them;
2. An Artificial Environment. Once secluded, the students then proceed to create an artificial environment to trick the brain into believing it was totally aware of its surroundings. Three of the students achieve this by listening to music, and one student (Molly) achieves this with absolute silence;
3. A Retro Environment. In order to focus solely on what the students needed to study, they would eliminate any dynamic interactions with technology. They would either

turn off their cell phones and laptops, or sharply curtail the amount of time they spend on them.

Different degrees do exist within these common control cores, but they all practice the same study discipline the day before a major test or project.

CHAPTER V

DISCUSSION

This case study examines the relationship of deep reading to the study habits of four gifted students. First the study probes into how each student studies; then the study delves into the extent technology is used during these study sessions; finally, the study takes a close look at whether or not deep reading is part of the students' study practices. This chapter is divided into three parts. The first part summarizes the results of the study based on the first three research questions. The second section relates the interpretation of the results and the findings. The final section deals with the implications of the study, the limits of the study, recommendations for future research, and the conclusion.

Discussion of the Research Questions

The First Research Question

The first research question, What self-regulated strategies do students employ while reading a text for comprehension?, is addressed during student interviews, home visits and journals. All four participants need a place of isolation, a Most Restrictive Study Environment, the day before a major test or project. Place, however, is not enough. They also need to control the surroundings by creating an Artificial Environment of either music or silence to help them focus. And, finally, they have to control their interactions with technology by eliminating or minimizing distractions down to a Retro Environment for maximum concentration.

Studies of the brain point to the need to limit outside stimuli to better learn material. Hallowell (2005) found that multiple sensory stimulation causes people to have difficulty staying organized, setting priorities, and managing time. Short Term Memory or Working Memory is the first place information enters the brain before being filtered into Long Term Memory, and Working Memory can only take in so much data at one time before it becomes distracted and confused (Klingberg, 2009; Baddeley, 2003). Through the Most Restrictive Study Environment, the Artificial Environment and the Retro Environment, the four participants eliminate as much outside stimulation as possible to better comprehend their studies. And furthermore, the day before a test, they have to eliminate almost all distractions.

Engaging the Most Restrictive Study Environment, the Artificial Environment, and the Retro Environment facilitates deep reading. Wolf and Barzillai (2009) described deep reading as an array of sophisticated processes that propel comprehension. In fact, to concentrate on a single, sustained subject such as a book is not natural to the brain because, as part of our evolutionary survival skills, the brain needs to be aware of the environment as much as possible; therefore, in order for learning and synthesis to take place, the discipline to block out the outside environment compels the learning process (Wolf 2007). In this study the four participants set this very stage for deep reading through the Most Restrictive Environment (isolation), the Artificial Environment (music or silence), and the Retro Environment (limited interaction with technology). Three of these Digital Natives do not like to study with a computer because the computer itself becomes a distraction. And the one student who prefers to study with a computer still needs to minimize distractions and interactions so that he can focus on the subject he needs to study. In other words, the participants choose to interact only with the

material they need to study the day before a test or project is due; all other interactions, they feel, are detrimental to their ability to learn and synthesize the material. They set the stage for deep reading.

The Second Research Question

The second research question, What epistemological beliefs influence students' choice and use of heuristic strategies when engaging with printed text?, is explored using the interviews and field visits to the to the participants' homes. Liu (2005) found that screen-based reading behavior is monopolized by browsing and scanning, keyword spotting, one-time reading, non-linear reading, and less selective reading rather than time spent on in-depth reading and reflection. Miall and Dobson (2001) asserted that hypertext reading discourages absorbed and reflective reading. Tyrkko (2007) stated that reading hypertext promotes an altered view of coherence because it forces the brain away from the staple of linear text and learning; furthermore hypertext reading demands more of Working Memory attention.

Three of the participants emphatically stated that they prefer to study from a book and do not like to study from a computer. They told me they could not comprehend the material as well, were distracted by involuntary messages popping up, or were tempted to use the computer for something other than studying. In all cases the participants tell me they could not give the material the proper focus. The one student who prefers to study by computer admits that he gets distracted and off-track when he reads from the computer. But he is equally adamant when he says that the day before a test or project he sharply curtails his habit of Internet surfing or checking out social media sites. One method he employs is getting up

around 2:00 a.m. when not only is his household asleep, but so are his classmates with whom he would likely interact on social media sites.

Again all the participants eliminate distracting elements to focus on the subject they are studying. The myriad of distractions disrupts their ability to concentrate on the material they are trying to learn, so they exercise greater control by reading from a book or limiting dynamic interactions in a Retro Environment. In her theory of deep reading, Wolf (2007) stated that the brain must exclusively engage with the reading material in order to comprehend and synthesize the material. This practice enables deep reading and deep processing to take place.

The Third Research Question

The third question, How are self-regulated learning strategies and epistemological beliefs related to student performance on reading comprehension tests?, can be divined from the participants' assessment results. All four participants are identified as gifted, and they all do well on teacher assessments. They are pleased with these results, and they foster study habits to maintain these results.

The participants derive their epistemological beliefs from years of feedback they had received from their teachers' assessments and standardized tests. These participants want to do well in school because they believe success in school will equal the success they will have with their chosen careers. They have therefore developed certain study patterns, habits and environments that enable them to do their very best on school tests or projects. Bandura (2001) found that students arbitrate their own study methods to cultivate maximum learning and academic success. Indeed these participants establish their own, private study area and conditions free from all distractions before a high stakes assignment involving scholastic

reading and comprehension. According to their parents, they are independent students who need little to no prodding to excel in school. Through this evolution of epistemological beliefs, the four participants continue to nurture personal methods that enable them to be most successful.

Bandura (1991) related that people possess self-reflective and self-reactive capabilities that give them some control over their motivations. The participants tell me their study rigor grew more intense once they entered high school. Since they are motivated to do well, they have discovered that in order to meet the ongoing and increasing challenges of high school, they had to secure the place and conditions that would meet their needs. Bandura (1982) found that when students' self-efficacy increases, their interest and preparation increases for future challenges. According to the participants, these rituals are paramount for optimal success, piquing their desire to do better and meeting the future challenges of their classes. All their practices foster the state of deep reading.

Interpretation of the Results and Findings

Three Common Cores of Control

When I first started this study, I was interested in examining the theories of deep reading and whether gifted students, who were born after computers had become commonplace, employ deep reading strategies to be successful. The three themes which emerged from the data were: the students isolate themselves in a Most Restrictive Study Environment prior to a big test or project; they create an Artificial Environment induced by music or silence to better focus their concentration; and they engineer a Retro Environment by disabling or minimizing all their electronic devices' interactions and interruptions. I termed

these three themes the *Common Cores of Control* because these participants are gaining greater and greater control of their environment immediately prior to a test or a big project.

When Nicholas Carr (2010) was writing a book relating to the Internet's effect on the brain, he had to discontinue his cell phone service, his cable service, and his internet service so that he could finish the manuscript. Similarly, Small (2011), a neuroscientist at UCLA, had to disconnect himself from technology to better concentrate on writing his book. They were, in effect, commanding complete control of their environment in order to give their projects the concentration they needed to give to be successful. This is precisely how the four participants achieve and maintain their academic success; they wrest complete control of their environment by closing themselves off from outside distractions to create an alternate environment, one that better enables each to concentrate and learn the material at hand. The greater the need to learn the material, the more control they gain over their environment. All three Common Cores of Control interplay with the participants' self-regulated study habits.

Study habits and attitude play an instrumental role in a student's academic success. Assessment results among students who test above average, average, or below average emanate from their discipline, their attitude, their interests, and their ownership of self-regulated learning habits. Students who take ownership of their learning are the ones who have the most successful academic life (Acido, 2010).

That is certainly true of the four participants selected for this research study. The central debate for this study, however, is not whether the participants study and take an interest in their studies, but rather what the participants are doing and thinking while they study. Specifically, are they able to multitask and ignore distractions while they concentrate, or must

they dissociate themselves from any or all distractions for optimal learning? It is important to know how these successful participants self-governed their study habits in this age of computers and whether deep reading is a part of this success strategy. The findings from this study point to a probable connection between the participants' study habits and deep reading.

Deep Reading in the Most Restrictive Environment

The first outside stimulation the participants avoid is other people. They each have found in their homes a place where they can study and where no other members of the household will disturb them. Two of the participants have exclusive use of this site and allow no one around them while they study at all times. One student prefers to use his room most of the time, will use it the day before a test, but will be forced into a more populated area if there is not enough light on other days. The fourth student gets up in the early morning hours when the rest of the household is asleep. The findings indicate that the brain is elastic and can adapt to its environment (Gee, 2000, 2003; Gee & Levine, 2009; Tapscott, 2010; Moje, 2002), but there are limits to the brain's adaptability (Klingberg, 2006, 2009; Wolf, 2007) since the four participants actively employ all Three Common Cores of Control to deep read the day before a test. Ultimately all four participants state that the presence of other people is distracting to them; Working Memory becomes overstimulated, or there is too much competing for attention in the Working Memory that takes them away from the single focus of their studies. They all relate their most intense and best study sessions come when in isolation.

Home Environment. Two participants who relate that they must study in isolation at all times have grown up in affluent, large, upper middle class homes with enough space to give them an exclusive study area. The other two participants who state they do not have to study in

isolation all the time have grown up in smaller, middle class homes where it is not possible to have an exclusive study area, but they will find a place or a time of isolation the day before a test or project is due. This gives more credence to the idea that the brain is adaptable, elastic and organic enough to adjust to its surroundings (Gee, 2000, 2003, 2009; Tapscott, 2010; Moje, 2002). But since each student must be isolated the day before a major test or project is due, it also gives credence to the idea that some form of deep reading is taking place since isolation is necessary to minimize distractions for these participants.

Problem Solving Versus Reading. Three of the participants claim they can work on their math problems in any environment. When one participant babysits, she will only work on her math problems because she is away from her Most Restrictive Study Environment, and the two participants who allowed me to watch them study were working on their math homework. This is not to suggest that deep reading skills are not needed to learn math. Indeed, deep reading is prevalent when students are learning new math concepts. Schoenfeld (1984, 2008) discovered that a student needs twenty-two minutes to work through a math concept they are unfamiliar with; the more familiar the student becomes with the concept, the less time that student will need to solve the problem. Immediately prior to a test, however, the participants stressed the need for a Most Restrictive Study Environment to memorize equations and practice working them effectively. The need for the three Common Cores of Control in math depends on the students' familiarity with the concepts they are learning and if they are being tested on the concepts the next day.

Deep Reading in an Artificial Environment

Distraction is a relative concept. What may distract one student may not bother another student. This is certainly true of the four participants in this study. However, what also becomes evident is that the day before a major test or project is due, all the participants are more easily distracted. In order to counter this, they further maximize control of stimulation outside their study environment. Wolf (2007) maintains that an undistracted environment is not natural for the brain and that a human must overhaul thousands of years of jungle survival skills in order to accomplish this task. By surrounding themselves with a certain kind of music or absolute silence, these participants create the illusion of an environment. Rather than work against the brain's natural instincts of survival, they are working with the brain within an Artificial Environment.

In summary, these participants are limiting the amount of information competing for attention in their Working Memory so they can admit more relevant information into their Long Term Memory that facilitates better learning and synthesis (Wolf, 2007; Klingberg, 2006, 2009; Roberts and Roberts, 2008). Wolf (2007) noted that the undistracted brain forges the requisite neural connections enabling synthesis and learning to take place. The Common Cores of Control enable the brain to enter into a state of deep reading, deep processing, learning and synthesis. The Artificial Environment sharpens the brain's focus onto the subject being studied.

Motivation. All participants related that they can read for pleasure in any environment and do not need to engage the Three Common Cores of Control since they are more motivated to read the material. Deci and Ryan (2007) defined three types of motivation in their Self Determined Theory (SDT): introjection, which involves total ownership free from outside

pressure or demands; identification, which involves valuing the behavior and accepting it as your own; and internalization, which means accepting the behavior as a part of you with no outside restraints. The participants want to read this material, no one is making them, they value what they are reading, they have an interest in what they are reading, they believe they are in greater control of their actions and desires, and they are therefore less aware of the environment around them. As they pleasure read, introjection, identification and internalization compel them into a state of deep reading sans the Three Common Cores of Control. Another equally important possibility is that deep reading is not needed since they will not be assessed on this material.

Music as Motivation. One student is motivated to study because it gives him the chance to listen to music that he likes. His motivation can be attributed to a sense of control and ownership that he needs, incorporating something that he values and is a part of him, while he studies for a subject in which he is not interested. Introjection, identification and internalization are all a part of his motivation to listen to this type of music. He finds the music itself a substitute motivator for studying a subject that he does not find interesting.

Deep Reading in a Retro Environment

Once the participants are isolated and surrounded in a special, controlled environment, they need to control their interaction with technology. They either eliminate or limit the amount of interplay they have with a computer or other electronic device. This final measure of control enables the participants to give their undivided attention to the material on which they will be tested. Three of the participants emphatically related they simply cannot handle the interruptions of pop up ads, messages, or the lure of surfing the internet as they study on the

computer. Again there is too much stimulation competing for the attention of Working Memory. The participants state they do not learn as much, a result of the wrong information filtered into Long Term Memory. And the one student who prefers to study on the computer admits that the day before a test or project, he cannot access the internet, his social media sites, or handle pop up distractions. In other words he prefers the computer but not the distractions that accompany it.

Tactile Emersion. Three participants like to study while they are physically touching a book or a piece of paper. Mangen (2008) and Everding (2008) found that a tactile experience with a book, the touching of the pages and the feel of the cover on the hand, helps immerse readers into a deep state of reading. In their studies on hypertext and literature, Miall and Dobson (2001) and Liu (2005) found that hypertext discourages the absorbed and reflective modes that characterize reading and less time is spent on in-depth and concentrated reading. Three of the participants have concluded that book is the premier source of synthesis and learning through engagement with touch, and that reading from a printed page is preferable over a digital page. Touch helps these participants eliminate additional stimuli and focus on the material to be learned.

Another reason the participants prefer to study from a book is that computers have too many distractions for them. The participants do not like the randomness of the instant messages and ads that pop up, and they are tempted to surf the web or engage with their friends on social media sites. In short, their Working Memories are distracted; they are not learning the material they need to study; and deep reading is not taking place.

This is not to say that deep reading can only be accomplished with the use of a book. One participant prefers to study with the use of a computer because he can research information he does not understand. If he finds himself straying from what he needs to study, he uses that as a signal that he needs to take a break and will move physically away from his study area. Therefore it is possible that he is deep reading on the computer, and he does not need the touch of a book or piece of paper to induce this stage. The key is to eliminate the outside distractions that would preoccupy his Working Memory.

Reading History. Even though these participants grew up with computers in their homes, they were taught to read from books in an undistracted environment. The importance of this genesis cannot be overlooked. Daal and Reitsma (2002) studied a group of kindergarten participants learning to read. One group was taught to read and spell with a specially designed computer program, and another group was taught to read in a conventional classroom setting. The participants using the computer learned to read and spell in 16 hours while the students using conventional means took three months to learn the same material. And in another study by Reinking and Rickman (1990), a group of students read difficult passages from a computer while another read from printed text. The group reading from the computer outscored the group reading from text in both comprehension and vocabulary retention. Clearly deep reading, synthesis and learning are taking place for those who read digital text, so computers in and of themselves do not limit a person's ability to learn. To put it another way, entering into a state of deep reading by touching the book or pages may be a learned behavior. Deep reading skills still implant themselves when engaging digital text. The one participant who prefers to read from a computer practices deep reading skills by enlisting the Three Common Cores of Control.

The history suggests that these participants may be more comfortable studying from books because they were taught to read from them, and it would take acquiring some new skills to learn to read from a computer.

Assessment Results. This study looked at the participants motivation and self-regulated study habits. All participants are successful in school. Indeed testing has been the final measure of their academic success. Through the years they have perfected the Three Common Cores of Control into successful study habits, and the results are plainly evident. That is, they engage in deep reading by studying in a Most Restrictive Study Environment, an Artificial Environment, and a Retro Environment. According to the participants, these habits help them stay successful, and they see no need to change in the foreseeable future. They are motivated to maintain their current habits, their grades and their discipline to stay on course.

Implications of the Study

Is deep reading integral to successful study habits? All participants eliminate outside distractions; all focus their exclusive attention to the material the day before a test; all need to give their undivided attention to one subject the day before a test or project is due. Deep reading has become an integral part of these participants' success.

This study shows that the state of deep reading is not limited to conventional print media. It is the utilization of all Three Common Cores of Control that enables the participants to enter a state of deep reading, not the source of the media. This formula has been successfully employed by these four participants who have been identified as gifted by their school systems and enabled them to have continued success in the most challenging classes. The brain

presently cannot accommodate a multitude of distractions while maximizing its learning potential. The key is to eliminate the distractions (see Appendix E).

The Importance of Brain Studies

We are only beginning to understand how the brain operates in the context of current technology. In 1999 an organization called Learning and the Brain originated. Its purpose is to unite educators and neuroscientists on cutting-edge research involving the brain and technology. The hope is to help educators improve their practice based on research being conducted at Harvard, Yale, MIT, Stanford, Berkeley, UC Berkeley, the University of Chicago, and John Hopkins University. Each year Learning and Brain hosts symposiums, conferences and special classes to assist educators in improving their practices. The ability to help the learning disabled or the physically impaired may grow with these studies, and much more research is being encouraged among educators and neuroscientists in this burgeoning, new field. After all, as educators we are on the front line with our students in large classes; today we teach to greater and greater variances in knowledge and learning styles to students who are housed in the same classroom at the same time. As these challenges become greater for educators, the need for additional research is also needed. Better understanding of the brain may help people better realize everyone's potential, and educators should be at the forefront of this great awakening.

And deep reading is at the core of successful learning. These four participants are gifted readers, high achievers, intrinsically motivated to excel at school and take control of their study habits have successfully used deep reading strategies; therefore, we need to encourage more studies in this field to understand how to help all students including the learning disabled be as

successful as possible. After all, technology is not going away. We need to understand how to best use it as technology continues to grow and advance.

Limitations of the Study

Kosik (2011) cautioned that, due to the glut of information to which we have access to because of the advances in technology, much of so-called empirical data is too anecdotal and confusing even to the experts. In qualitative case studies, a small unit is examined at first to begin to understand the whole. A case study notes both the particular and the general, and the differences are indicated by degrees or depth of study; that is, case studies partake of both these worlds to understand matters in degrees and not dichotomies. A particular case study will focus on particular situation, event, program or description (Stake, 1995; Merriam, 2009) such as the reading comprehension strategies of four gifted readers. This study involved only four participants and by no means makes a case for an imperative among all gifted readers. It is therefore limited to secondary gifted readers from the upper-middle socio-economic class who excel in school.

In addition, these four participants are either former or current students of mine with whom I have an excellent rapport. While each participant and his or her parent were thoroughly briefed on the need for complete honesty and each participant was chosen in the final analysis, in part, because of their integrity, some conditions may exist in which they were trying to make themselves look like good, model participants by exaggerating their study habits. In doing research for this dissertation, I found instances where other researchers have addressed the same concerns and concluded that a relationship with a participant is acceptable. Stockton (2010) stated that he would only report actual students' actions and

intentions; Altritcher *et. al.* (1993) argued that judging reliability in such situations could only be carried out on a restricted basis, so they focus on examining validity; Clark (2005) believes action researchers need to present an analysis of decisions made during the study to facilitate judgment of validity; Waterman (1998) believes that reflexive validity, in which the researchers' influences on a study enable the reader to evaluate the appropriateness of the influence, should be a component of such limitations.

The time frame of this study may also limit these findings. Participants documented two weeks of their habits and even though they understood it was to be what they normally do because I stressed to them "I want to know what makes you successful," other habits or attitudes may exist outside the two weeks that were not documented that would shed additional light on these findings. It should be noted that this study only looked at teenagers ages 15-16. Different age groups may have different needs or study habits that make them as successful.

These participants engage in deep reading as they study for conventional tests and writing projects. Much debate today focuses on the need to change the direction of education from a test-based culture to an interactive, problem solving culture. Gee (2011) in a recent speech to a Learning and the Brain Conference told the audience that we need to eliminate conventional forms of assessment and focus instead on the kind of problem solving skills induced by video games and other forms of modern technology that better mirror real life experiences. Teacher assessments and standardized tests are antiquated. This study did not look at deep reading skills in relation to anything else other than conventional testing.

The Three Common Cores of Control need to be explored further as they relate to the theory of deep reading. In addition to a broader population of gifted readers, research is also needed concerning participants with average ability and learning disabled students to see what impact, if any, deep reading makes on their student success. Do all successful students require the same type of environment to better guarantee success on teacher assessments and standardized tests?

In the documentary movie *Page One: Inside the New York Times* (2011), the staff of the newspaper cheered when the first Apple iPad appeared on the market because the device allowed for an authentic replication of the paper and is mobile enough to be read anywhere. The feeling among the staff was that the newspapers had found its niche among electronic devices and would become the trusted, dominant source of information that it enjoyed before the Internet. And since three of the participants state they like to read from paper or a book because they like to touch the object they are reading, will the touch of a mobile device fill the same void as paper and enable students to enter into a state of deep reading? Will the ability to emulate books engender the same process? And if students are taught to read from a computer, is touch vital to the deep reading process?

Further research needs to be conducted that relates how influential the home environment is to a student's optimal study environment. Two participants grew up in large, quiet homes where it is easy to be separate, alone and focused on their studies. Two other students have grown up in smaller, middle class homes where it is impossible to be separate, alone and focused on their studies without interruptions and distractions. What effect does the home environment have on the Most Restrictive Study Environment? Can a student be as

successful in a smaller, busier household as the students in the larger, spacious households? And are students able to adapt with more members in the household? The conditions of the home need to be investigated in relation to deep reading and academic success.

Deep reading should also be examined more closely with other types of learning and synthesis. In this study the participants were studying in order to excel on tests or papers, but as Gee (2009) and Tapscott (2010) have asserted, today's students have different challenges in front of them. Today's digital natives do not need to memorize as much. They consider tests antiquated forms of assessment that have no place among 21st century learners. Additional research should be conducted concerning the way the brain learns to master video games and other real world projects to see if the same deep reading process is part of this mastery.

Concluding Thoughts

When I sought to understand more about deep reading, it was never my intention to establish modern technology as a detriment to society's intellectual growth. I do not believe that we are raising a less intelligent generation because computers have become a dominant fixture among young people. Rather the purpose of my study was to understand how gifted readers achieved their academic success.

The debate about technology's impact on society is not new. Our 21st century debate parallels the days of the ancient Greeks when the written word exploded across the land and concerns about the quality of knowledge being disseminated grew alongside it; Socrates claimed the printed word limited a person's intelligence while Aristotle asserted it would deepen understanding and make this understanding available to more people (Wolf, 2007; Federman, 2010). While some researchers may believe that technology is making future

generations less intelligent and informed, others say it is making future generations smarter and more informed. This would demonstrate the cliché that the more things change, the more things remain the same.

Gee (2011) stated that we experience memory loss with new technological advancements. We do not memorize as much because we do not need to. Technology has been lifting that burden since the printed word became more accessible, and we need to embrace each new opportunity technology brings. As such he decries the testing culture as counterproductive to the challenges facing the new generation.

And so the debate continues. The participants in my study utilized deep reading skills primarily to pass tests, a strategy that has been shown to be successful for them. They do so because the educational system today insists that passing tests is how one demonstrates successful learning. I spent fifteen years in the business world prior to become an educator, and I have misgivings about this emphasis on tests and its correlation to success in the real world. I do believe deep reading plays an important role in our ability to learn and synthesize information, but I have come to conclude that these skills should be used for more than just passing teacher assessments or standardized tests.

Understanding how the brain operates and applying it to education is an exciting new frontier. Bridging educational techniques to neuroscience will help our students become successful students and adults in the real world. The quality of our students' education can only improve with more research into these new and vital areas.

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Appendix A

Parent Consent Form

Signed Consent Form

I agree to allow my son/daughter to participate in the research project entitled "The Reading Behaviors of Gifted Readers," which is being conducted by John Bradford, 280 Wentworth Drive, Canton, Georgia, 30114, 770-704-6396. I understand that this participation is voluntary and I may withdraw my consent at any time without penalty.

The following points have been explained to me:

1. The reason for the research is to collect data for completion of my dissertation which explores the reading behaviors of students who are gifted readers. Although there will be no direct benefit for you taking part in this study, the researcher may learn more about the reading habits of successful readers to help facilitate better reading habits among all students. The results of my findings will be discussed with your son/daughter and may help them develop even better study habits as they graduate into college.
2. The procedures are as follows:
 - a. Students will participate in a semi-structured, one-on-one interview with the researcher to ascertain previous reading behaviors and attitudes;
 - b. Students will complete a daily journal that documents their reading behaviors for a 2-week period;
 - c. Students will be observed at their home for one evening during the 2-week journaling period for one hour; a parent/caregiver must be on-site while this visit takes place;
 - d. Students and parents will discuss the findings and analysis of the journal, interviews, and observations.
3. There should be no discomfort or stress during this study. It is critical that students engage in their normal routine.
4. There are no known risks to participate in this study.
5. The results of this participation will be confidential and will not be released in any identifiable form without the prior consent of the participant unless required by law.
6. All participants in this study must be previously identified as gifted by the school system and score 90% or higher in the reading portion of the gifted testing. They should be of high school age (14-18) and actively enrolled as a full-time student at Scenic Heights High School in the Scenic Heights School District.
7. Results from the students' standardized test scores used to identify the student as gifted will be used in this study confidentially; results of students' teacher assessment will be used during the 2-week journaling period will be used in this study confidentially.

Signature of Participant, Date

Signature of Participant's Legally Authorized Representative, Date

Signature of Investigator, Date

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 1000 Chastain Road, #0112, Kennesaw, GA 30144-5591, (678) 797-2268.

Appendix B

Student Assent Form

Research Study Assent Form (15-17 Year Age Range)

Study Title: *Qualitative Research into the Reading Behaviors of Gifted Readers*

Researchers: *John Bradford; 280 Wentworth Drive; Canton, GA, 30114; 678-923-8326*

My name is John Bradford. I am from Kennesaw State University. I am inviting you to take part in a research study. Your parent(s) know we are talking with you about the study, but it is up to you to decide if you want to be in the study. This form will tell you about the study to help you decide whether or not you want to take part in it.

Why is this study being done?

The purpose of the study is to help us learn about the reading habits of students who have tested gifted by the Scenic Heights School District.

You are being asked to take part because you have been classified as a gifted student by Scenic Heightsunty and your reading scores are 90% or better in reading comprehension standardized tests.

You cannot take part in this study if you are not a gifted student and did not test 90% or better in reading comprehension standardized tests.

What am I being asked to do?

If you decide to be in the study, we will ask you to answer questions about your past reading habits, document your current study/reading habits in a 2-week journal that will be provided by the researcher, allow me to observe your reading and studying habits for a 1-hour period at your home, compare your test results to your study habits during the 2-week journaling period, and include your previous standardized test scores in the study. Important note: your actual name or address will never be disclosed during this study or written in the dissertation.

The procedures for this research project are outlined below:

- You will be interviewed by the researcher for a period of one-half hour to one hour before the journaling process begins. Questions will focus on your reading and studying habits (i.e. How much time do you study for each class?) and what you like to read (i.e. Do you prefer to read from a Kindle/screen or a turn-the-pages book?) and your reading habits when studying and/or reading for pleasure.
- You will journal your reading habits for a two week period from January 15-28. Each entry should take no more than ½ hour to complete

- The researcher will visit your home environment for one hour on a day and time that is mutually agreeable with you, your parents, and the researcher. During the visit you and one of your parents or caregivers must be on-site while the researcher visits. The purpose is to understand the environment in which you like to read and observe your habits as you go about reading
- Any comprehension tests you take for your teachers during the 2-week journaling period will be used for this research. The purpose is to compare your reading/studying habits with the results from your tests. Again, your name will be kept confidential.
- Previous standardized test scores will be included as background information for the research. Again, your name will be kept confidential.
- Results of your tests and the manner in which you studied will be discussed with members of the researcher's dissertation committee and fellow doctorate students before final conclusions are reached. Again, your name will be kept confidential.
- The results of your tests to your study habits will also be discussed with you and your parents/caregivers.

If at any time you do wish to answer a question when the researcher is interviewing you, you do not have to answer. Also, with your permission, the researcher will record our interview session, the home visit, and any discussions analyzing your reading/studying habits to your test scores. If you do not want our conversations recorded, they will not be.

What are the benefits to me for taking part in the study?

If you take part in this research project, you might learn how to better your study/reading habits although, as we have discussed, it is your current habits that we want to explore. Your success may prove to a model to future students and teachers who are helping students to become better scholars.

Are there any risks to me if I am in this study?

There are no potential risks or threats to you during this study. It is important that you do not change or alter your present reading or studying habits in any way to make this a successful study. What you are doing now is why you were asked to participate.

Will my information be kept private?

Your personal data for this study will always be kept confidential. That is, your real name or address will never be disclosed.

You will be given a pseudonym for this study. Your actual name and results will be known only to me, you, and your parents/caregivers.

Anyone else reviewing this study or reading the dissertation will not know your name or your address. Data will be stored on a recorder (with your permission) and on my home computer. Atlas software will help me analyze the results, and I will discuss these results with you and

your parent(s)/caregiver(s). In addition, I will discuss your results only with you and will not discuss your results with other participants nor disclose who else is participating in this study.

I will be the only one who will know your actual name, test results, and results of the data. The following will have access to your data (but not your name):

Dr. Alice Terry (dissertation chairperson);

Dr. Darren Crovitz (dissertation committee);

Dr. Ugena Whitlock (dissertation committee).

Fellow students of mine specializing in English Education in the doctorate program at KSU: Dr. Jason Pritchard, Dr. Patsy Hamby, Jennifer Grazer, Marcia Wright

The KSU Institutional Review Board (IRB)

When we tell other people or write articles about what we have learned in the study, we will not include your name or that of anyone else who took part in the study.

The data for this study will be kept for 3 years.

Are there any costs or payments for being in this study?

There will be no costs to you for taking part in this study.

You will not receive money or any other form of compensation for taking part in this study.

What are my rights as a research study volunteer?

Your participation in this research study is completely voluntary. You do not have to be a part of this study if you don't want to. There will be no penalty to you if you choose not to take part and no one will be upset or angry at you. You may choose not to answer any questions you don't want to answer, and you can change your mind and not be in the study at any time.

Who can I talk to if I have questions?

If you have questions at any time, you can ask the researchers and you can talk to your parent about the study. We will give you a copy of this form to keep. If you want to ask us questions about the study, call or email

John Bradford/678-923-8326/writerjohn77@gmail.com

The Kennesaw State University Institutional Review Board has reviewed this study to make sure that the rights and safety of people who take part in the study are protected. If you have questions about your rights in the study, or you are unhappy about something that happens to you in the study, you can contact them at (678) 797-2268 or irb@kennesaw.edu.

What does my signature on this consent form mean?

Your signature on this form means that:

- You understand the information given to you in this form
- You have been able to ask the researcher questions and state any concerns
- The researcher has answered your questions and concerns
- You believe you understand the research study and the potential benefits and risks that are involved.

Statement of Consent

I give my voluntary consent to take part in this study. I will be given a copy of this consent document for my records.

Signature of Participant

Date

Printed Name of Participant

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect.

I certify that when this person signs this form, to the best of my knowledge, he or she understands the purpose, procedures, potential benefits, and potential risks of participation.

I also certify that he or she:

- Speaks the language used to explain this research
- Reads well enough to understand this form or, if not, this person is able to hear and understand when the form is read to him or her
- Does not have any problems that could make it hard to understand what it means to take part in this research.

Name of parent who gave consent for child to participate

Signature of Person Obtaining Consent

Date

Permission to Record

_____ I give my voluntary consent to record my sessions with the researcher

_____ I do not give my consent to record my sessions with the researcher

Appendix C

Interview Protocol

Protocol for Semistructured Interview

1. Do you prefer to read from a computer/Kindle screen or from a turn-the-pages book/magazine? Why?
2. Do you prefer to read fiction or nonfiction?
3. Do you feel you comprehend better from reading from a computer/Kindle screen or from actual turn-the-pages book/magazine?
4. How much time each day do you study for each class?
5. How much study time do you spend reading and analyzing turn-the-pages books?
6. Anytime people study, they set up their room and study station with paper/pens for notes or computer screen for notes. What process do you go through in order to study something that you need to fully comprehend?
7. Okay. You have a new book or magazine that you can't wait to read. Tell me what you do when you are reading.
8. When you are reading to best understand the text (say, for a test), what is the environment like for you? How different is it than your casual reading environment?
9. When you read, sometimes are you also doing other things like texting, talking on the phone or something else? If so, how do you do that while you are reading? Do you think you comprehend the material as well when you are multitasking like that?

Appendix D

Journal Protocol

Journal Examples

Computer: Spent 1 hour on the computer. Studying my notes for a chem final. Read an article a teacher wanted us to read online. Article had three links that I followed and read. I checked my email three times for about 5 total minutes; I went onto Facebook for about 10 minutes. The rest of the time I stayed with the lesson. Dog kept barking.

Book: Studied my lit and social studies for ½ hour each. Checked my text messages through-out. I'd say I spent about 15 minutes total on my cell phone and text messaging. Annoying sibling kept screaming.

Read Chapters 10-12 of *Harry Potter* for ½ hour. Had no interruptions. Mom yelled a lot until Dad got home. Total 20 minutes of silence.

School: Social studies teacher gave us period to read chapter for test tomorrow. Listened to my iPod while I read. No interruptions the whole class.

Reading Journal for Sunday, January 22, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Monday, January 23, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Tuesday, January 24, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Wednesday, January 25, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much

time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Thursday, January 26, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Friday, January 27, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Saturday, January 28, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Sunday, January 29, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Monday, January 30, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Tuesday, January 31, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Wednesday, February 1, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that.

Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Thursday, February 2, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Reading Journal for Friday, February 3, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

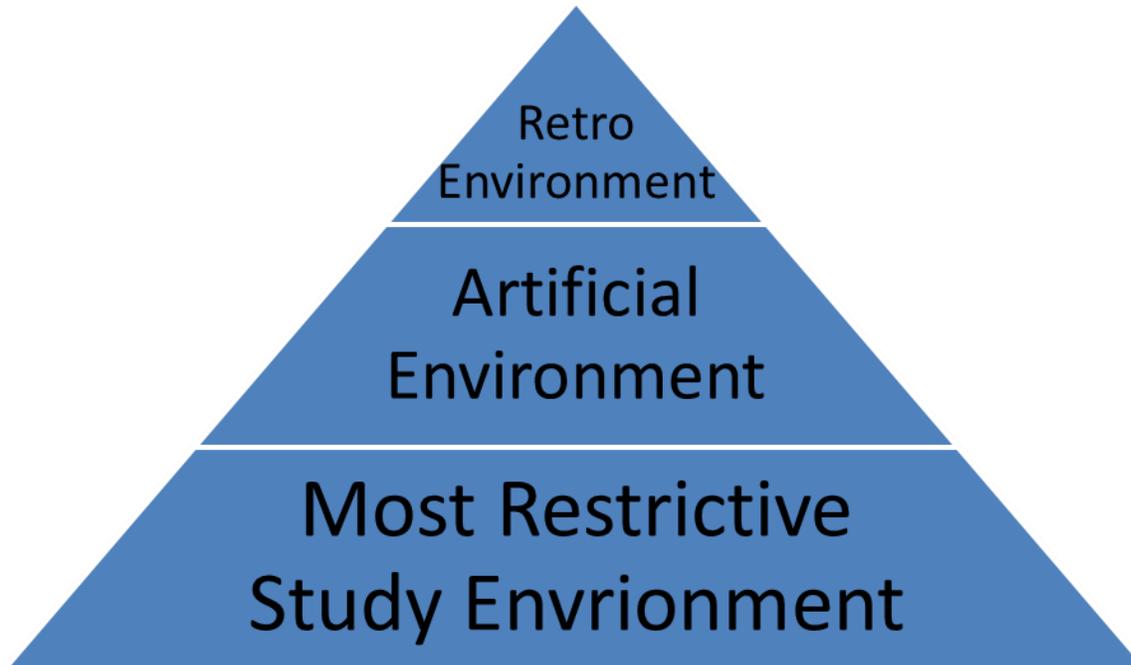
Reading Journal for Saturday, February 4, 2012

Please detail your reading habits by day in this journal, and please be very specific. Note especially what you are doing while you read (i.e. texting, listening to music) and how much time you spend doing each while reading. If you do nothing while reading, please note that. Also note when you are reading for pleasure and what you are reading as well as when you are reading to study. If you did not read on this date, please note that.

Appendix E

Three Common Cores of Control Pyramid

Three Common Cores of Control



In order to engage in Deep Reading, the four participants need to execute the Three Common Cores of Control: a Most Restrictive Study Environment of isolation, an Artificial Environment of absolute silence or music, and a Retro Environment that minimizes or eliminates interaction with technology.