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Background Knowledge and Its Effect on Standardized Reading
Comprehension Test Performance

By

Graziella Whipple Awabdy

A dissertation submitted in partial satisfaction of the requirements for the degree of

Doctor of Philosophy

in Education

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:
Professor P. David Pearson, Chair
Professor Frank C. Worrell
Professor Rodolfo Mendoza-Denton

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Abstract

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An investigation of the relationship between background knowledge and reading comprehension performance on standardized reading tests (the California STAR Test) was conducted with sixth, seventh, and eighth-grade ethnic minority children from low-income backgrounds ($N = 68$). Predictor variables examined included perceived background knowledge (overall and topic-specific), GPA, basic literacy skills, reading self-concept, race and ethnicity, language background, gender, and grade level. Research questions addressed participants' familiarity with topics discussed in STAR test reading passages and about the predictive nature of participant rankings and ratings of passages, as measured by the Topic Familiarity Ranking Measure and the Topic Familiarity Rating Scale. Results indicated that background knowledge of passage topics had a significant positive association ($p < .05$) with reading comprehension performance for 30% of the CST passages, for seventh and eighth-grade participants. Hierarchical regression analyses conducted on three of the passages showed that between 7% and 16% of the variance in reading comprehension performance was accounted for by background knowledge, as measured by the Topic Familiarity Rating Scale.

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Dedication and Acknowledgements

I dedicate this dissertation to Brian, my patient, loving, and wonderfully supportive husband, and Cole and Luke, my sweet boys. Without their smiles and laughter, words of encouragement, and steadfast support, I would not have been able to complete this project. I am so grateful and blessed to have all three of you in my life and look forward to spending even more time together now that I've completed my *big paper*. I also want to thank the rest of my family for offering their support through the successes and through the rough spots, especially my parents who not only provided child care when I needed it but offered continued optimism throughout this long journey. Finally, I would like to acknowledge and thank my dissertation committee, P. David Pearson, Frank C. Worrell, and Rodolfo Mendoza-Denton, for their patience, and willingness to teach and share their knowledge throughout the dissertation writing process.

CHAPTER 1
Background Knowledge and Its Effect on Reading Comprehension Test Performance
Research regarding the academic achievement gap between ethnic minorities and European Americans in the United States indicates that significant differences in reading performance exist between these groups beginning at school entry and persisting throughout the school years (Jencks & Phillips, 1998). A variety of explanations have been put forth in relation to the existence of an achievement gap within the reading domain. These explanations include genetic (Rushton & Jensen, 2005), socio-economic (Chall, Jacobs & Baldwin, 1990; Magnuson & Duncan, 2006; Thernstrom & Thernstrom, 2003), cultural (Heath, 1986), and school-based theories (Oakes, 1995). With regard to reading comprehension, particularly in the upper-elementary grades and beyond, differences in performance have been associated with (a) the amount of vocabulary a child knows (Anderson & Freebody, 1981), (b) the knowledge and usage of strategies taught for comprehension monitoring (Baker & Anderson, 1982), and (c) the depth and breadth of what children know about the world, which can also be referred to as *background knowledge* (Anderson & Pearson, 1984; Anderson, Reynolds, Schallert & Goetz, 1977; Bransford & Johnson, 1972).

These differences in performance have been readily observed on reading comprehension standardized tests, such as the California STAR Test. Though the recommended approach to enhance reading comprehension performance encompasses the three components listed above, there continues to be disagreement regarding how to best balance these components to create the most effective reading comprehension instruction. This point seems to be especially controversial when discussing reading comprehension instruction for children from disadvantaged backgrounds, one reason being because their performance on standardized tests is historically lower. By reviewing recommended approaches to reading comprehension outlined in research and examining the history of education policy and its effect on reading comprehension instruction and assessment over the last three decades, one can better understand the state of modern-day reading comprehension instructional and testing practices and how much of a role certain components, like those listed above, play in performance on standardized assessments like the California STAR test (CST).

Components that Affect Reading Comprehension
If we return to the discussion regarding what is known to contribute to reading comprehension, the three main components that affect this area of reading development are vocabulary knowledge, comprehension monitoring, and background knowledge (Snow, Burns, & Griffin, 1998). Two of these components, vocabulary knowledge and background knowledge, are more closely related because they contribute to the overall foundation of factual and situational knowledge that children access when trying to understand text. A key part of comprehension is an individual's conceptual foundation and knowledge of word meanings. Research has shown a strong correlation between vocabulary knowledge and reading comprehension and also that comprehension can suffer because of limited word knowledge (Anderson & Freebody, 1983; Kame'enui, Carnine, & Freshi, 1982; Marks, Doctorow, & Wittrock, 1984). Though a child may be considered skilled at decoding larger and complex words, his or her ability to recognize the related concept or meaning of the word will be critical in allowing comprehension to occur. Similarly, a reader's background knowledge can be crucial

to understanding what a text is really about. Research has shown a positive correlation between a reader's background knowledge and his or her ability to understand text (Anderson & Pearson, 1984; Anderson et al., 1977; Bransford & Johnson, 1972), as well as the separate contributions that background knowledge and word recognition skills make towards reading comprehension (Haenggi & Perfetti, 1994). Again, even though a child can decode a complicated sentence, this does not ensure that the child has the sufficient world knowledge to understand the meaning of the sentence, especially any subtle implications that are specific to a topic or body of knowledge.

The third component that is also thought to affect reading comprehension is comprehension monitoring, which is the ability to appropriately assess one's own understanding of the text (Baker & Anderson, 1982; Otero & Kintsch, 1992). In general, research suggests that training in the use of meta-cognitive skills improves comprehension (Brown, Palinscar, & Armbruster, 1984; Paris, Cross, & Lipson, 1984; Gambrell & Bales, 1986). However, the degree to which comprehension-monitoring strategies independently contribute to reading comprehension is still unknown. Therefore, it remains unclear whether the usage of these strategies is truly independent of the powerful effects of vocabulary and background knowledge (Snow et al., 1998).

Instruction addressing the three components discussed above has been greatly influenced by education policy and political climate over the last 30 years. It is important to discuss the history of educational changes that have occurred in recent decades in order to better understand the current educational agenda that influences reading comprehension instruction and assessment practices in public schools today.

Historical Trends in Reading Comprehension Instruction and Assessment Practices

Over the last 30 years, since *A Nation at Risk* (1983) was first published, educational recommendations and curriculum have shifted due to disagreements about how to teach American school children. In the 1980s, the rise of the first standards movement occurred in response to fears that America was falling behind in international educational comparisons. According to Ravitch (2010), this movement was later replicated by the rise of a new standards movement spearheaded by the *No Child Left Behind (*NCLB*)* Act (2001). Ravitch explained that the apparent downfall of the standards movement of the 1980s and 1990s was the result of an inability to agree on what should be taught, emphasized, and left out, specifically in more subjective areas such as history or literature. NCLB, however, fueled a regeneration of state educational standards, yet managed to do so without being too specific about what needed to be taught. The creation of ambiguous standards, in turn, successfully avoided the messy and contentious discussions that led to the downfall of the previous standards movement. Yet it also created an educational climate that emphasizes strategies and process over content and factual knowledge (Ravitch, 2010). This shift can be seen in the current educational curriculum, and also in the heavy use of standardized tests for measuring the academic performance of American school children. In order to avoid controversies over what to teach, schools and educators have been placed in a dilemma. Is it better to teach less about a variety of topics that increase children's knowledge of the world or to spend more time preparing children on how to compensate for the knowledge they don't have by arming them with an array of skills and strategies (Neuman, 2010)?

An emphasis on strategy-based instruction. With regard to reading comprehension instruction, the current educational trend has resulted in an emphasis on teaching numerous

comprehension-monitoring strategies and less of an emphasis on building up vocabulary and background knowledge. According to Willingham (2009), the current trend is to teach comprehension as a series of strategies to be practiced and mastered. Because of an educational climate that discourages explicit guidelines regarding what content should be taught, school districts have adopted methods that teach reading comprehension by offering students a set of strategies to use when reading text. And time spent on teaching these strategies often may come with the sacrifice of providing children with less opportunities to engage in texts that are rich in knowledge. The risk of this approach is that educators will ignore the premise that prior knowledge, including vocabulary and background knowledge, is the mainspring of reading comprehension.

Research investigating the relationship between background knowledge and comprehension in science instruction supports this argument. Taconis, Ferguson-Hessier, and Broekkamp (2001) conducted a meta-analysis that reviewed 22 studies related to instructional strategies for science classes offered at the upper-elementary grades and through college. Findings indicated that skill-focused approaches did not affect comprehension of science concepts at all, yet instruction that focused on developing the students' scientific knowledge base was very effective.

Though one strategy often taught in schools encourages students to *activate their background knowledge* when reading text, much less emphasis is placed on broadening children's knowledge through exposure to text laden with knowledge-building opportunities (Hirsch, 2006). According to a report by the RAND Reading Study Group (2002), comprehension strategies that are integrated with knowledge and understanding in a specific area allow for increased comprehension of content and for the increase in strategy use motivated by the act of learning. However, if strategies are taught in isolation and without explicitly defining their purpose to be as tools for knowledge seeking, students are less likely to learn the strategies and to be able to apply them in novel learning situations.

De-emphasizing content in early instruction. Another issue that seems to shift the focus away from increasing reading comprehension in the primary grades is the argument that decoding must be completely mastered before children begin to read and learn from content-heavy text. Of course, this part of reading instruction is critical; however, the premise of *learning to read* versus *reading to learn* that is often used as a reason to prevent students from engaging in content-rich text in the primary grades may be a faulty one (Pearson, 2001). This very delay in exposing students to expository texts that may broaden their background knowledge is one that may play a large role in creating the academic achievement gap that becomes apparent in fourth grade and beyond between children from different socio-economic backgrounds (Chall, Jacobs & Baldwin, 1990) and also between European American and non-Asian minority children, namely Hispanic and Black children (Thernstrom & Thernstrom, 2003). The National Reading Panel (2008) specified that early reading development would benefit from teaching of the following skills: decoding, oral reading fluency, comprehension, writing, and spelling. Neuman (2010) commented that this recommendation lists skills that are all *code-based* except for one, reading comprehension. The majority of activities that make-up reading instruction in pre-school and the primary grades is, however, focused on mastering the mechanical acts of reading, writing, and spelling. By excluding activities which introduce young

children to new knowledge and concepts, we risk the chance of creating future *word-callers*: students who can decode text but are unable to understand its meaning.

The latest changes in curriculum and instruction tend to de-emphasize activities that build vocabulary and background knowledge in students in the early grades and beyond. However, the results of these changes do not affect all children to the same degree. One of the most concerning results of this trend is the effect on reading comprehension of children who depend on their school experiences as the only way to increase their overall knowledge base.

Differences in Knowledge Between Students

Though each of the three components affecting reading comprehension is addressed in schools to varying degrees, the current trend seems to emphasize the teaching of strategies over focusing on increasing vocabulary and background knowledge. These two areas of knowledge, however, can be enhanced significantly through experiences outside the school. And these experiences will vary greatly depending on whether a student is from a home and community that is European American, affluent, and English-dominant or Hispanic, poor, and Spanish-dominant, for example.

Not only are huge differences in vocabulary knowledge already present at school entry between children of parents from poor and professional backgrounds (Hart & Risley, 1995), but also poverty predicts poor academic achievement even after controlling for ethnicity, family structure, and mother's education (Smith, Brooks-Gunn & Klebanov, 1997). According to Marzano (2004), access to academically-oriented experiences outside the home is less likely to occur in the lives of students from impoverished backgrounds. When ethnicity is factored in, it becomes apparent that ethnic minority children from poor backgrounds are even more at risk of academic underachievement and of missing out on supplementary experiences that would increase their vocabulary and background knowledge. Both African Americans and Hispanics are more than twice as likely as European Americans to live at or below the poverty line (U.S. Census Bureau, 2010). For many low-income ethnic minority children, public education is the sole provider of adequate instruction in reading comprehension, including instruction that increases their world knowledge and relevant academic vocabulary.

At first, one may assume that changes in instruction and curriculum that have been brought about in the last three decades would have similar effects on all children's achievement in reading. Differences in academic achievement, however, continue to exist on standardized reading tests in the area of reading comprehension between different ethnic and SES groups (Lee, 2006). It is plausible to argue, as Hirsch (1988; 2006) has, that some ethnic groups (the wealthier and the European American in particular) are privy to supplemental educational experiences outside their schools, which allows them to gain knowledge about the world and establish a foundation of background knowledge that prepares them to read and comprehend content-heavy text introduced in the upper-elementary grades and beyond. Children from less advantaged backgrounds, however, don't get this exposure to knowledge about the world in their everyday experiences, and may also not be getting it within classrooms where *content-free* strategies and skills prevail in reading instruction.

And once the decline in reading comprehension has begun, students fall further and further behind their peers. Referred to as the Matthew Effect, this *rich-get-richer and poor-get-poorer* phenomenon identifies the large gap seen between students who develop reading comprehension abilities at an early age and those whose abilities develop later and to a lesser

degree (Stanovich, 1986). The gains and losses are seen not only in reading performance (including vocabulary knowledge and comprehension) but also in general cognitive abilities as well (Cunningham & Stanovich, 2003). A lack of vocabulary and an insufficient knowledge base will continue to affect both reading comprehension and writing performance in content-area classes throughout the middle and high school years (Juel, 1988; Stanovich, 1986).

What is Being Tested on Standardized Reading Comprehension Tests?

Because of the current educational trend, it is important to consider whether or not students are being adequately instructed in reading comprehension and adequately prepared for standardized reading comprehension tests commonly used in public schools across America. One may presume that the testing developed to measure performance on what *is* being taught in the classroom would adequately reflect the emphasis on comprehension strategies over background knowledge in reading comprehension assessments. Yet, this may not be the case. The passages used in state standardized tests often deal with subject matter that requires quite a bit of prior knowledge for adequate comprehension to occur (Willingham, 2009). Hirsch (2006) further explained that these tests favor children who happen to possess domain knowledge related to these passages, and put children who are unfamiliar with the subject matter of the passages at a great disadvantage.

The CST, itself, mentions that students should be reading a substantial amount of texts independently (California Department of Education, 2008) as part of meeting the educational standards outlined for California, but this assumption becomes problematic when culture and socio-economic status are factored in. If, for whatever reason, children are not keeping up with the recommended home reading that builds background knowledge, they will have only their repertoire of content-free strategies to apply to test passages in order to deduce the answer to the test questions. Children will always vary in the amount of knowledge they bring to the classroom and in their skill level of using reading comprehension strategies. However, one wonders if the current approach being used for comprehension instruction is ineffective for those children who are not offered supplemental educational experiences outside of school and/or do not read independently on a regular basis. It seems that a goal of increasing background knowledge for children, and children of disadvantaged backgrounds especially, would aid in more adequately preparing all children for standardized reading comprehension tests such as the CST.

Furthermore, trying to assimilate the new information children are presented with while answering CST items regarding topics they are unfamiliar with will significantly slow them down. The large amount of new information they encounter during an entire testing situation could adversely affect their motivation and undermine their overall performance. According to Willingham (2009), children who do well on standardized reading tests are those who know a lot about the world. However, those who lack relevant background knowledge will attempt to reason their way through a text, which becomes "a recipe for creating a student who doesn't like reading" (Willingham, 2009, p. 2).

Johnston (1983) pointed out almost 30 years ago that, in general, the students who possess the most knowledge about the most passages will be those from economically-advantaged situations. And, because of the heavy loading of knowledge and vocabulary on intelligence tests, these will also be children of higher measured intelligence. Researchers also suggest that children from minority backgrounds do not often score well on standardized tests

because these tests are often based on the values and common experiences relevant to White middle-class populations (Obiakor & Utley, 1995).

With regard to research that has investigated the role of background knowledge on standardized test performance, few studies exist and focus on content-based tests such as standardized science tests. In a recent study, Visone (2010) examined issues associated with standardized tests designed to measure science content knowledge. Findings indicated that students referenced a lack of background knowledge as the most common reason that they were not able to answer an item on the test. These findings support previously mentioned studies that highlight the critical role of background knowledge in understanding text. Standardized reading comprehension tests presumably measure a child's ability to read and understand text. However, it appears that much more than this is being measured. Examining if and how much of a positive effect background knowledge may have on reading comprehension test performance is a necessary next step in reading comprehension research.

The Current Study

The aim of this study is to further examine the relationship between background knowledge and performance on standardized reading comprehension test items. Previous research has established the influence of vocabulary knowledge (Anderson & Freebody, 1981), comprehension monitoring (Baker & Anderson, 1982), and background knowledge (Anderson & Pearson, 1984; Anderson, Reynolds, Schallert & Goetz, 1977; Bransford & Johnson, 1972) on reading comprehension. However, there have been no investigations to date that examine whether or not background knowledge exerts a direct (i.e., specific knowledge about specific passages) or an indirect (i.e., knowing a lot about a lot of different topics) effect on standardized reading comprehension performance. Furthermore, no research exists which examines these issues specifically in low-income ethnic minority middle school children.

The goal of the current study was to investigate the relationship between background knowledge and performance on standardized reading comprehension tests for low-income middle school children of varying ethnicities and academic achievement histories. By examining these variables across different groups, the following questions can be addressed:

1. How familiar are students with the topics discussed in passages found in standardized reading comprehension tests?
2. Do the ratings and/or rankings of background knowledge that students assign to passage topics predict performance on standardized reading comprehension test items?
3. Given the range of explanatory variables available in the data set, what model best predicts achievement on the overall test?

The hypotheses that were examined in the current study involve the relationship between background knowledge and performance on standardized reading comprehension test questions from the CST as seen in low-income ethnic minority middle school students. First, it was predicted that background knowledge (as measured by topic familiarity) would show a positive correlation with reading comprehension ability per passage and overall test performance for all students. Second, it was also predicted that background knowledge would independently affect reading comprehension of individual passages and overall beyond the effects of previous academic achievement history, operationalized with cumulative GPAs. Investigating these questions will add to the current research in this area and provide additional information

regarding how background knowledge can affect reading comprehension for low-income ethnic minority children.

CHAPTER 2
Method
Context

This investigation focused on a group of ethnically diverse boys and girls in sixth, seventh, and eighth grades who were enrolled in a public middle school in the Mt. Diablo Unified School District. The school is located in a small suburb of eastern Contra Costa County with a population of 21,349 people as noted in the 2010 census. The students share certain demographic characteristics including attending a low-performing, high-poverty school that serves a large concentration of ethnic minority students. A total of 749 students attend the school, with 89% of these students qualifying for a free or reduced-price lunch. The racial and ethnic profile of the students at the school is as follows: 58% Hispanic White, 18% Non-Hispanic Black, 15% Non-Hispanic White, 8% Asian (with Fillipino as the major sub-group), and less than 1% American Indian or Pacific Islander. Twenty-eight percent of the students at the school are considered English language learners, with 98% of these students speaking Spanish as their native language. Other native languages spoken by students include Tagalog, Khmer, Vietnamese, Ilocano, Tongan, and Urdu. Students enrolled in the school also have varying academic histories, as measured by cumulative GPA.

Students from this school were specifically recruited to participate in this study in order to examine the relationship between background knowledge and reading comprehension performance on standardized tests for low-income ethnic minority groups. This population was also selected in order to identify if any cultural trends were present regarding background knowledge for CST reading passages.

Participants

Participants were 68 middle-school students. Participants were recruited from a group of students who were enrolled in one of the following three elective classes offered at the school during the 2011-2012 school year: Leadership, Autonomous Learner, and Community Service. Eighty-seven students from four classrooms were recruited initially, with 71 of these students agreeing to participate in the study. Data from three of these students were later removed from the sample because these individuals were absent for some or all of the data collection days, resulting in a total of 68 participants. The sample used in the study was 53% male and consisted of sixth ($n = 22$, 32% of students), seventh ($n = 20$, 29%), and eighth grade ($n = 26$, 38%) students. Participants ranged in age from 11 to 14 years old ($M = 12.13$, $SD = .85$). Participants belonged to the following racial and ethnic groups: Hispanic White ($n = 42$, 61.8%), Asian ($n = 19$, 28%), Non-Hispanic White ($n = 5$, 7.4%), Non-Hispanic Black ($n = 2$, 2.9%), and Pacific Islander ($n = 1$, 1.5%). The majority of participants ($n = 56$, 82.4%) spoke a language other than English in their home including Spanish, Tagalog, Vietnamese, Hindi, and Urdu.

Measures

In this study, demographic information was obtained through a self-report survey. Academic achievement was measured by cumulative GPA given through self-report and then verified by the participants' teachers. Background knowledge was measured in two ways: the Topic Familiarity Ranking Measure and the Topic Familiarity Rating Scale. Lastly, reading comprehension was measured using released test items from the CST English Language Arts (ELA) section.

Demographic background survey. Demographic information about participants in the study was collected through the use of a self-report survey. The survey was developed and administered by the investigator. The survey questions included items related to age, grade, sex, racial and ethnic background, cumulative GPA, and language background. A Likert-type rating scale item addressing participants' reading self-concept was also included in the survey. This item was intended to measure a participant's confidence level with texts in the classroom setting. The full measure is available in Appendix A.

Topic Familiarity Ranking Measure. Participants' background knowledge of specific topics was assessed by asking participants to rank 10 brief topic descriptions in order of familiarity from 1 to 10. These topics are those that appear in the reading passages of the CST (ELA section) that were administered to participants. Each topic description included a short summary of what the passage is about. The descriptions summarized the following passages: *Birds of Dreams*, *Letter to the Editor*, *Spotted Cats*, *Water Picture*, *More Than a Niece*, *The Animal Shelter of Sacramento County*, *The World's Fastest Human*, *Soft and Loud*, *Registration Form for League Baseball- Oak Mountain League*, and *Should Good Sportsmanship Be Taught In School*. The 10 summaries were handed out to each participant, labeled as Passage A through Passage J. The titles of the passages were not printed on the topic descriptions in order to avoid confusion.

To facilitate the task of ranking the 10 topic descriptions from least familiar to most familiar, descriptions were printed separately on strips of paper. Along with the topic descriptions, participants received instructions discussing the concept of *topic familiarity* and questions to think about while ranking the topics in order to clarify how to complete the ranking task. These questions included (a) *Have you run across this topic before?*, (b) *Are you familiar with some of the words used in this passage summary?*, and (c) *Have you read other texts about this topic before*? Participants were also given two envelopes labeled with their participant identification number and with the labels *Most Familiar* and *Least Familiar*. These envelopes were used in the ranking process, which will be further explained in the Procedures section. The investigator developed this measure to assess participants' background knowledge of a topic in relation to the other topics used on the CST (by use of forced ranking). A secondary background knowledge measure (Topic Familiarity Ranking Scale) was also used in this study to measure background knowledge using a non-forced rank measure. The full measure is available in Appendix A.

CST: ELA section. Reading comprehension was assessed using released test items from the CST, ELA section. The items and related passages used covered the following reading standards determined by the state of California: Word Analysis, Reading Comprehension, and Literary Response and Analysis. Items and related passages that primarily addressed the writing standards of Writing Strategies and Written Conventions were generally not administered to participants. However, six test items that addressed writing standards were administered to participants, as they were included in sections that generally addressed the targeted reading standards. These items were later removed from the results during data analysis when determining reading comprehension performance for individual passages and for the overall test. Because these items were skill-based and not significantly dependent on background knowledge, performance on these test items were used to calculate a basic literacy skills score that could be compared to other predictor variables and to reading comprehension performance.

Ten passages from the sixth-grade CST ELA section were used. Passages included approximately four questions each, with 43 total questions on the whole test. The sixth-grade version of the test was administered to participants, regardless of participant grade level, in order to maximize the amount of comparable data from background knowledge and reading comprehension measures. The 10 passages chosen were thought to represent a broad range of topics, from those that included more general knowledge to those that included more specialized knowledge.

Word Analysis strand. This standards area addresses word analysis, fluency, and systematic vocabulary development. Skills needed to meet this standards area include using knowledge of word origins, word relationships, and historical and contextual clues to understand the meaning of age-appropriate vocabulary. Specific standards included in this strand include: 6RW1.2, 6RW1.3, 6RW1.4, and 6RW1.5. See Table 1 for information on which items address each targeted Reading standard.

Reading Comprehension strand. This standards area addresses reading comprehension of informational texts. Skills needed to meet this standards area include the ability to read age-appropriate text and to connect ideas, arguments, and perspectives within text. As documented in the 2008 CST Released Test Questions, this standards area also assumes that "by grade eight, students read one million words annually on their own, including a good representation of grade-level-appropriate narrative and expository text" (p. 3, California Department of Education). Specific standards included in this strand include: 6RC2.1, 6RC2.2, 6RC2.3, 6RC2.4, 6RC2.5, 6RC2.6, 6RC2.7, and 6RC2.8. See Table 1 for information on which items address each targeted Reading standard.

Literary Response and Analysis strand. This standards area addresses literary response and analysis of culturally or historically important literary works. Skills developed to meet this standards area include the ability to clarify ideas and connect them to other literary texts. Specific standards included in this strand include: 6RL3.1, 6RL3.2, 6RL3.3, 6RL3.4, 6RL3.5, 6RL3.6, 6RL3.7, and 6RL3.8. See Table 1 for information on which items address each targeted Reading standard.

Topic Familiarity Rating Scale. Participants' background knowledge of topics discussed in the CST reading passages was also assessed using a four-point Likert-type scale created by the investigator. This scale ranges from 1 (*Not familiar at all)* to 4 (*Very familiar*). Students completed the corresponding items for this scale after reading each test passage and before reading the accompanying standardized test items for each passage. This scale was used to measure background knowledge after reading each passage and to determine the reliability of the Topic Familiarity Ranking Measure. The full measure is available in Appendix A.

The values for Familiarity Rating for each passage were totaled for each participant and used to create a new continuous variable that represented the perceived overall background knowledge regarding all topics used in the CST. This was done in order to attain a value of general breadth of knowledge score.

Table 1
California Educational Standards Addressed by CST ELA Passages and Items

CST Passage	Related CST Items	California Standard Addressed
Bird of Dreams	1, 2, 3, 4	6RL3.5, 6RL3.7, 6RL3.6, 6RL3.4
Letter to Editor	5[a], 6, 7, 8	6RW1.2, 6RC2.6, 6RC2.3, 6RC2.3
Spotted Cats	9, 10, 11	6RC2.3, 6RC2.8, 6RC2.4
Water Picture	12[a], 13, 14, 15, 16	6RW1.4, 6RL3.4, 6RL3.4, 6RL3.4
President's Niece	17, 18, 19, 20, 21	6RC2.3, 6RL3.8, 6RC2.3, 6RC2.7, 6RC2.7
Animal Shelter	22, 23 24, 25[a], 26, 27	6RC2.5, 6RC2.5, 6RC2.8, 6RW1.5, 6RC2.3, 6RC2.8
Fastest Human	28, 29, 30,31	6RL3.8, 6RL3.7, 6RL3.1, 6RC2.1
Soft and Loud	32[a], 33, 34,35	6RW1.3, 6RC2.6, 6RC2.7, 6RC2.2
Baseball Registration	36, 37, 38	6RC2.5, 6RC2.5, 6RC2.8
Sportsmanship	39[a], 40, 41, 42, 43[a]	6RW1.2, 6RC2.8, 6RC2.8, 6RC2.3, 6RW1.2

[a]Item removed from reading comprehension performance results because it addressed a Writing strand standard.

Procedure

To begin with, the investigator contacted the principal of the school the semester prior to data collection to arrange for recruitment of participants. The principal designated three elective subjects as classes which participants could be recruited from. The investigator met with the three teachers of the elective classes (Autonomous Learner, Leadership, and Community Service) to discuss the study and schedule data collection. Participants were recruited from four classrooms in total (Community Service was offered during two periods).

Parent information letters describing the study were sent home with potential participants during the fall semester of 2011. Letters were available in English and Spanish versions. The letters are available in Appendix A. One week later, the investigator gave an informational presentation to potential participants in each classroom. The investigator returned to the classrooms the following week to collect written assent forms from participants and to begin data collection. All data collection occurred in the classrooms participants normally attended for their elective classes.

During the first data collection visit, the investigator collected demographic information from the participants by administering the demographic background survey. Participants were administered the survey in four groups, corresponding to the four participating classrooms. Students that chose not to participate in the research activities sat in the back of the classroom and read silently during administration of the measures.

During the same visit, participants were also administered the Topic Familiarity Ranking Measure. This measure was used to determine the relative level of background knowledge that participants had for specific topics that appeared in reading passages used in the ELA section of the sixth grade practice CST, a test that was later administered to participants. First, the topic descriptions, two envelopes, and written instructions were distributed to the participants. The instructions were read aloud to the participants as they read along. The investigator explained the concept of *topic familiarity* and what students should be thinking about when ranking the topic descriptions. The topic descriptions were read aloud next and the participants were asked to read along and place each strip into a *least familiar* or *most familiar* pile. After the investigator finished reading aloud all of the topic descriptions, the participants were asked to examine their familiarity piles once more and continue sorting the strips of paper until five descriptions were in each pile. Participants were then asked to rank the topic descriptions piled in the *least familiar* pile from 1 to 5 according to familiarity (with rank 1 being the least familiar) by writing a unique rank number on each description strip. Participants were then asked to rank the topic descriptions piled in the *most familiar* pile from 6 to 10 (with 10 being the most familiar) by writing a unique rank number on each description strip. The investigator instructed participants to place the ranked topic descriptions into the corresponding envelope (*least familiar* and *most familiar*) once participants had completed the ranking task. The results of this task were compiled by the investigator and arranged in rank from least to most familiar topic for each participant.

One week later, reading passages and released test items from the ELA section of the sixth grade CST were administered to all participants. During this visit, participants were asked to read the passages, rate them for familiarity using the Topic Familiarity Rating Scale, and then answer the related standardized test items following each passage. Participants were administered the measures in four groups, corresponding to the four participating classrooms. Both the investigator and classroom teacher were present during the CST administration. The investigator reviewed each of the participants' test and Topic Familiarity Rating Scale before collecting them to ensure that all items had been completed.

One month later, after preliminary analysis of the data had been conducted, the three teachers of the classes that participated in the study were asked to review the CST reading passages that had been given to the students and rate the passages according to how familiar they thought their students were with each passage. Teachers were then interviewed regarding their ratings and any discrepancies found between their predictions and the actual ratings given by their students. Teachers were also asked to discuss the issue of cultural relevance with regard to each reading passage and whether or not they felt that the CST items were a good measure of reading comprehension for this particular group of students.

The predictor variables that were examined in this study include Topic Familiarity (or background knowledge), Academic Achievement, Basic Literacy Skills, Reading Self-concept, Race and Ethnicity, Language Background, Gender, and Grade level. The outcome variable that was examined was Reading Comprehension on the CST overall and per individual passage.

Analyses

Research question one: How familiar are students with the topics discussed in passages found in standardized reading comprehension tests? To examine topic familiarity levels for the CST reading passages, several variables were used. Background knowledge

variables included Familiarity Ranking, Individual Familiarity Rating, and Total Familiarity Rating scores.   For Familiarity Ranking scores, frequencies, median ranks, and mode ranks were calculated for each of the 10 passages. Because this variable used values that were force-ranked in order to better understand participants' background knowledge of a topic relative to other topics on the CST, group means and standard deviations were not derived. However, median ranks for passages were compared to each other to estimate if participants, as a whole, ranked certain topics as less or more familiar in relation to other passages. For Individual Familiarity Rating scores, frequencies, means, and standard deviations were calculated for each passage. For Total Familiarity Rating scores, means and standard deviations were calculated and distributions were examined for all participants overall and by grade level.

   Research question two: Do the ratings and/or rankings of background knowledge that students assign to passage topics predict performance on standardized reading comprehension test items? The relationship between background knowledge and reading comprehension performance was examined. Regression analyses were conducted using all predictor variables and outcome variables.

   Research question three: Given the range of explanatory variables available in the data set, what model best predicts reading comprehension on the overall test? Hierarchical regression analyses were performed to explore the relationship between all explanatory variables and overall reading comprehension to identify the best-fit regression model. These variables included Individual Familiarity Rating and Total Familiarity Rating, Academic Achievement, Basic Literacy Skills, Reading Self-concept, Gender, Language Background, Race and Ethnicity, and Grade Level. The best-fit model was then used to conduct regression analyses individual passages. These analyses were used to investigate whether or not background knowledge significantly contributed to predicting performance on standardized reading comprehension tests beyond the effect of other predictor variables.

   Data collected regarding participants' background knowledge and reading comprehension performance were combined into multiple variables for the purposes of data analysis. Data collected regarding participants' race and ethnicity was recoded from a categorical variable into multiple dichotomous variables using *dummy coding*. The following racial and ethnic background categories were used: White (Non-Hispanic), White Hispanic, Black (Non-Hispanic), and Asian. Statistical analyses were conducted using IBM® SPSS® Statistics software, version 20.0.

CHAPTER 3
Results

In this chapter, information is presented regarding the background knowledge of participants, how participants performed on the CST overall and per passage, and the relationship of predictor variables and reading comprehension on the CST. Also, hierarchical regression analyses are reported.

Background Knowledge of Participants

Results from the Topic Familiarity Ranking Measure. Familiarity Ranking represents the rankings participants gave to each reading passage. Because this variable used data that is force-ranked, means and standard deviations are not reported. Passages were ranked from least familiar to most familiar, using ranks 1 through 10 respectively.

For Bird of Dreams, the following description was given to participants for ranking purposes:

> *This reading passage is a poem about a Phoenix, a Greek mythological creature. It includes descriptive language about the Phoenix such as the phrases: "flaming pyre," "ashen pile, " and "feathers luminous and bright" in a lyrical writing style.*

As can be seen in Figure 1, 26.5% of the participants gave a familiarity ranking of "1" to the Bird of Dreams passage. This rank was at least twice as common as any other rank given. A mode of 1 and a median of 4 suggest that this passage is among the least familiar of the passages. For Letter to Editor, the following description was given to participants for ranking purposes:

> *This reading passage is an editorial piece about whether or not a large movie theater should be built in a local shopping center. It includes information about movie theaters and video rental stores. It also discusses the advantages of watching a movie in a theater or at home on your television.*

As can be seen in Figure 1, 32.4% of the participants gave a familiarity ranking of "8" or "10" to the Letter to Editor passage. Modes of 8 and 10 and a median of 7 suggest that this passage is among the most familiar of the passages.

For Spotted Cats, the following description was given to participants for ranking purposes:

> *This reading passage is an informational text on members of the "Big Cat" family. It includes information on leopards, jaguars, and cheetahs. It also discusses details about each type of "Big Cat" and the different parts of the world the animals live in.*

As can be seen in Figure 1, 22.1% of the participants gave a familiarity ranking of "10" and 19.1% of the participants gave a ranking of "7" to the Spotted Cats passage. A mode of 10 and a median of 7 suggest that this passage is among the most familiar of the passages.

For Water Picture, the following description was given to participants for ranking purposes:

> *This reading passage is a poem about a pond in a park. It includes descriptive information and language about the different types of things you may see on a typical day in a park and how these things would look reflected on the water.*

As can be seen in Figure 1, 25% of the participants gave a familiarity ranking of "9" to the Water Picture passage. This ranking was at least 10% higher than any other ranking given. A mode of 9 and a median of 7 suggest that this passage is among the most familiar of the passages.
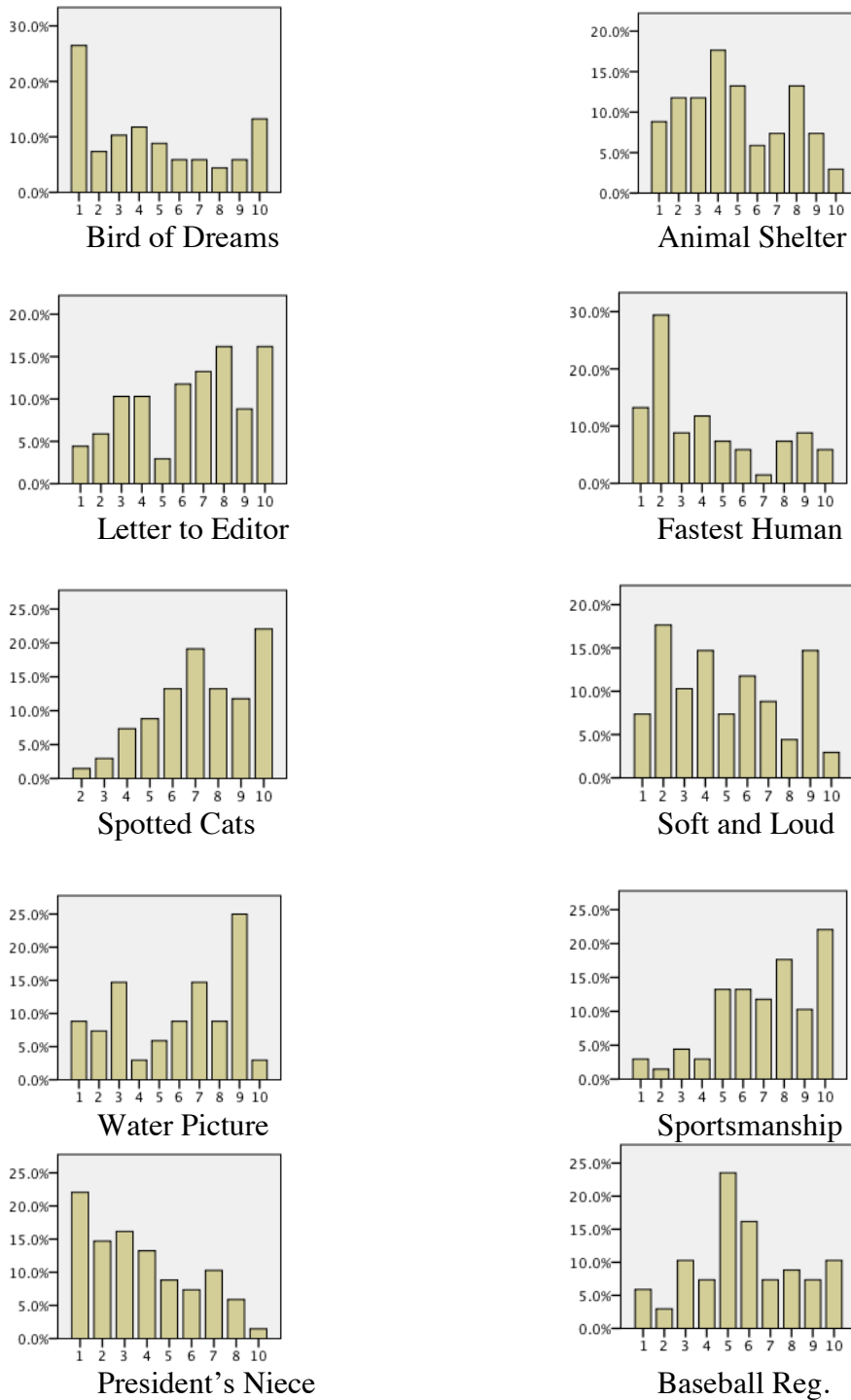
Figure 1. Frequency distributions of topic familiarity rankings for all passages.

For President's Niece, the following description was given to participants for ranking purposes:

> *This reading passage is a story about the niece of a former president. It includes historical information about what it was like to live in the White House and what types of social activities occurred in the White House during the mid-19th century.*

As can be seen in Figure 1, 22.1% of the participants gave a familiarity ranking of "1" and to the President's Niece passage. A mode of 1 and a median of 3 suggest that this passage is among the least familiar of the passages.

For Animal Shelter, the following description was given to participants for ranking purposes:

> *This reading passage contains three separate documents. The first is a descriptive text about a local animal shelter. It includes information about volunteering at the shelter and the types of jobs that volunteers can do at the shelter such as being a Dog Nuzzler, Cat Snuggler, or Kennel Aide. The second and third documents are forms used when applying to be a volunteer at the shelter. They require personal information to be filled in.*

As can be seen in Figure 1, 17.6% of the participants gave a familiarity ranking of "4" and to the Animal Shelter passage. A mode of 4 and a median of 4.5 suggest that this passage is neither among the least or most familiar of the passages.

For Fastest Human, the following description was given to participants for ranking purposes:

> *This reading passage is a story about Quincy ad Jesse Owens, brothers that lived in the 20th century. It includes a narrative about children racing each other and about Jesse being the fastest boy. It is based on a former African-American Olympian who won four medals at the Olympic games in Berlin, Germany.*

As can be seen in Figure 1, 29.4% of the participants gave a familiarity ranking of "2" to the Fastest Human passage. This ranking was given at least twice as often as any other ranking. A mode of 2 and a median of 3 suggest that this passage is among the least familiar of the passages.

For Soft and Loud, the following description was given to participants for ranking purposes:

> *This reading passage is an informational text about pianos and other stringed instruments. It discusses historical and factual knowledge about how stringed instruments like the piano, violin, harp, hammer dulcimer, and harpsichord work.*

As can be seen in Figure 1, 17.6% of the participants gave a familiarity ranking of "2" and 14.7% of the participants gave a ranking of "9" or "4" to the Soft and Loud passage. However, a mode of 2 and a median of 4.5 suggest that this passage is neither among the least for most familiar of the passages.

For Sportsmanship, the following description was given to participants for ranking purposes:

> *This reading passage is an opinion piece that argues for teaching good sportsmanship to children in school. It includes information on competitive activities, playing fair, following rules, getting frustrated with others, and working together as a team.*

As can be seen in Figure 1, 22.1% of the participants gave a familiarity ranking of "10" to the Sportsmanship passage. A mode of 10 and a median of 7.5 suggest that this passage is among the most familiar of the passages.

For Baseball Registration, the following description was given to participants for ranking purposes:

> *This reading passage contains two documents. The first is a form that includes information about how to register to be on a baseball team. It discusses who can play in the baseball league, how old they have to be, when the tryouts are, and when you have to turn in the registration form. The second document is a flyer advertising a sale on baseball apparel from a local store.*

As can be seen in Figure 1, 23.5% of the participants gave a familiarity ranking of "5" to the Baseball Registration passage. A mode of 5 and a median of 5.5 suggest that this passage is neither among the least or most familiar of the passages.

As seen in Table 2, these findings indicate that participants ranked topics from least to most familiar (based on median ranks for each passage) in the following order: Fastest Human, President's Niece, Bird of Dreams, Animal Shelter, Soft and Loud, Baseball Registration, Spotted Cats, Water Picture, Letter to Editor, and Sportsmanship. Overall, four passages had median rankings that were considered to be relatively familiar to participants (Letter to Editor, Spotted Cats, Water Picture, and Sportsmanship), three passages had median rankings that were considered to be relatively unfamiliar to participants (Bird of Dreams, President's Niece, and Fastest Human), and three passages had median rankings that were considered neither familiar or unfamiliar to participants (Animal Shelter, Soft and Loud, and Baseball Registration). Median ranks for all passages can be found in Table 2.

Results from the Topic Familiarity Rating Measure. Whereas the Topic Familiarity Ranking Measure was provided prior to seeing the passages, the Topic Familiarity Rating Measure represents the ratings participants gave to each passage while taking the CST. Passages were rated using a Likert-type scale with the following values: 1 = *Not familiar at all*, 2 = *A little familiar*, 3 = *Somewhat familiar*, and 4 = *Very familiar*. Participants rated each passage after reading it but before answering the passage items. Findings indicated that participants rated topics from least to most familiar (based on mean ratings for each passage) in the following order: President's Niece, Water Picture, Bird of Dreams, Soft and Loud, Fastest Human, Letter to Editor, Sportsmanship, Animal Shelter, Baseball Registration, and Spotted Cats. Mean ratings for each passage can be found in Table 2.

Table 2

Descriptive Statistics for Reading Comprehension Performance and Background Knowledge Rankings and Ratings Per Passage

	Mdn Rank (1-10)	*M* Rating (1-4)	*r* for Rank/ Rating	*r* for Rank/ RC (7th/8th)	*r* for Rating/ RC (7th/8th)	*M (SD)* for RC Items	# of Items in Passage	*M %* Correct for RC Items
Fastest Human	3	2.72	.43**	.04	.10	2.18 (1.15)	4	54.41%
President's Niece	3	2.10	.23	-.17	.44**	3.09 (1.32)	5	61.77%
Bird of Dreams	4	2.25	.40**	.07	.13	2.90 (1.21)	4	72.43%
Animal Shelter	4.5	2.97	.12	.11	.06	2.56 (1.42)	5	51.18%
Soft and Loud	4.5	2.50	.32**	.08	.12	1.44 (1.03)	3	48.04%
Baseball Registration	5.5	3.07	-.17	.01	.20	1.32 (0.82)	3	44.12%
Spotted Cats	7	3.90	.29*	.03	.12	2.00 (0.93)	3	66.67%
Water Picture	7	2.16	.21	-.12	.35*	2.38 (1.08)	4	59.56%
Letter to Editor	7	2.84	.21	-.15	.07	1.57 (0.94)	3	52.45%
Sportsmanship	7.5	2.91	.09	-.07	.13	1.59 (0.98)	3	52.94%
Overall CST	N/A	N/A	N/A	N/A	N/A	20.46 (6.6)	36	56.84%

Note: RC = reading comprehension performance.

* p < .05, ** p < .01

Comparing findings of background knowledge measures. The two background knowledge measures were compared to determine the consistency between the measures in determining background knowledge. The relationship of scores between the two background knowledge measures was assessed for each passage using the Pearson product-moment correlation coefficient, with significance based on a two-tailed analysis. Findings were inclusive of all grade levels. Significant positive associations were found for Bird of Dreams, Spotted Cats, Animal Shelter, and Soft and Loud. As seen in Table 2, positive associations (non-significant) were found for Letter to Editor, Water Picture, President's Niece, Fastest Human, and Baseball. A negative association (non-significant) was found for Sportsmanship. These findings indicated that the two background knowledge measures showed positive correlations for all passages, except one passage. However, the overall correlation between measures was weak as only four passages showed significant positive correlations with medium effect sizes.

Comparing background knowledge findings to reading comprehension findings. The relationship of scores between the two background knowledge measures (ranks and ratings) and reading comprehension performance was assessed for each passage using the Pearson product-moment correlation coefficient, with significance based on a two-tailed analysis. Findings were inclusive of seventh and eighth-grade participants only. Significant positive correlations were found between ratings and reading comprehension for two passages, President's Niece (*p* < .01) and Water Picture (*p* < .05). Ratings for the rest of the CST passages were found to have positive non-significant correlations with reading comprehension performance. No significant positive associations were found for ranks of CST passages and reading comprehension performance on each passage. Non-significant positive associations were found for six of the

passages (Fastest Human, Bird of Dreams, Animal Shelter, Soft and Loud, Baseball Registration, and Spotted Cats) and negative associations were found for the remaining four passages (President's Niece, Water Picture, Letter to Editor, and Sportsmanship). Overall, the Topic Familiarity Rating Measure had more positive associations between background knowledge and reading comprehension performance per passage.

General background knowledge findings. Total Familiarity Rating is the totaled value for all the passage ratings given. This variable represents overall perceived general knowledge of participants for all of the topics discussed on the CST. The distribution for Total Familiarity Rating for all grades ($N = 68$, $M = 26.82$, $SD = 4.47$, skew = -0.66, kurtosis = 0.28) was moderately skewed (in a positive direction), as well as the distribution for seventh-graders only ($N = 20$, $M = 28.15$, $SD = 3.87$, skew = -0.11, kurtosis = -0.63). The distribution for Total Familiarity Rating for sixth-graders ($N = 22$, $M = 26.64$, $SD = 4.52$, skew = -0.40, kurtosis = -0.43) was approximately symmetric. However, the distribution for eighth-graders ($N = 26$, $M = 25.96$, $SD = 4.78$, skew = -1.02, kurtosis = 0.45) was highly skewed (in a positive direction).

The findings indicated that seventh-graders perceived themselves to have the highest amount of general background knowledge, with sixth-graders perceiving themselves to have the second highest, and eighth-graders perceiving themselves to have the least amount of general background knowledge on the CST topics. However, significant differences in background knowledge were not found among sixth, seventh, and eighth-grade participants, $F (2, 67) = 1.40$, $p = .254$.

Reading Comprehension Performance on the CST

Reading comprehension performance was examined using overall performance on the CST as well as performance on each passage. Overall CST performance was based on 36 test items that focused on ELA standards. The distribution for reading comprehension for all grades ($M = 20.46$, $SD = 6.6$, skew = -3.96, kurtosis = -3.06) was highly skewed (in a positive direction), as well as the distribution for seventh-graders only ($M = 22.77$, $SD = 5.77$, skew = -1.18, kurtosis = 2.60). The distribution for reading comprehension for sixth-graders ($M = 15.73$, $SD = 5.8$, skew = -0.18, kurtosis = -0.73) as well as for eighth-graders ($M = 22.7$, $SD = 5.71$, skew = -0.17, kurtosis = -0.73) was approximately symmetric.

The findings indicated that sixth-graders scored much lower (43.7% mean items correct) on overall CST reading comprehension than seventh (63.24%) and eighth-grade (63.06%) participants, who did not differ substantially. When comparing differences in reading comprehension means for each grade, significant differences in performance were found among sixth, seventh, and eighth-grade participants, $F (2, 67) = 11.53$, $p < .01$.

Influences on reading comprehension performance on the CST overall. To identify the effects of predictor variables on overall CST reading comprehension performance, hierarchical regression analyses were conducted using all relevant variables, clustered into three blocks. Block 1 included three academic variables (GPA, Reading Self-concept, and Basic Literacy Skills), Block 2 included three demographic variables (Gender, Race and Ethnicity, and Language Background), and Block 3 included a background knowledge variable (Total Topic Familiarity). Overall, as seen in Table 3, the academic, demographic, and background knowledge variables accounted for 61.7% of the variance in overall reading comprehension performance on the CST.

Table 3

Variance in Overall CST Reading Comprehension Performance Accounted for by Academic, Demographic, and Background Knowledge Variables

	Beta	*t*	Adjusted R^2	ΔR^2
Block 1 (Academic)				
GPA	.124	1.34	9%	
Reading Self-Concept	.252	3.04**	20%	
Basic Literacy Skills	.626	7.28**	55.5%	55.5%
Block 2 (Demographics)				
Gender	.031	.342		
Race and Ethnicity	.176	1.78		
Language Background	-.074	-.776	55.9%	0.4%
Block 3 (Background Knowledge)				
Total Topic Familiarity	.262	3.15**	61.7%	5.8%

*p < .05, **p < .01

    The Block 1 analysis was statistically significant, $F(3, 64) = 28.91, p < .01$, accounting for more than 50% of the variance in reading comprehension, as seen in Table 3. Both Reading Self-concept and Basic Literacy Skills were significant contributors, but GPA was not

    The second block of variables added to the analysis included all demographic predictor variables to identify if these variables explained any additional variance in overall reading comprehension performance on the CST. Although the regression equation was also significant after the demographic variables were added in Block 2, $F(8, 59) = 11.61, p < .01$, Adj. $R^2 = 0.559$, these variables contributed less than 1% of variance and none of the contributions was statistically significant. Total Topic Familiarity, a background knowledge variable, was added to the analysis in the third and final block of variables. The equation was statistically significant, $F(9, 58) = 12.97, p < .01$, Adj. $R^2 = 0.617$, with background knowledge accounting for an additional 5.8% of the variance in predicting overall reading comprehension performance on the CST; as can be seen in Table 3, Total Topic Familiarity was a significant contributor to the equation.

    Examining the effect of grade level on reading comprehension. Results indicated that sixth-graders performed significantly lower than seventh and eight-graders on overall reading comprehension performance. Feedback collected during teacher interviews after the CST had been administered to the participants indicated that sixth-graders were generally overwhelmed by the difficulty level and length of the CST reading passages. Teachers also reported that the vocabulary in many of the passages included unfamiliar words and abstract content that many of the sixth-graders would have difficulty understanding. The CST-released passages and items used in this study were also designed to be used at the end of the sixth-grade year but were administered to study participants in the middle of the year. These observations suggest that the CST passages and items used in this study were too difficult for mid-year sixth-graders. With this in mind, I decided to conduct further analyses involving predictor variables and reading comprehension performance per passage using only seventh and eight-grade participants.

    Influences on reading comprehension performance for each CST passage. To examine relationships between predictor variables and reading comprehension performance for

each passage, hierarchical analyses were conducted for individual passages. As mentioned before, these analyses involved only certain variables that had made significant contributions in previous analyses. The predictor variables used were clustered into two blocks and included academic (Basic Literacy Skills and Reading Self-concept) and background knowledge (both Total Topic Familiarity and Individual Topic Familiarity) variables. The individual knowledge variable was added to determine the influence of knowledge of a specific topic versus general knowledge of all topics discussed on the CST. These analyses were conducted using data for seventh and eight-grade participants only ($N = 46$) and results are presented in Table 4.

  Bird of Dreams passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 8.39, p < .01, and accounted for 24.7% of the variance in predicting reading comprehension performance, with Reading Self-concept and Basic Literacy Skills contributing significantly (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Letter to Editor passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 3.99, p < .05, and accounted for 11.8% of the variance in predicting reading comprehension performance, with Reading Self-concept being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

  Spotted Cats passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 3.91, p < .05, and accounted for 11.4% of the variance in predicting reading comprehension performance, with Reading Self-concept being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity. This analysis was statistically significant, F (4, 41) = 4.48, p < .01, and accounted for 12.2% of the variance in predicting reading comprehension performance for this passage (see Table 4).

  Water Picture passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills, and did not contribute significantly to reading comprehension on this passage. The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity. This analysis was statistically significant, F (4, 41) = 3.51, p < .05, and accounted for 16.8% of the variance in predicting reading comprehension performance for this passage (see Table 4).

  President's Niece passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 4.16, p < .05, and accounted for 12.3% of the variance in predicting reading comprehension performance, with Basic Literacy Skills being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Table 4

Variance in CST Reading Comprehension Performance per Passage Accounted for by Academic and Background Knowledge Variables

	Bird of Dreams	Letter to Editor	Spotted Cats	Water Picture	President's Niece	Animal Shelter	Fastest Human	Soft and Loud	Baseball Reg.	Sports.
Block 1 (Academic)										
RSC										
Beta	.364	.107	.208	.087	.098	.162	.306	.156	.112	.119
t	2.66**	.710	1.49*	.623	.683	1.11	2.05*	1.04	.879	.886
Basic Lit. Skills										
Beta	.342	.383	.230	.283	.400	.343	.177	.279	.543	.475
t	2.55**	2.61*	1.70	2.01	2.77**	2.33*	1.19	1.84	4.25**	3.53**
Adj. R^2 for Academic	24.7%**	11.8%*	11.4%*	1.4%	12.3%*	11.3%*	10.3%*	7.1%	25%**	22.4%**
Block 2 (BK)										
Total TF										
Beta	.206	.052	.087	.236	.214	.052	-.003	.111	.313	-.06
t	1.40	.289	.536*	1.60	1.25	.303	-.021	.665	2.08*	-.41
Individual TF										
Beta	-.055	.128	.357	.318	.001	.126	.071	.017	.011	.239
t	-.370	.720	2.13**	2.20*	.005	.744	.448	.104	.073	1.70
Adj. R^2 for BK			12.2%**	16.8%*	0.5%				7.9%*	1.6%
Total Adj. R^2 for Block 1 and Block 2 variables	24.7%**	11.8%	23.6%**	18.2%*	12.8%*	11.3%	10.3%	7.1%	31.9%**	24.1%**

Note: RSC = reading self-concept. TF = topic familiarity. BK = background knowledge.
*p < .05, **p < .01

Animal Shelter passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 3.87, $p < .05$, and accounted for 11.3% of the variance in predicting reading comprehension performance, with Basic Literacy Skills being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Fastest Human passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 3.59, $p < .05$, and accounted for 10.3% of the variance in predicting reading comprehension performance, with Reading Self-concept being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Soft and Loud passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills, and did not contribute significantly to reading comprehension on this passage. The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Baseball Registration passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 38.52, $p < .01$, and accounted for 25% of the variance in predicting reading comprehension performance, with Basic Literacy Skills being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity. This analysis was statistically significant, F (4, 41) = 6.27, $p < .05$, Adj. $R^2 = 0.079$, and accounted for 7.9% of the variance in predicting reading comprehension performance for this passage (see Table 4).

Sportsmanship passage. The first block of variables included academic variables, Reading Self-concept and Basic Literacy Skills. This analysis was statistically significant, F (2, 43) = 7.50, $p < .01$, and accounted for 22.4% of the variance in predicting reading comprehension performance, with Basic Literacy Skills being a significant contributor (see Table 4). The second block of variables added to the analysis included background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, and did not contribute significantly to reading comprehension performance on this passage.

Overall findings of hierarchical regression analyses. Findings indicated that academic variables, Reading Self-concept and Basic Literacy Skills, were found to be significant contributors to reading comprehension performance for eight of ten CST passages (Bird of Dreams, Letter to Editor, Spotted Cats, President's Niece, Animal Shelter, Fastest Human, Baseball Registration, and Sportsmanship). Background knowledge variables, Total Topic Familiarity and Individual Topic Familiarity, were found to be significant contributors to reading comprehension performance for three of ten CST passages (Spotted Cats, Water Picture, and Baseball Registration).

CHAPTER 4
Discussion

This study examined the relationship between background knowledge and reading comprehension performance on the CST for sixth, seventh, and eighth-grade ethnic minority students from low-income backgrounds. Other predictor variables were also examined including Academic Achievement, Basic Literacy Skills, Reading Self-concept, Gender, Race and Ethnicity, and Language Background. Background knowledge was examined as a variable of perceived general knowledge (Total Topic Familiarity) and topic-specific knowledge (Individual Topic Familiarity). Analyses revealed that, for passages on the CST, academic variables, specifically Basic Literacy Skills and Reading Self-concept, significantly contributed to reading comprehension performance. Background knowledge variables, both Total Topic Familiarity and Individual Topic Familiarity, also significantly contributed to reading comprehension performance on three of the CST passages. Limitations of the study were also identified as well as prospective areas of research.

What Did Participants Know?

Trends observed in background knowledge of participants. When reviewing the findings for both background knowledge measures, trends were observed regarding familiarity for certain passages. Some differences existed regarding which passages were considered the least or most familiar, depending on rankings and ratings. However, certain passages were consistently ranked or rated as the least or most familiar.

Passages that were found least familiar. When findings from both background knowledge measures were reviewed, analyses of rankings showed that participants as a whole were much less familiar with the following passages: Bird of Dreams, President's Niece, and Fastest Human. Analyses of ratings showed that participants as a whole were much less familiar with the following passages: Bird of Dreams, Water Picture, and President's Niece. On both measures, Birds of Dreams and President's Niece were found to be two of the passages that participants considered least familiar. These results were expected for Bird of Dreams and President's Niece since topics discussed in these passages may be considered more obscure and dependent on historical knowledge. Bird of Dreams is a poem about a mythological creature and President's Niece is a biographical narrative about the niece of a former president during the 19th century.

Fastest Human was ranked one of the least familiar passages and Water Picture was rated one of the least familiar passages. These results were expected for Fastest Human since the topic discussed in this passage is strongly dependent on historical knowledge; this passage depicts a childhood memory of Jesse Owens, a 1936 track and field Olympian, and his brother. Results for Water Picture, however, were unexpected because this passage is a poem about observations made of reflections in a pond at the park. Information found in this passage could be considered more common knowledge. Teacher feedback regarding this observation included that this passage used abstract language that was difficult to comprehend. Teachers also reported that this passage did not have much relevance to participants in the study since they did not have many parks in their community and were not likely to share the experience of strolling by a pond.

Passages that were found most familiar. When findings from both background knowledge measures were reviewed, analyses of rankings showed that participants as a whole were much more familiar with the following passages: Letter to the Editor, Spotted Cats, Water

Picture, and Sportsmanship. Analyses of ratings showed that participants as a whole were much more familiar with the following passages: Spotted Cats, Animal Shelter, Sportsmanship, and Baseball Registration. On both measures, Spotted Cats and Sportsmanship were consistently found to be two of the passages that participants considered most familiar. These results were expected for Sportsmanship, as this passage discusses a topic that may be considered common knowledge. Sportsmanship discusses the advantages and disadvantages of teaching sportsmanship in school, which many participants may have gained knowledge about through their school experiences. Results for Spotted Cats, however, were unexpected because this passage is a factual account of animals that belong to the Big Cat family, such as cheetahs and leopards. Information found in this passage could be considered more obscure and dependent on specialized knowledge. Teacher feedback regarding this observation included that many of the participants watched educational television programming related to animals, specifically shows seen on The Discovery Channel and Animal Planet channels. This is an important observation as it suggests that background knowledge for this specific topic may have increased reading comprehension performance on items related to this passage even though it was a passage that contained specialized knowledge not commonly held by middle-school students.

Letter to Editor and Water Picture were both ranked as one of the most familiar passages and Animal Shelter and Baseball Registration were rated as one of the most familiar passages. These results were expected for all of these passages since topics discussed in these passages may be considered more common knowledge, especially to the population being studied. Letter to Editor discusses the advantages and disadvantages of watching movies in a theater or at home on your television, Water Picture describes scenery at a park, Animal Shelter includes information about volunteering at an animal shelter, and Baseball Registration includes information about registering for Little League.

As mentioned before, some differences were observed regarding which passages were found least and most familiar depending on the measure being used. Explanations regarding why these differences may have occurred, as well as correlational findings between measures per passage, are discussed in the next section.

Comparing results from background knowledge measures. The use of two background knowledge measures allowed for extended analysis of the relationship between background knowledge and reading comprehension performance on the CST. Analyses showed significant positive correlations between measures for three out of the ten passages. This indicates that one or both measures lacked accuracy and/or robustness in measuring topic familiarity for passages on the CST.

The predictive nature of each measure varied due to the nature of the tasks participants were asked to perform. In the first measure, participants were asked to rank brief descriptions of passages on familiarity. This task forced participants to assign each passage a unique rank. This task assumed that (a) participants had varied levels of background knowledge for the passage topics and, (b) participants had high levels of background knowledge for at least a few topics. If this was not the case, participants' ranks may have varied significantly with regard to accuracy. On the second measure, however, participants were asked to rate the passages using a four-point Likert-type scale, which allowed them the freedom to rate each passage using a value of their choice.

Because rankings were based on brief descriptions of the passages, participants had much less information to judge familiarity with. The advantage of this was that participants may have ranked passages based on a more *true* version of background knowledge, one that is not influenced by readability or length of the passage, as may have occurred in the rating task. Because the rating task was done while taking the CST, the length of the task duration was longer than the ranking task and fatigue may have influenced the rating of the tasks, especially those that occurred towards the end of the test.

Based on group medians for the ranking measure and group means for the rating measures (see Table 2), passages were examined for rank order differences between the two tasks. Observations of note include the following: Animal Shelter, Fastest Human, and Baseball Registration were ranked much lower on familiarity using the ranking measure than the rating scale, while Water Picture and Sportsmanship were ranked much higher on familiarity during the ranking measure than the rating scale. Again, these changes may have been due to participant fatigue, readability of passages, amount of information given for ranking and rating tasks, or other unknown factors.

Teacher feedback regarding why some passages were ranked and rated differently included the fact that some passages were more difficult to read because of abstract language and, therefore, may have been rated lower than originally ranked due to readability and comprehension factors. Also, teachers commented on how sixth-graders especially were more susceptible to fatigue and that reading comprehension performance may have declined considerably on items of the CST that occurred in the latter half of the test.

Consistency between background knowledge measures. The relationship between background knowledge and reading comprehension was examined by using correlational analyses. Though an overall score was not available for the Topic Familiarity Ranking Measure, an overall score from the Topic Familiarity Rating Scale was available for analysis. The Total Topic Familiarity score showed positive (significant and non-significant) associations with reading comprehension performance overall and for seventh and eighth-graders combined. However, only two passages, President's Niece and Water Picture, showed correlations between background knowledge and reading comprehension that were significant and higher than 0.3 (see Table 2). Previous studies have found positive significant associations (> 0.3) between background knowledge and reading comprehension (Anderson & Pearson, 1984; Anderson, et al., 1977; Bransford & Johnson, 1972). Significant positive correlations between Total Topic Familiarity and Reading Comprehension on the CST suggest that this scale shows potential concurrent validity between background knowledge and reading comprehension performance. However, because significant findings were shown for only two of the CST passages, the measure shows inconsistency in its ability to measure background knowledge and predict reading comprehension performance.

How Did Participants Perform on the CST and Why?

Findings for overall CST performance. After reviewing findings regarding participant reading comprehension performance on the CST, it was apparent that certain predictor variables did not significantly contribute to the variance in overall reading comprehension performance on the CST. The variables included GPA and all demographic variables (Gender, Race and Ethnicity, and Language Background) as seen in Table 3.

For variables in the academic block, both Reading Self-concept and Basic Literacy Skills significantly accounted for variance in CST reading comprehension, however, GPA did not show a significant influence. Teacher observations regarding these findings suggested that many classes at the school offered ample opportunities for students to improve low grades (e.g., retaking exams, turning in extra-credit assignments, etc.) and, therefore, GPA may not be an accurate measure of academic achievement. Basic Literacy Skills, however, seemed to be a better measure of academic achievement, specifically in the area of Language Arts. Reading Self-concept represents participant's confidence level as well as their interest level in reading. It is important to note that while academic achievement, as measured by Basic Literacy Skills, was found to significantly influence reading comprehension performance, self-confidence and interest in reading, as measured by Reading Self-concept, also had a significant influence. This finding suggests that basic reading skills as well as students' comfort level, confidence, and interest in the topics they are reading and learning about may contribute greatly to students' comprehension and should therefore be considered when developing reading comprehension instruction and when choosing Language Arts curriculum.

For variables in the demographic block, Gender, Race and Ethnicity, and Language Background were not found to be significant contributors to CST reading comprehension performance. Though it was expected that differences would be found between racial and ethnic groups regarding reading comprehension performance, no significant differences were observed. For Race and Ethnicity, this finding may be a result of a small sample that was not representative of the national population (a much smaller distribution of non-Hispanic White students and higher distribution of Hispanic White students). It could also be attributed to the influence of socio-economic status being stronger than race and ethnicity on reading comprehension performance. According to the 2007 National Assessment for Education Progress (NAEP) findings, eighth-graders that are eligible for free and reduced-price lunches score considerably lower (24 points) in reading when compared to peers of higher socio-economic status.

Analyses showed that sixth-graders scored significantly lower on the CST than seventh and eighth-graders. These findings, as well as teacher reports regarding the difficulty that sixth-graders had with understanding some of the CST passages, more susceptibility for fatigue, and administration of the CST at mid-year as opposed to the end of sixth grade confirmed that the results of sixth-grade participants should be interpreted with caution. Because of this, analyses examining the relationship between predictor variables and reading comprehension performance for each passage used data from seventh and eighth-grade participants only. Also, because demographic variables, in general, and GPA did not contribute significantly to reading comprehension performance on the CST, these variables were not included in analyses conducted for each passage.

Findings for reading comprehension performance per passage. Results showed that the majority of variance accounted for in reading comprehension performance could be attributed to academic variables, specifically Reading Self-concept and Basic Literacy Skills. Academic variables were found to be significant contributors to reading comprehension performance for eight of the ten passages, with Basic Literacy Skills contributing significantly to reading comprehension performance in six of those passages. This finding suggests that basic reading skills as well as confidence in reading play an important role in standardized reading comprehension test performance.

Background knowledge, both Total Topic Familiarity and Individual Topic Familiarity, were found to account for additional variance in reading comprehension performance, beyond the effect of academic variables, on three of the CST passages (Spotted Cats, Water Picture, and Baseball Registration). Though significant contributions were identified, background knowledge was not found to be a consistently significant influence on reading comprehension performance across all CST passages. It is interesting to consider, however, that passages that showed a significant association between background knowledge and reading comprehension were those that discussed specialized knowledge of a topic or included more obscure and sophisticated language than other passages. One could conclude that the effect of background knowledge is more influential in these instances; this observation is one that should definitely be explored in future research.

Limitations of the Current Study

Though results from the current study did yield significant positive associations between background knowledge and reading comprehension performance on CST passages, the size of the sample and the robustness and accuracy of the background knowledge measures may have limited the findings of the study. The small sample size made it difficult to compare racial and ethnic groups, specifically because the representation of certain groups was not representative of the national student population of the United States or the state population of California. For example, Non-Hispanic Whites were underrepresented while Hispanic Whites were overrepresented. Also, the lack of socio-economic diversity of the sample may have limited the effects of race and ethnicity from becoming apparent. It is recommended that future studies employ a larger, more socio-economically diverse and proportionally representative sample in order to better investigate the effects of race and ethnicity on background knowledge and reading comprehension performance.

The accuracy of the Topic Familiarity Ranking Measure was difficult to establish and limited by certain assumptions that did not apply to the population of study. The Topic Familiarity Rating Measure was more accurate in its ability to measure background knowledge as a whole though future research should focus on refining these measures to ensure accurate and valid assessment of background knowledge. A direct measure of general knowledge on targeted topics should also be developed to better assess the effect of breadth of knowledge on standardized reading comprehension test performance.

Conclusions

This study aimed to investigate the relationship of background knowledge and reading comprehension performance on the CST for ethnic minority middle school children from low-income backgrounds. The first hypothesis of the study was that topic familiarity, as measured by the background knowledge measures, would show a positive association with reading comprehension ability per passage and overall on the CST. Results showed that this hypothesis was not confirmed, as it was dependent on the grade level of participants being examined and associations varied by passage. Significant positive associations between background knowledge and reading comprehension were only found in 30% of the passages. It seems that the difficulty of passages and items of the CST, as well as the administration of the test during mid-year, may have influenced the outcome of reading comprehension performance significantly, therefore diminishing any positive association that may have existed between

background knowledge and reading comprehension performance for sixth-graders. This finding suggests that a threshold may be present with regard to the effects of background knowledge and reading passage difficulty. However, findings that examined seventh and eighth-grade participants confirmed the prediction stated in the first hypothesis for some of the passages.

The second hypothesis of the study was the prediction that background knowledge will independently predict reading comprehension ability independent of academic achievement. This hypothesis was confirmed but was also dependent on the grade level of participants being examined and was only supported in three of the passages (30%) for participants. Further research should investigate whether the positive effect of background knowledge on reading comprehension performance would be more influential with the use of a larger sample size, better measures of topical knowledge, and/or the use of a range of topics that might elicit a wider range of topical knowledge scores.

Educational implications. Instruction on reading comprehension in the public schools has undergone much change over the last three decades. The dichotomization of reading into stages of *learning to read* and *reading to learn* combined with the need to assess the act of reading comprehension in a standardized manner has created a climate where reading instruction is largely skill-based and strategy-driven. Reading instruction seems to have become more isolated than before and divergent from the true purpose of reading, which is to immerse oneself in the enjoyable act of acquiring knowledge and new perspectives (Pearson & Cervetti, in press). According to Pearson and Fielding (1991), the overuse of strategies in learning to read and understand what we read can become so complicated and detached from the true goal of reading that it can turn into an "introspective nightmare" (p. 251).

Teaching children to read, especially those children from disadvantaged backgrounds with limited opportunities to learn outside the home, should be an experience that incorporates the acquisition of world knowledge from the start and, of course, include instruction in a variety of skills and strategies to help the process along. However, reading should not be deconstructed to the point where a child can no longer see the purpose of reading or experience the joy of learning new information and gaining insight from another's view of the world. In our efforts to boost reading comprehension among all school children, we have become sidetracked with process-oriented approaches and neglected to give children what they truly crave and need, knowledge and perspectives about the world around them, which motivate and delight their growing minds.

The relationship between background knowledge and reading comprehension has been long established (Anderson & Pearson, 1984; Anderson, Reynolds, Schallert & Goetz, 1977; Bransford & Johnson, 1972). It is as or more important than the knowledge of words and comprehension strategies in the process of reading. In research examining the role of basic reading processes and the role of relevant background knowledge, both are shown to make unique contributions to reading comprehension (Haenggi & Perfetti, 1994).

This study examined the relationship between background knowledge and reading comprehension within the context of standardized tests created to assess students' ability to understand text. As predicted, findings indicated that background knowledge does have a positive effect on reading comprehension performance for the CST. The extent of how much of an influence background knowledge has is still unclear. The impact of other predictor variables such as Basic Literacy Skills and Reading Self-concept have also been shown to have positive

effects and should definitely continue to be examined independently and together to determine their role in reading comprehension. The question of whether or not what is being tested is relevant to what is being taught in the public school classroom still remains unanswered. However, results from the study support the idea that increasing background knowledge should be a focal point of instructional language arts activities that occur during the school day, and not just a benefit derived from enrichment activities that families of middle and upper-income backgrounds can participate in. For children from disadvantaged backgrounds, what is being taught in the schools may be the sole opportunity available to not only learn the process of reading but to joyfully engage in what can be a life-long journey of acquiring new knowledge and gaining new insights about the world.

References

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. Guthrie (Ed.), *Comprehension and teaching: Research reviews* (pp. 77-117). Newark, DE: International Reading Association.

Anderson, R. C., & Pearson, P. D. (1984). A schema-thematic view of basic processes in reading comprehension. In P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research* (pp. 255-291). New York, NY: Longman.

Anderson, R. C., Reynolds, R. E., Schallert, D. L., & Goetz, E. T. (1977). Frameworks for comprehending discourse. *American Educational Research Journal, 14*, 367-381. Retrieved from www.jstor.org/stable/1162827

Baker, L., & Anderson, R. I. (1982). Effects of inconsistent information on text processing: Evidence for comprehension monitoring. *Reading Research Quarterly*, *17*, 281-294. Retrieved from www.jstor.org/stable/747487

Bransford, J. D., & Johnson, M. K. (1972). Contextual prerequisites for understanding: Some investigations for comprehension and recall. *Journal of Verbal Learning and Verbal Behavior, 11*, 717-726. Retrieved from http://memlab0.eng.yale.edu/PDFs/1972_Bransford_Johnson_JVLVB.pdf

Brown, A. L., Palincsar, A. S., & Armbruster, B. B. (1984). Instructing comprehension-fostering activities in interactive learning situations. In H. Mandl, N. L. Stein, and T. Trabasso (Eds.), *Learning and Comprehension of Text* (pp. 255-286). Mahwah, NJ: Lawrence Erlbaum Associates.

California Department of Education. (2008). *California Standards Test*. Sacramento, CA.

Chall, J. S., Jacobs, V. A., & Baldwin, L. E. (1990). *The reading crisis: Why poor children fall behind*. Cambridge, MA: Harvard University Press.

Cunningham, A., & Stanovich, K. (2003). Reading can make you smarter. *Principal, 83*, 34-39. Retrieved from http://gse.berkeley.edu/faculty/aecunningham/Readingcanmakeyousmarter!.pdf

Gambrell, L. B., & Bales, R. J. (1986). Mental imagery and the comprehension-monitoring performance of fourth and fifth-grade poor readers. *Reading Research Quarterly, 21*, 454-464. doi:10.2307/747616.

Haenggi, D., & Perfetti, C. A. (1994). Processing components of college level reading comprehension. *Discourse Processes*, 17, 83-104. doi:10.1080/01638539409544860.

Hart, B., & Risley, R. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes.

Heath, S. B. (1986). Sociocultural contexts of language development. In California State Department of Education Bilingual Education Office, *Beyond language: Social and cultural factors in schooling language minority students* (pp. 143-186). Los Angeles, CA: Evaluation, Dissemination, and Assessment Center, California State University.

Hirsch, Jr., E. D. (1988). Cultural literacy: *What every American needs to know*. New York, NY: Houghton Mifflin.

Hirsch, Jr., E. D. (2006). *The knowledge deficit: Closing the shocking education gap for American children*. New York, NY: Houghton Mifflin.

Jencks, C., & Phillips, M. (1998). *The Black-White test score gap*. Washington, D.C.: Brookings Institution.

Johnston, P. H. (1983). *Reading comprehension assessment: A cognitive basis*. Newark, DE: International Reading Association.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first to fourth grades. *Journal of Educational Psychology, 80*, 437-447. Retrieved from http://people.uncw.edu/kozloffm/learningtreadandwrite.pdf

Kame'enui, E. J., Carnine, D. W., & Freshi, R. (1982). Effects of text construction and instructional procedures for teaching word meanings on comprehension of contrived passages. *Reading Research Quarterly, 17*, 367-388. Retrieved from jlr.sagepub.com/content/15/1/3.full.pdf

Lee, J. (2006). *Tracking achievement gaps and assessing the impact of NCLB on the gaps: An in-depth look into national and state reading and math outcome trends*. Cambridge, MA: The Civil Rights Project at Harvard University.

Magnson, K. A., & Duncan, G. J. (2006). The Role of family socioeconomic resources in the Black-White test Score gap among young children. *Developmental Review*, *26*, 365-399. doi:10.1016/j.dr.2006.06.004.

Marks, C. B., Doctorow, M. J., & Wittrock, M. C. (1974). Word frequency and reading comprehension. *Journal of Educational Research, 67*, 259-262. Retrieved from http://www.jstor.org/openurl?volume=67&date=1974&spage=259&issn=00220671&-issue=6

Marzano, R. J. (2004). *Building background knowledge for academic achievement*. Alexandria, VA: ASCD.

National Center for Education Statistics. (2007) About the nation's report card. Retrieved from http://nationsreportcard.gov/about_nrc.asp

National Early Literacy Panel (2008). *Developing early literacy: Report of the National Early Literacy Panel*. Washington D.C.: National Institute for Literacy.

No Child Left Behind Act of 2001, 20 U.S.C. § 6319 (2008).

Neuman, S. B. (2010). Sparks fade, knowledge fades: The National Early Literacy Panel's report lacks staying power. *American Educator*, 14-17, 39. Retrieved from http://www.aft.org/pdfs/americaneducator/fall2010/Neuman.pdf

Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.

Obiakor, C. E., & Utley, F. E. (1995, July). *Scientific and methodological concerns in research: Perspectives for multi-cultural learners*. Paper presented at the Office of Special Education Programs Project Directors' Conference. Washington, DC.

Otero, J., & Kintsch, W. (1992). Failures to detect contradictions in a text: What readers believe versus what they read. *Psychological Science, 3*, 229-235. doi: 10.1111/j.1467-9280.1992.tb00034.x.

Paris, S. G., Cross, D. R., & Lipson, M. Y. (1984). Informed strategies for learning: A program to improve children's reading awareness and comprehension. *Journal of Educational Psychology, 76*, 1239-1252. Retrieved from ldx.sagepub.com/content/23/5/270.full.pdf

Pearson, P. D. (2001). Life in the radical middle: A personal apology for a balanced view of reading. In R. Flippo (Ed.), *Reading researchers in search of common ground* (pp. 78-83). Newark, DE: International Reading Association.

Pearson, P. D., & Cervetti, G. (in Press). Literacy education: Should the focus be on 'reading to learn' or on 'learning to read'? In C. J. Russo & A. J. Eackle (Eds.), *Curriculum and instruction: Debating issues in American education*. New York, NY: Sage.

Pearson, P. D., & Fielding, L. (1991). Comprehension instruction. In R. Barr, M. L. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 815-860). New York, NY: Longman.

RAND Reading Study Group. (2002). *Reading for understanding: Towards an R&D program in reading comprehension*. Retrieved from http://www.rand.org/multi/achievementforall/reading/readreport.html

Ravitch, D. (2010). *The death and life of the great American school system*. New York, NY: Basic Books.

Rushton, J. P., & Jensen, A. R. (2005). Thirty years of research on race differences in cognitive ability. *Psychology, Public Policy and Law*, *11*(2), 235-294. doi:10.1037/1076-8971.11.2.235

Smith, J. R., Brooks-Gunn, J., & Klebanov, P. K. (1997). Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G.J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp. 132-189). New York, NY: Russell Sage Foundation.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, *21*, 360-407. Retrieved from http://www.psychologytoday.com/files/u81/Stanovich__1986_.pdf

Taconis, R., Ferguson-Hessler, M., & Broekkamp, H. (2001). Teaching science problem solving: An overview of experimental work. *Journal of Research in Science Teaching*, *38*, 442-468. Retrieved from onlinelibrary.wiley.com/doi/10.1002/tea.1013/pdf

Thernstrom, A., & Thernstrom, S. (2003). *No excuses: Closing the racial gap in learning*. New York, NY: Simon and Schuster.

U.S. Census Bureau. (2010). *Table 715: Families below poverty level and below 125 percent of poverty by race and Hispanic origin 1980 to 2009*. Retrieved from http://www.census.gov/compendia/statab/2012/tables/12s0715.pdf

U. S. Department of Education, National Commission on Excellence for Education. (1983). *A nation at risk: The imperative for educational reform*.

Visone, J. D. (2010). Science or reading: What is being measured by standardized tests. *American Secondary Education, 39*, 95-112. Retrieved from http://www.highbeam.com/doc/1P3-2198903721.html

Willingham, D. (2009). Reading is not a skill: And why this is a problem for the draft national standards, *The Washington Post*. Retrieved from http://voices.washingtonpost.com/answer-sheet/daniel-willingham/willingham-reading-is-not-a-sk.html

Appendix A

<u>Demographic Background Survey</u>

Participant #: _____

Class: _____

Please answer the following questions about yourself.

How old are you? _____

What grade are you in? _____

What is your Ethnicity/ Race?

___ African American/ Black
___ Asian
___ Latino/ Hispanic
___ White/ European-American
___ Filipino
___ Arab/ Middle Eastern
___ American Indian
___ Other _____

What languages do you speak besides English? _____

What language do you feel most comfortable speaking in? _____

What is your overall GPA? _____

How often are you able to understand the texts that you are asked to read in your classes? (Please circle a number below that best answers this question.)

1	2	3	4
Never	Sometimes	Most of the time	All of the time

Topic Familiarity Ranking Measure

PARTICIPANT #: _____   GRADE: _____

CLASS: _____

Below you will see summaries of ten passages you will be reading later this week. We would like you to read the summaries and rank them on how familiar the topics discussed in the summaries are to you, using the numbers 1-10. You will use a 1 to rank the passage summary you are least familiar (know only a little or nothing about) and a 10 to rank the passage summary you are most familiar with (know the most about). Remember, you are not ranking topics on how interesting they may be to you but, instead, on how much you think you know about the topic described in the summary.

When you rate the passages, think of these questions:

1. Have you run across this topic before?
2. Are you familiar with some of the words used in the passage summary?
3. Have you read other texts about this topic before?

You will rank the summaries in two stages. In the first stage, you will divide the summaries into two groups. Five summaries will be grouped into the Least Familiar group and the other five summaries will be grouped into the Most Familiar group. You can place each group into the labeled envelopes provided.

In the second stage, you will take out the summaries from the Least Familiar envelope and rank them from 1-5, with 1 being the summary that is least familiar to you and 5 being the summary that is most familiar to you in that group. Then you will put these summaries back into the envelope labeled Least Familiar. Next you will take out the summaries from the Most Familiar group and rank these summaries from 6-10, with 6 being the least familiar summary in the group and 10 being the most familiar summary. Then you will put these summaries back into the envelope labeled Most Familiar.

____   <u>Passage A</u>
This reading passage is a poem about a Phoenix, a Greek mythological creature. It includes descriptive language about the Phoenix such as the phrases: "flaming pyre", "ashen pile", and "feathers luminous and bright" in a lyrical writing style.

____   <u>Passage B</u>
This reading passage is an editorial piece about whether or not a large movie theatre should be built in a local shopping center. It includes information about movie theatres and video rental stores. It also discusses the advantages of watching a movie in a theatre or at home on your television.

____   <u>Passage C</u>
This reading passage is an informational text on members of the "Big Cat" family. It includes information on leopards, jaguars, and cheetahs. It also discusses details about each type of "Big Cat" and the different parts of the world the animals live in.

____   <u>Passage D</u>
This reading passage is a poem about a pond in a park. It includes descriptive information and language about the different types of things you may see on a typical day in a park and how these things would look reflected on the water.

____   <u>Passage E</u>
This reading passage is a story about the niece of a former president. It includes historical information about what it was like to live in the White House and what types of social activities occurred in the White House during the mid-19th century.

_____ <u>Passage F</u>
This reading passage contains three separate documents. The first is a descriptive text about a local animal shelter. It includes information about volunteering at the shelter and the types of jobs that volunteers can do at the shelter such as being a Dog Nuzzler, Cat Snuggler, or Kennel Aide. The second and third documents are forms used when applying to be a volunteer at the shelter. They require personal information to be filled in.

_____ <u>Passage G</u>
This reading passage is a story about Quincy and Jesse Owens, brothers that lived in the 20th century. It includes a narrative about children racing each other and about Jesse being the fastest boy. It is based on a former African-American Olympian who won four medals at the Olympic Games in Berlin, Germany.

_____ <u>Passage H</u>
This reading passage is an informational text about pianos and other stringed instruments. It discusses historical and factual knowledge about how stringed instruments like the piano, violin, harp, hammer dulcimer, and harpsichord work.

_____ <u>Passage I</u>
This reading passage is an opinion piece that argues for teaching good sportsmanship to children in school. It includes information on competitive activities, playing fair, following rules, getting frustrated with others, and working together as a team.

_____ <u>Passage J</u>
This reading passage contains two documents. The first is a form that includes information about how to register to be on a baseball team. It discusses who can play in the baseball league, how old they have to be, when the tryouts are, and when you have to turn in the registration form. The second document is a flyer advertising a sale on baseball apparel from a local store.

Topic Familiarity Rating Scale

A. *Bird of Dreams*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

B. *Letter to the Editor*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

C. *Spotted Cats*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

D. *Water Picture*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

E. *More Than a Niece*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

F. *The Animal Shelter of Sacramento County*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

G. *The World's Fastest Human*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

H. *Soft and Loud*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

I. *Should Sportsmanship Be Taught in School?*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar

J. *Registration Form for League Baseball*

How familiar are you with the information in the passage you just read?

1	2	3	4
Not familiar at all	A little familiar	Somewhat familiar	Very familiar