



Untapped Cultural Support: The Influence of Culturally Bound Prior Knowledge on Comprehension Performance

Ruanda Garth-McCullough, Ph.D.

Loyola University, Chicago, IL

Abstract

By analyzing the prior knowledge of African American students, this study explored the relationship between cultural orientation of literature and reading comprehension to determine its' effect on low, mid, and high level readers. Over one hundred 8th grade students from four different public schools read short stories from three different cultural orientations. Their reading comprehension performance was analyzed to determine the role that culturally-bound prior knowledge plays in the comprehension process for low, medium, and high performing students. To measure the effects of cultural orientation of texts, prior achievement, and prior knowledge on the students' reading comprehension performance, the study utilized the Rasch model and ANOVA. The data revealed a high level of culturally-bound prior knowledge supports students' reading comprehension. Cultural support was especially important to readers at the mid range achievement level.

The average African American or Latino student achieves at the same level as the average white student in the lowest quartile (Weiss, 2003). Underperformance of African American students has been debated and analyzed from many perspectives, and the issues remain unsettled. Arguments centered on African Americans' achievement often blame students, their families, communities, and socioeconomic factors for this assumed lack of ability, interest, and motivation. Studies frequently cite underperformance as the problem when in fact it is only one of many symptoms (Burns, Keyes, & Kusimo, 2005; Gay, 2000; Ladson-Billings, 2006).

In order to lower obstacles to achievement, educators must better identify the learning process variables in the classroom that either interfere with or promote students' performance. Social and linguistic experiences are particularly fruitful processes because they influence students' access to and comprehension of curricula (Cazden, John, & Hymes, 1972; Gee, 1989, 2004; McCollin & O'Shea, 2005; Wertsch, 1991). Investigating within-group variability in literacy achievement, often masked in performance averages across ethnic groups, could bring us closer to practical information on the social experiences and linguistic background that affect achievement (Gay, 2000). Effective use of the shared experiences that students within the same ethnic groups bring to the classroom can be used as a basis for efficient adaptations to curriculum and instructional strategies in ways that can enhance performance.

By analyzing the prior knowledge of an economically and academically diverse group of African American students, this study explores the relation between cultural orientation of literature and student reading comprehension among low, mid, and high level readers. In literacy instruction, the content of the texts often conveys cultural orientation through language, values, practices, beliefs, and styles that are specific to a cultural group or subgroup. The present study explores this relationship between the cultural schema embedded in literary narratives and reading comprehension performance. In particular, the study analyzes aspects of reading comprehension to determine how culture affects literacy acquisition during adolescence. Although prior research investigated national or international cross-cultural samples (Steffensen, Joeg-Dev, & Andersen, 1979), this study focuses on within-group differences in an African American sample. This approach provides an opportunity to highlight distinctions between students at various achievement levels. Ultimately, the findings further our understanding of what role social and cultural factors play in cognitive processes.

This research extends the work conducted in the 1970s and 1980s by the Center for the Study of Reading at the University of Illinois at Urbana-Champaign on prior knowledge, schema, and reading comprehension. It does so first by including multicultural literature and using authentic texts with a racial subgroup (Freebody & Anderson, 1981; Hall & Guthrie, 1979; Johnston & Pearson, 1982; Linn, Levine, & Hastings, 1980; Pearson & Raphael, 1989; Pearson, Roehler, Dole, & Duffy, 1999; Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1981). This study also extends the Center's work by using a classroom setting and typical texts as opposed to the more "bizarre" or "ambiguous" texts used in the laboratory studies (Carver, 1992; McVee, Dunsmore, & Gavelek, 2005; Sadoski, Paivio, & Goetz, 1991). Viewing schemas as tools that are embodied in sociocultural context in ways that mediate students' understanding and learning, this investigation of culturally bound prior

knowledge is defined as prior knowledge that is derived from social practices of a particular community group, recognizing the connection between cognitive science and situated practices (McVee et al., 2005; Wertsch, 1991; Wertsch & Bivens, 1992).

In line with the more recent call made by McVee et al., (2005) to revisit schema theory, this research places social and cultural features in the foreground in the discussion of schema. Like the work of others (Alvarez, 1990; Anderson, 1994; Anderson & Pearson, 1984; Bransford, 1994; Norris & Phillips, 1987; Reynolds et al., 1981; Rumelhart, 1975; Tierney & Pearson, 1986), this research also views schema as a powerful tool that teacher and teacher educators use to understand students' reading comprehension. It extends earlier investigations that demonstrated the connection between prior knowledge and reading comprehension by identifying a sociocultural aspect in the relationship among a group of African American students in large urban public schools (Foertsch, 1989; Johnston, 1984; Johnston & Pearson, 1982; Maria & MacGinitie, 1981). The quantitative data provide the opportunity to explore whether the established relationship between prior knowledge and reading comprehension transfers to students' knowledge of the cultural information in the text. Similar to Anderson's (1994) study of black and white teenagers' perceptions of "sounding," this study also explores the students knowledge of the community-based practices embedded in the texts.

In an era dominated by the No Child Left Behind act, mid-performing students risk getting lost in the shuffle since high stakes testing frequently forces schools to focus resources on lower performing students. However, as this article suggests, given the improved performance of students when they interact with text based in a familiar cultural context, multicultural texts can be an effective tool in boosting literacy achievement for all students, including lower-income mid-performers. Such an approach may capitalize on the opportunities to enhance talent amongst students that are in jeopardy of being under-nurtured in the current educational climate.

Related Literature

To say that the American educational system was not constructed with African American experiences in mind would be a gross understatement. American schools, their academic activities, structures, and materials primarily reflect social, historical and cultural traditions of a white, middle-class mainstream. It has been argued that students whose experiences do not relate to the cultural norms reinforced in most American classrooms are at an academic disadvantage (Lane, 2006). The practices that require students to "check their bodies at the schoolroom door" have proven ineffective (Gee, 2004, p. 39).

Literacy instruction is a clear example of content that often conveys cultural orientation through language, values, meaning, beliefs, style rituals, and preference. Just like schools and classrooms, texts are culturally loaded (McVee et al., 2005). Frequently, the role that prior knowledge plays in text comprehension has received less attention than other strategies for improving comprehension. For example, Armbruster, Lehr, and Osborn's (2003) book, *Put Reading First: The Research Building Blocks for Teaching Children to Read* recommends six strategies grounded in science for improving text comprehension: monitoring comprehension; using graphic and semantic organizers; answering questions; generating questions; recognizing story structure; and summarizing. It only secondarily mentions using prior knowledge in the classroom as a means of supporting literacy. *Put Reading First* (2003) is listed on the National Reading Panel website, which was developed by the Center for the Improvement of Early Reading Achievement (CIERA) and funded by the National Institute for Literacy (NIFL) (Armbruster et al., 2003).

Previous research has identified sociocultural factors as influential in the processes, content, interactions and perceptions of the classroom (Banks, 1995a; Banks, 1995b; Pai & Adler, 1997; Ruddell, 1994; Ruddell, Ruddell, & Singer, 1994). Research in the areas of multicultural education, cognition, educational anthropology, and cultural psychology have also explored whether sociocultural factors influence various aspects of the educational process. Other studies demonstrate the importance of cultural synchronization, modeling, and relevance in learning situations (Allen & Boykin, 1992; Aoki, 1993; Au & Jordan, 1977; Banks & Banks, 1995; Boykin, 1984; Gay, 2000; Jordan Irvine, 1990; King, 1995; Ladson-Billings, 1994, 1995a, 1995b; Lee, 1992, 1993; Mehan, Lintz, Okamoto, & Wills, 1995; Minami & Ovando, 1995; Nieto, 1999; Pai & Adler, 1997; Pewewardy, 1994; Wyngaard, 1999; Yokota, 1998).

While related research offers theoretical support for incorporating students' cultural experiences into the classroom, there is a dearth of empirical studies examining the effects of using culturally relevant materials on student achievement (Howard, 2003; Ladson-Billings, 1995b). Casteel's (1997) study of seventh graders is one of the few and is closely aligned with the objectives and design of this current investigation. Casteel (1997) found that African American students' comprehension scores were higher when the students read passages from a basal that featured white protagonists rather than passages featuring African American characters. The students indicated that the passages depicting African Americans set the characters in a negative light and were boring, which was a likely shortcoming of the study design. The study also did not include an assessment of the cultural load of the text. Culture load refers to the "amount of cultural knowledge required but never explicitly explained in order for the learner to accurately comprehend the meanings

of a text” (Meyer, 2000, p. 230). This current study offers a more nuanced empirical approach to examining the effects of cultural knowledge and comprehension.

Reading comprehension offers an appropriate measurable outcome variable for this study because sociocultural influences are believed to affect the comprehension process (Foertsch, 1989; Ruddell et al., 1994). Traditional research on reading has often focused on the psychological processes of the individual. More recent research views comprehension as the construction of the meaning of written communication that results from an exchange of ideas between the interpreter and the content in a specific communicative context (Harris & Hodges, 1995). This process involves the social, cultural, and historical experiences of the reader with the information provided in the text. It is believed that when the intended message relates to readers’ experiences, they are better able to invoke background knowledge to construct the intended meaning. For this study, students’ prior knowledge of text content—specifically, culturally bound prior knowledge—is explored to assess its effect on comprehension.

In its most general form, the operating premise of this study is that culture influences knowledge, beliefs, and values, and that knowledge, beliefs, and values influence comprehension processes. If, when reading, students have access to tools that they develop in other sociocultural contexts, their comprehension will increase. In their reading of culturally relevant text, access to culturally bound prior knowledge should increase their comprehension performance because it will enable them to draw on their own experiences as a frame of reference for understanding the context and details of the story.

Theoretical Framework: The Tool Kit Analogy

The perspective of the current study is framed by Wertsch’s (1991) *Tool Kit Analogy*, which melds Vygotsky (Bakhtin, 1986; Todorov, 1998; Vygotsky, 1981, 1978; Wertsch, 1991) and Bakhtin’s (1986) research. From Wertsch’s (1991) view, prior knowledge and language are socially, historically, and culturally constructed tools that readers use to comprehend text. The tool kit analogy posits that individuals use the tools they have available to them, such as language and prior knowledge, to construct meaning and that tools, whether classified as technical (computer) or psychological (sign systems such as human language), play a role in mediating human action (Bakhtin, 1986; Todorov, 1998; Vygotsky, 1981, 1978; Wertsch, 1991). Wertsch (1991) drew heavily on Vygotsky’s (1978) theory, which asserted that individuals derive higher mental functioning (thinking, voluntary attention, and logical memory) from their social life. Vygotsky’s (1978) theory, which also declares that tools and signs mediate human action on social and individual planes, aids the

investigation of students' use of their sociocultural experiences to interpret and comprehend written text.

Bakhtin's theory of dialogicality provided the tool kit analogy a focus on the bi-directional relationship between the text and what readers bring with them while interacting with the text (Todorov, 1998). Wertsch's (1991) tool kit analogy contends that mediational means, such as prior knowledge, not only shape action in essential ways, but also "emerge in response to a wide range of social forces" (p. 34). Thus, students' sociocultural experiences outside of school impact the mediational means they have access to when involved in literacy tasks. The framework provided in the tool kit analogy assists educators in viewing what students bring from their general and cultural out-of-school experiences as *tools* rather than *deficits*. This in turn enhances learning outcomes. Wertsch's (1991) theory presents a set of concepts that provide a useful framework for this investigation of prior knowledge as a mediational tool that students employ during the reading comprehension process. Wertsch's discussion of mediational tools helps to further unpack the factors that could influence a student's reading comprehension.

Definitions of Key Concepts in the Study

Reading Comprehension

For the purposes of this study, comprehension is defined as, "a process in which the reader constructs meaning while, or after, interacting with text through the combination of prior knowledge and previous experience, information in text, the stance he or she takes in relationship to the text, and immediate, remembered, or anticipated social interactions and communication" (Ruddell, 1994, p. 415). This definition, based on schema, transactional, and sociocultural theoretical perspectives of the reading process, emphasizes reading comprehension as a complex process (Beck & McKeown, 1999). The complexity of this process involves interacting subprocesses that "require decoding accuracy and fluency, access to meanings of the vocabulary used and to background knowledge relevant to the content, and active engagement with the text" (Beck & McKeown, 1999, p. 197). The theoretical framework used in this study acknowledges the contextual and dialogical nature of reading comprehension as a meaning making activity. Readers' strategies, background, vocabulary, and metacognitive knowledge play a critical role in an interactive model of reading (Pearson & Raphael, 1989). According to Ruddell's (1994) definition, when readers can invoke their schemata, or conceptual frameworks, the meaning of the words they already know, their relationship with the text, and previous social interactions involving the word, they are able to understand or comprehend. The

argument driving this study is that when readers interact with literature that relates to their culture-specific experiences, their reading comprehension performance will improve. This improvement should occur because culturally relevant texts allow readers to access their cultural knowledge or culture-specific prior knowledge as a psychological tool to understand the intended meaning of the text.

Prior Knowledge

Information already available in the brain is an important factor in determining how readers process the information available in written text (Feeley, Wepner, & Willing, 1985). Anderson and Freebody (1981) demonstrated the importance of prior knowledge and previous experience in the reading process. For example, consider that a person who knows the word *jibed* is likely to have knowledge of sailing that enables him or her to construct meaning while reading the following sentence: *We jibed suddenly and the boom snapped across the cockpit.* Students who had no knowledge of sailing and were asked to read that sentence would be operating without sufficient prior knowledge and thus would be at a disadvantage.

Chiesi, Spilich, and Voss (1979) found that subjects with high knowledge about baseball recalled more significant information from a text about baseball than low-knowledge readers. This same effect was found with subjects from different religious backgrounds who read passages about particular religious ceremonies (Lipson, 1983). As the examples above indicate, the relationship between prior knowledge of content and comprehension has been positively correlated (Anderson & Freebody, 1981; Bransford & Johnson, 1972; Chiesi et al., 1979; Voss, Vesonder, & Spilich, 1980). Prior knowledge is an essential tool in a reader's quest for making meaning. Too often a student brings social and cultural knowledge, defined here as culturally bound prior knowledge, to the classroom that is often not reflected in their reading material. This same student is then assessed on his/her responses to texts that assume unfamiliar prior knowledge. The intent of this study is to examine the importance of investigating different types of prior knowledge such as culturally bound prior knowledge on students' comprehension performance.

Schema and Reading Comprehension

The basic premise of the schema theory of reading is that the reader's organized knowledge of the world provides much of the basis for comprehending, learning, and remembering the ideas in texts (Alvarez, 1990; Anderson, 1994; Bransford, 1994; Norris & Phillips, 1987; Reynolds et al., 1981; Rumelhart, 1975). Schema theorists understand that the act of reading is an interactive process involving simultaneous analysis at many different levels (i.e. written representations, words, meanings,

syntactic, pragmatic, and interpretive) (Alvarez, 1990; Bransford, 1994; Rumelhart, 1975). Schema theory assumes that as people read, they interpret what a segment of a text might mean by theorizing about what the print means and generating hypotheses in their minds (Anderson, 1994; Anderson & Pearson, 1984; Bransford, 1994; Tierney & Pearson, 1986). While prior knowledge is information that is available in the brain, schema theory focuses on how all of that knowledge is organized and used during the reading process. Both concepts are useful in this exploration since it is assumed that whether the prior knowledge is general or culturally bound, the schema operates in the same manner.

In the past, comprehension has been thought to consist of “aggregating the meaning of words to form the meanings of clauses, aggregating the meaning of clauses to form the meaning of sentences, aggregating the meanings of sentences to form the meanings of paragraphs, and so on” (Anderson, 1994, p. 43). Proponents of schema theory declare that words cannot be “added up” to explain the whole message. Instead, they view comprehension “as a matter of activating or constructing a schema that provides a coherent explanation of objects and events mentioned in a discourse” (Anderson, 1994, p. 473). According to this perspective, “knowledge does not consist simply of an unstructured set of individual facts, but rather of organized, interrelated structures or schemata” (Nagy & Herman, 1987, p. 28). The hypotheses that a person has about the meaning of the text is set in the direction of one of the reader’s possibility of meanings, often without the reader’s awareness that an alternative meaning is possible (Anderson, 1994).

According to this theory, a reader comprehends a message when she or he is able to bring to mind a schema that gives a good account of the objects and events described in the message (Anderson, 1994). When the mind is involved in meaningful learning, it organizes new materials into meaningful chunks or slots and relates them to existing cognitive structure in a way that they will become implanted (Ausubel, 1968). A classic study by Bransford and Johnson (1972) illustrated the significance of prior knowledge when they had subjects read paragraphs that were written so that most people would be unable to construct a schema that would account for the material. Except for subjects that were shown a drawing that represented the appropriate context, the subjects were unable to understand or recall most of the text. Schema theory argues that when readers are unable to invoke schema that fits the text, they find the passage incomprehensible.

Schema theory also acknowledges that more than one interpretation of a text is often possible. “The schema that will be brought to bear on a text depends upon the reader’s age, sex, race, religion, nationality, occupation—in short, it depends upon the reader’s culture” (Anderson, 2004, p. 597). The influence of a reader’s

background was illustrated in a study completed by Anderson, Reynolds, Schallert, & Goetz (1977), who asked subjects to read a somewhat ambiguous passage. Some readers understood the passage to be about an escaping convict; others believed the passage to be about a wrestling scene. The two groups of subjects (physical education and music education students) read this passage and responded to test items designed to measure their interpretation. According to the researchers, scores showed striking relationships to the subjects' background. Assigning different perspectives to readers has also been found to affect their comprehension (Pitchert & Anderson, 1977). These studies illustrate that schema provides a basis for interpreting information. Students with different majors have also been found to interpret text differently to an extent that affects their comprehension.

Readers' schema also affects their learning and remembering of information and ideas in the text (Anderson, 1994). Sometimes new information conflicts with the readers' prior knowledge and to resolve this conflict and accommodate the incongruent information, readers must attend to textual cues (Maria & MacGinitie, 1981). These findings point to the importance of a reader's access to psychological tools (e.g., prior knowledge and/or schema) in making sense of written text. If students from various backgrounds have different experiences or do not have equal access to the scripts and schemas assumed in the text, their comprehension, and thus achievement, might be affected. Although the relationship between schema theory and reading comprehension has been well documented, it is too often overlooked as a tool that can be used to support the reading achievement of disenfranchised students.

Method

This study uses a repeated measures design (Wang & Chyi, 2004) to investigate within-group variability of African American students of differing achievement levels. In fall 2001, 117 eighth-grade African American students from four public schools in a large mid-western city participated in this study. Students' reading comprehension scores from the 2000-2001 Iowa Test of Basic Skills (ITBS) test were used to identify their reading achievement level. Two of the sites were charter schools within the public school system: Gwendolyn Brooks and Audre Lorde charter schools (pseudonyms are used for all schools). Both charter schools classify more than 58% of their students as low income. More than 84% of the students at the non-charter schools, Pearl Cleage and Toni Morrison, were considered low income. All the schools served predominantly African American populations. The students in the classrooms where the study was presented were all African American. In

accordance with the Institutional Review Board (IRB) and the school system's site-based protocol, the principals and classroom teachers granted permission for their school to be included in the study before the study was presented to the students and their parents.

Participants

Approximately one-half of the 117 eighth-grade students involved in the study were male ($N = 62$). As noted, all study participants were African American, and all but one was born in the United States. Approximately 22% of the students' mothers and 30% of their fathers completed high school, and 19% of the mothers and 13% of the fathers had college degrees. Average household size was five. More than 93% of the students at Cleage and Morrison qualified for free lunch. This was higher than the percentage at the two charter schools: 61% at Brooks; 54% at Lorde qualified for free lunch.

Overall, the participants' instructional reading level ranged from 3.3 (third grade, third month) to 10.4 (tenth grade, fourth month), with a mean reading level at approximately the seventh grade (7.59) and a standard deviation of slightly more than one year (1.2). The high, medium, and low student achievement levels were determined by dividing the grade equivalent reading scores into thirds. This classification was made to determine whether students' reading ability influenced their use of the cultural information in the text. When the students were tested in the spring of their seventh grade year, 31% tested at 8.0 and higher, 37% tested between 7.0 and 7.8, 21% tested between 6.0 and 6.9, and 11% tested below the sixth-grade reading level. The student with the lowest score in the sample had a reading level of 3.3. The next lowest score was a student at the fifth grade level.

Procedures

In addition to completing a demographic profile, students read six short stories from young adult multicultural anthologies and completed demographic, prior knowledge, and reading comprehension instruments. The short stories were divided into two sets, each containing three stories, each of which represented a different cultural orientation: African American, Chinese American, and European American. Three of the stories featured female protagonists. In session one, students completed a demographic/reading behavior survey. In the next session, students completed a prior-knowledge instrument that measured their understanding of the texts' cultural and general content. In each of the three subsequent sessions, students independently read a text. To ensure that students were not influenced by the order, texts were counterbalanced within each text set. After reading each story, stu-

dents answered literal and inferential multiple-choice reading comprehension items. Students then completed a short post-survey, which posed questions concerning their interest level, text difficulty, and familiarity. This process was repeated for the second set of texts.

Instruments: Selected Texts, Prior Knowledge, and Reading Comprehension

Six stories were selected through a review of published multicultural young adult anthologies. The selection involved identifying short stories that included more than 25 cultural references. This ensured enough items to develop a quantitative measure using Rasch analysis (Wright & Mok, 2000). Stories that met this criterion were then analyzed for comparable readability and length. Two stories representing each of the cultural orientations were selected. The cultural orientations were selected based on the varying degrees of familiarity the African American students were assumed to have of each of these cultural belief systems. The Lexile readability measure was used, as reported in Table 1. This score indicates the reading demand of the text in terms of the semantic difficulty and syntactic complexity (Smith, Stenner, Horabin, & Malbert, 1989).

Table 1. Selected Texts

Story Name	Cultural Orientation	Length (# of Words)	Lexile	Gender / Text Set	Topic(s)
"Into the Game"	African American	2,976	600	Male/1	Changing Friendship First Paycheck Learning to Talk to Girls
"Block Party"	African American	3,283	730	Female/1	Mother-Daughter Relationships Friendship
"Fox Hunt"	Chinese American	2,799	690	Male/1	Family Ancestry Test Preparation
"Chang"	Chinese American	7,204	730	Female/2	Family History Multiethnic heritage
"Great Moves"	European American	3,416	660	Female/2	Changing Friendship School Dance
"Y2K.CHATRM43"	European American	3,565	620	Male/2	Changing Friendship Global Politics

A multicultural representative panel was formed to ensure that the general and cultural information in each story was accurately interpreted and categorized. Members of the cultural/ethnic groups that these stories represented were expected to have some degree of insider perspective and experiences with the cultural information in the stories. Five people representing each of the ethnic cultures read each of the stories and coded the 25 general and cultural items. Stories were coded by identifying an item (selected phrase, word, expression, statement, or belief), providing a definition, categorizing it as general or cultural, by type (social convention/custom, vocabulary word, language, fact, belief), and identifying any considerations that might influence the interpretation of the item. The panel was given the following working definitions for general and cultural knowledge. "General mainstream information" was defined as core American information or knowledge of popular culture as expressed by non-ethnic mass media, television, or newspapers. Individuals from any cultural or ethnic group would have equal access to this type of knowledge. The working definition for "ethnic-specific cultural information" was items that members of a cultural or ethnic group would be more likely to know as a result of their interactions or experiences with other members of that group.

Because the prior knowledge and reading comprehension instruments were based on the content of the specific text, existing items were unavailable. Therefore, the researcher constructed these items and conducted item analysis using Rasch model analysis (Wright & Mok, 2000). The instruments were piloted in spring 2001 with 19 eighth-grade students. Reliability coefficients on the prior knowledge instrument and reading comprehension items were 0.74 and 0.70, respectively. Forty-six prior knowledge items and 13 reading comprehension items had high misfit values and were deleted.

The two prior knowledge assessments combined items from three of the stories, one from each cultural orientation. There were 193 prior knowledge items in text-set one and 198 items in text-set two. Question formats included binary choice, free association, and multiple choice (translation, synonyms, and antonyms). The yes/no binary choice items inquired about the students' experiences with the activities in the stories (i.e., Have you ever been on a subway train with your friends?). Students were given an opportunity to write what came to their mind on the free association questions (What do you think of when you hear the words *standardized achievement test*?). The remaining questions tested specific knowledge, as opposed to merely self-report. Students were asked to demonstrate their vocabulary knowledge, phrase translation ability, and respond to items that related to the specific details in the story. This measurement included items that inquired about their knowledge of culture-specific vocabulary, proverbs and sayings, language style and

use, and historical knowledge. Examples of the general and cultural multiple-choice items for each of the cultural orientations are provided in Table 2. The questions required the students to either answer a question or translate a phrase or saying using four options. They also identified the synonym or antonym for select vocabulary words.

Table 2. Examples from Prior Knowledge Instrument

African American

What does “*freshly clipped shape-ups*” refer to? (Culturally Bound Knowledge Item)

- | | |
|---------------------|-------------|
| a. Exercise routine | c. Food |
| b. Flower | d. Hair cut |

Which of the following would you expect to see on a paycheck? (General Knowledge Item)

- | | |
|------------------|----------------------------|
| a. F.I.C.A. | c. Savings account balance |
| b. Parents’ name | d. Lunch menu |

Chinese American

Shaolin Temple is located in (Culturally Bound Knowledge Item)

- | | |
|---------------|----------|
| a. Colorado | c. China |
| b. California | d. Chile |

When do students take the *PSAT*? (General Knowledge Item)

- | | |
|----------------------|-------------------|
| a. After the MCAT | c. Before the GRE |
| b. After High School | d. Before the SAT |

European American

Feathered is a type of (Culturally Bound Knowledge Item)

- | | |
|--------------|---------|
| a. Dress | c. Car |
| b. Hairstyle | d. Food |

When something is a *force of habit*, it is (General Knowledge Item)

- | | |
|----------------|---------------|
| a. Involuntary | c. Chosen |
| b. Voluntary | d. Controlled |

The reading comprehension assessment for each story was administered individually after the students read the selected texts. The instruments were each composed of 30 multiple-choice items. Examples of the reading comprehension items are presented in Table 3.

Table 3. Reading Comprehension Instrument Item Examples

African American

The boys looked lonesome even though they had just gotten

- | | |
|----------------|----------------|
| a. A promotion | c. Haircuts |
| b. A new Lexus | d. New clothes |

The boys received the money they earned minus

- | | |
|--------------------------------------|------------------------------|
| a. Their lunch money | c. Dues for their membership |
| b. Social Security and Federal taxes | d. The cost of stamps |

Chinese American

To escape pressure, Andy daydreamed about

- | | |
|------------------------|---------------------|
| a. Being popular | c. His ancestors |
| b. Exciting adventures | d. Going to college |

Both Lee and Andy were interested in studying for the

- | | |
|---------|---------|
| a. LSAT | c. PSAT |
| b. SAT | d. GRE |

European American

The big event that Brenda and Annie were discussing in Annie's room was

- | | |
|---------------------------|-------------------|
| a. Christmas Party | c. Birthday party |
| b. A Valentines day dance | d. A sleep over |

When they were in Annie's bedroom Brenda was having trouble being Annie's best friend because of

- | | |
|-------------|-------------|
| a. Jealousy | c. Fear |
| b. Anger | d. Betrayal |

Measures

The prior knowledge measurement included the number of correct responses to the multiple choice, translation, and synonym/antonym items. There were 50 multiple-choice, 63 translation, 33 synonym, and 18 antonym items for text-set one. Text-set two included 112 multiple-choice, 39 translation, 13 synonym, and 15 antonym items. The student measure is based on the number of multiple-choice items the students responded to correctly. The item reliability for the prior knowledge items was 0.95. In text-set one, there were 96 general prior knowledge items. In text-set two, there were 74 general prior knowledge items.

Literal and inferential item types were included and used for each text's reading comprehension instrument. The reading comprehension instrument for each text consisted of multiple-choice items, each with four answer options.

These items tested reading skills such as interpreting attitudinal meaning, understanding explicitly stated information, understanding implicit information in the text, understanding conceptual meaning, understanding relations between parts of the text, and distinguishing the main idea from supporting details. Reliability of this measurement instrument was determined by the Rasch model analysis (Wright & Mok, 2000). The reliability for the combined reading comprehension item was .93.

Data Analysis

To measure the effects of cultural orientation of texts, prior achievement, and prior knowledge on the students' reading comprehension performance, the study used the Rasch model and a one-way analysis of variance (ANOVA). The Rasch Rating Scale Model (Wright & Mok, 2000) provides estimations of difficulty of the comprehension and prior-knowledge items (Wright & Stone, 1979). This psychometric model generates estimates of a person's ability in the same linear metric as the items, and tests the fit of the data to the model. The model makes it possible to provide the probability that a person at a given position should succeed on certain items and fail on others. A detailed analysis of the prior-knowledge items was conducted to determine their relationship with reading comprehension performance for each story type.

Results

The purpose of the study was to determine the role cultural relevance plays in the reading comprehension process. A basic assumption throughout this analysis is that cultural knowledge is a significant tool that mediates the comprehension process. Some students may appear to be low-performing, when in fact they are being assessed with material that does not match their schemata. To determine whether this is the case and if access to prior knowledge differs for students at different ends of the achievement spectrum, three achievement groups were explored in this study: high, mid-range, and low. High-achieving students significantly outperformed the mid-range and low achieving students on the African American, Chinese American, and European American texts and reading comprehension instruments, as reported in Tables 4 and 5. This finding is linked to what reading research has uncovered in the exploration of struggling and expert readers: skilled readers use strategies such as looking back in the text, making predictions, and invoking their prior knowledge that unskilled readers lack (Garner & Reis, 1981; Oakhill & Patel, 1991; Pressley, Brown, Van Meter, & Schuder, 1995; Swanson & De La Paz, 1998).

Table 4. Means and Standard Deviations of Reading Comprehension Student Measures by Prior Achievement

Cultural Orientation and Achievement Level	N	Mean	SD	SE	Minimum	Maximum
African American						
High	28	62.74	9.79	1.850	39.63	80.77
Mid-Range	41	57.39	7.67	1.198	43.81	75.46
Low	34	49.50	8.57	1.470	34.76	67.16
Total	103	56.24	9.97	.983	34.76	80.77
Chinese American						
High	29	62.64	8.81	1.637	40.67	78.37
Mid-Range	40	55.94	6.23	.984	42.47	72.83
Low	33	49.76	6.24	1.086	38.66	65.62
Total	102	55.85	8.61	.853	38.66	78.37
European American						
High	29	62.27	7.42	1.378	46.39	73.57
Mid-Range	40	55.65	5.30	.837	43.68	65.31
Low	31	49.62	7.67	1.378	32.97	63.45
Total	100	55.70	8.29	.829	32.97	73.57

Note: SD = standard deviation; SE = standard error.

Table 5. Analysis of Variance Summaries of Reading Comprehension Student Measures by Prior Achievement

Cultural Orientation	Sum of Squares	df	Mean Square	F	Sig.
African American					
Between Groups	2781.9	2	1390.10	18.89	.000
Within Groups	7365.4	100	73.65		
Total	10147.4	102			
Chinese American					
Between Groups	2560.3	2	1280.17	25.70	.000
Within Groups	4930.9	99	49.81		
Total	7491.2	101			
European American					
Between Groups	2398.4	2	1199.21	26.43	.000
Within Groups	4401.9	97	45.38		
Total	6800.3	99			

Note: Df = degrees of freedom. F = ratio of two s squares.

High-achieving students had the highest means for reading comprehension on the culturally relevant texts. This pattern implies that high-achieving students may have the ability to negotiate across the cultural contexts of the short stories. On the other hand, low-achieving students' reading skills may hinder their ability to use prior knowledge as a tool in the comprehension process given that they may struggle with basic facets of the reading process. In comparison, the mid-range students' reading skills may place them in a position to effectively use their culturally bound prior knowledge to better comprehend the culturally relevant texts. It is important to consider the value of this finding for students who read slightly below grade level.

Table 6 presents results from an analysis that classified students by their levels of culturally bound prior knowledge of the different cultures presented in the short stories. Students with a large amount of prior knowledge of their own culture performed well on each of the reading comprehension measures. This suggests that students who know about their own culture's values, history, expressions, and practices are better able to negotiate meaning in other cultural contexts.

Table 6. Descriptive Statistics for Culturally Bound Prior Knowledge Levels and Reading Comprehension

Cultural Knowledge Level	Mean	SD	SE
African American Reading Comprehension			
High (N = 39)	64.53	8.19	1.31
Mid-Range (N = 36)	56.90	7.55	1.26
Low (N = 36)	47.84	6.80	1.13
Total (N = 111)	56.64	10.17	.97
Chinese American Reading Comprehension			
High (N=39)	62.34	8.06	1.29
Mid-Range (N = 34)	56.32	5.12	.88
Low (N = 36)	48.84	6.55	1.09
Total (N = 109)	56.00	8.73	.84
European American Reading Comprehension			
High (N = 39)	62.18	6.87	1.10
Mid-Range (N = 35)	56.30	5.96	1.01
Low (N = 34)	48.85	6.72	1.15
Total (N = 108)	56.08	8.50	.82

Note: SD = standard deviation; SE = standard error.

An analysis of how reading ability and culturally bound prior knowledge function to support reading comprehension requires categorizing the sample by their reading and cultural knowledge levels (high, mid-range, low) and their culturally bound prior knowledge levels (high, mid-range, low). This classification yielded nine categories. For example, students were identified as High reading-High cultural knowledge, Mid-range reading-Low cultural knowledge, Low reading-High cultural knowledge, or Mid-range reading-Mid-range cultural knowledge. Only students who completed the reading comprehension assessments for both of the African American texts were included in this analysis. The correlation between the students' grade-equivalent reading score and their culturally bound prior knowledge level was .606, which was significant at the 0.01 level.

As the cross tabulation in Table 7 shows, student levels of African American, culturally bound prior knowledge were not necessarily the same as their prior achievement category. Fifty-six percent of the high-achieving students had high prior culturally bound knowledge. Thirty-nine percent of students achieving at mid range had high levels of culturally bound prior knowledge, whereas, 37% of the low-achieving students had high or mid-range levels of culturally bound knowledge. For some students, reading scores on the Iowa Test of Basic Skills were not necessarily associated with their level of culturally bound prior knowledge.

Table 7. Cross Tabulation Prior Achievement Level and African American, Culturally Bound, Prior Knowledge Level

Prior Achievement Level	Culturally Bound Prior Knowledge Level			
	High	Mid-Range	Low	Total
High	17	11	3	31
Mid-Range	16	16	9	41
Low	3	10	22	35
Total	36	37	34	107

ANOVA was conducted to evaluate the relationship between students' African American culturally bound prior knowledge classification and their reading comprehension performance. The ANOVA was significant: $F(8.94) = 13.62$, $p = .000$. As the means plot depicted in Figure 1 illustrates, high culturally bound prior knowledge functions as a support for reading comprehension for the African American stories. The x axis represents the students' categorization by reading level (high, mid-range, low) and culturally bound prior knowledge level (high, mid-range, low). Reading comprehension scores are represented on the y axis.

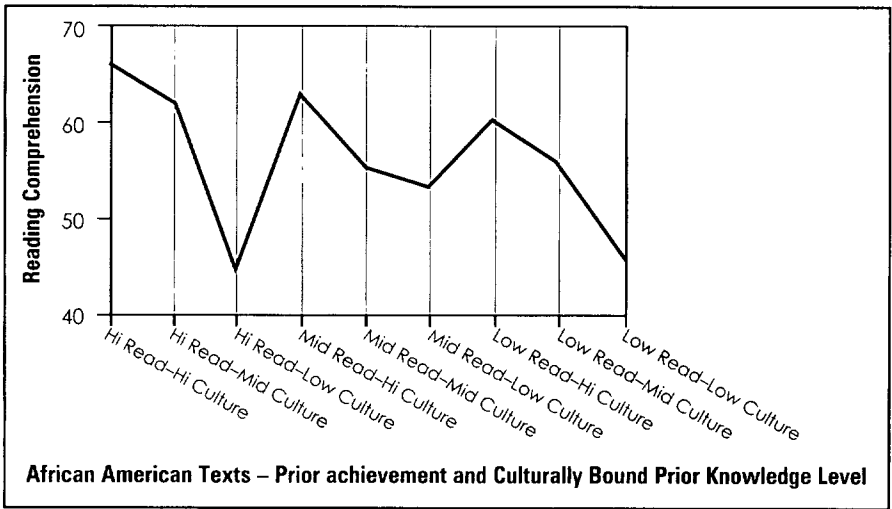


Figure 1. Prior achievement and culturally-bound levels and reading comprehension for African American texts.

The graph shows that the students with lower reading levels but higher levels of cultural knowledge have higher reading comprehension scores than the students with higher reading levels but lower levels of culturally bound prior knowledge. For example, the mean reading comprehension score for the mid-range reading students with high culturally bound prior knowledge levels is greater than the mean for students with high reading levels whose culturally bound knowledge score falls in the mid-range. Students with high reading levels and low levels of cultural knowledge have lower scores than their peers with low reading levels and high, mid-range, and low levels of culturally bound prior knowledge. Finally, students with low reading levels but high culture knowledge scored higher than students with mid-range reading ability and low cultural knowledge. In other words, the level of cultural knowledge influenced students' comprehension despite their placement on the reading achievement spectrum. Figure 2 illustrates results for Chinese American texts and culturally bound prior knowledge. Knowledge of the Chinese American culture also supports reading comprehension, but the degree and pattern are different from those among African American texts. These results strongly suggest that culturally bound prior knowledge plays a significant role in supporting African American students' reading comprehension.

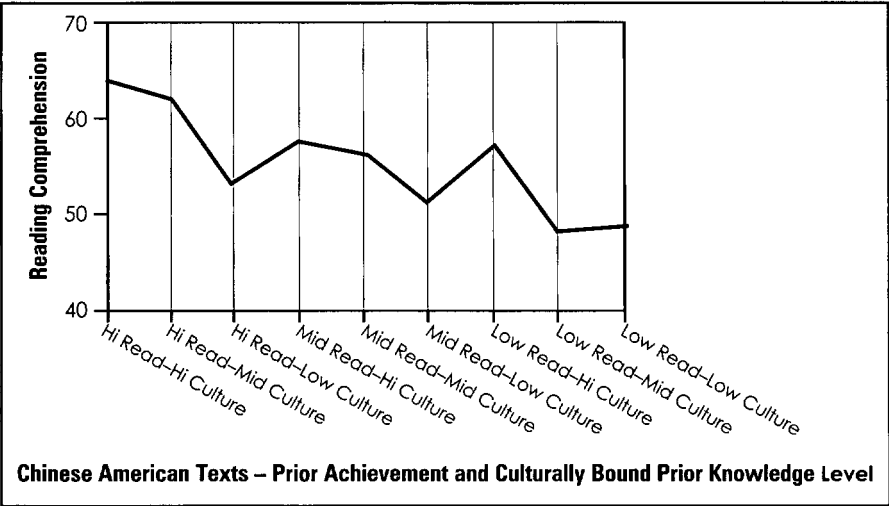


Figure 2. Prior achievement and culturally bound levels and reading comprehension for Chinese American texts.

Discussion and Conclusion

This exploration of the relationship between cultural orientation of literature and student reading comprehension among low, mid, and high level readers revealed some expected and unexpected results. As expected, high-achieving students significantly outperformed the other students on the African American, Chinese American, and European American texts and reading comprehension instruments. A closer examination of the role that culturally bound prior knowledge plays in the reading comprehension process was conducted by classifying the students by their culturally bound prior knowledge and their reading comprehension levels. The analysis revealed a possibly unexpected result when it showed that students' level of culturally bound prior knowledge of the African American stories content significantly influenced their reading comprehension performance, despite their prior achievement level. This significant result provides support for looking at culturally bound prior knowledge as a cognitive tool that can be used to structure more effective learning tasks.

The importance of exploring the role that prior knowledge plays in text comprehension is vital to disenfranchised students of color. This investigation finds that prior knowledge not only plays a supportive role in reading comprehension for

African American students, but it also has a leveraging effect for readers at different achievement levels. This result supports previous findings that reading culturally relevant texts is beneficial to student performance (Conrad, Gong, Sipp, & Wright, 2004; McCollin & O'Shea, 2005; Pinkard, 2001; Zolbrod, 2006). Considering the cultural load of many texts used in the classroom, this study of culturally bound prior knowledge expands the current research conversation by examining distinct types of prior knowledge.

This examination of the effect of culturally relevant literature on student reading comprehension has implications for curricular design, classroom instruction, reading intervention strategies, and assessment. The data clearly illustrate that a high level of culturally bound prior knowledge supports students' reading comprehension. This finding is particularly important to readers at the mid-range achievement levels given that those mid-range achievers with high levels of the cultural knowledge outperformed high-achieving readers whose knowledge of the cultural content was low. The findings support the positive impact of cultural relevance on reading comprehension performance and shed light on No Child Left Behind's limited goal of proficiency for lower-income students (Wyner, Bridgeland, & DiIulio, 2007). Incorporating prior knowledge strategies can support teachers in their quest to maintain and promote high achievement for students who meet or exceed standards.

Although prior knowledge is discussed in teacher manuals, and many strategies exist, the use of prior knowledge as a cognitive tool that connects prior learning in the classroom with prior knowledge derived from experiences outside of school is limited (Myhill & Brackley, 2004). Understandably, developing curriculum around each student's prior knowledge would be an impossible task. However, this study's findings provide support for developing curricula that assess students' prior knowledge of a topic or concept when introducing a new concept. This approach could help teachers identify gaps in student understanding, and in response they could tailor classroom activities accordingly. Another implication that addresses the instructional power of prior knowledge is its value when learning new skills. Placing a skill lesson in a familiar context, whenever possible, may scaffold the learners' acquisition of the new concept by decreasing the amount of new information. This approach is in line with Wertsch's (1991) toolkit framework, as well as other sociocultural educational theories (Baker & Sonnenschien & Serpell, 1994; Lee & Slaughter-Defoe, 1995; Maehr, 1974; Saito, 2000; Wertsch, 1991).


This study's contribution to reading research lies in its investigation of culturally bound prior knowledge in relation to reading comprehension for students at various achievement levels. The importance of investigating students' prior knowledge increases when the text contains a significant amount of cultural knowledge.

When the text includes language, phrases, expressions, historical facts, and scripts from different ethnic groups, equal prior knowledge cannot be assumed. The significance of this result ties directly to the importance of examining textual content for cultural load and determining students' prior understanding and experiences of the texts' general and cultural knowledge in formative determinations of comprehension performance. Because culturally bound prior knowledge is strongly associated with comprehension, it follows that intervention strategies that increase students' cultural knowledge of their own and different racial and ethnic groups could be beneficial for reading comprehension performance.

This study is not without limitations, and the results should be interpreted accordingly. First, the sample size was small and varied among the school groups. Although the sample was drawn from four different schools, it is impossible to make generalizations about application of the results to other populations. Second, all subjects were in eighth grade. Therefore, the results cannot be generalized to similar groups in other grades. Third, only one racial group was considered for this analysis. Although the sample allowed a unique opportunity to investigate within-group variability that may have been overlooked in a group comparison, a cultural comparison group was not included in the analysis. As for the texts themselves, stories were selected on the basis of the amount of cultural knowledge in the text. A large number of instances of cultural knowledge were needed for the quantitative analysis by item type. Because these texts were from anthologies of young-adult fiction and not artificial text, they are not exact parallels in terms of length, story grammar, structure, or cultural content. Therefore, other characteristics of the text may be affecting comprehension performance. Therefore, the results may, in part, be due to text effects. Finally, the findings may likely be confounded by the difficulty level of the text.

To better understand the role that culturally bound prior knowledge plays, researchers could use comparative groups to determine whether the items relating to the African American stories were easier questions or were easier for the African American students. Because measuring reading skills often involves both fiction and nonfiction stories, a replication of this study should also be conducted using both forms of literature that contain cultural knowledge. The presentation of cultural knowledge in fiction and expository texts may have a different effect on reading comprehension. Finally, qualitative interviews could be used to uncover how students access culturally bound prior knowledge while reading. A meta-cognitive exploration could identify textual triggers that scaffold understanding and performance.

In conclusion, the results provide validity for culturally relevant teaching by exploring the relationship between prior knowledge, reading materials, and perfor-

mance. The findings are important for students performing in the middle ranges, those who are disenfranchised and whose cultural experiences are unrelated to many of their academic tasks. Using culturally congruent materials with students of color to assess and teach reading skills may prove more successful than ignoring cultural tools in the reading process. Equipping teachers with valid support for their use of culturally congruent material is an easily replicable way to use “culture as a lever to support learning” in the classroom (Lee, 2001, p. 136). 

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About the Author:

Ruanda Garth McCullough, Ph.D., is an assistant professor in the Department of Curriculum and Instruction at Loyola University of Chicago. She earned her doctorate and masters degrees in Urban Education from the Department of Education at the University of Chicago. She received her BA in Psychology and African American Studies from Wesleyan University in Middletown, Connecticut. Her main fields of interest include: sociocultural foundations of education, sociology of education, classroom processes, literacy, urban education and reform. Ruanda's dissertation was titled "Comprehending Culture: The Influence of Culture-Specific Prior Knowledge in the Reading Process."





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Bound Prior Knowledge on Comprehension Performance
SOURCE: Read Horiz 49 no1 O/N 2008

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