Does Book Reading Matter and For Whom?

Leisure Reading Habits and Reading Performance for Male and Female Undergraduates

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Poster to be presented at the Annual Meeting of the American Educational Research Association,

May, 2010, Denver
Abstract

This study reports a mixed-methods investigation (N = 60) of undergraduates’ self-reported reading habits, interactions with two informational texts during think-alouds, and reading performance in identifying and recalling important ideas. Reported book reading differed strongly between males and females; 43% of males reported reading books compared to 84% of females. For males, book reading related to differences in performance, with a reliable difference observed in performance on the more unfamiliar text on statistical inference. Male book readers scored higher on this passage (M = 1.17) than non-book readers (M = .31), despite lower pre-test scores for topic knowledge and topic interest. Analyses of think-alouds from both groups of males revealed non-book readers as more likely to exhibit ineffective strategic behaviors.
What college students bring to school-related reading activities in the way of an approach to reading encompassing both attitude and strategic capabilities may be related to their out-of-school, self-selected reading. Those undergraduates who choose to read for enjoyment, and who choose for their leisure reading lengthy, connected texts may be more capable and confident readers. However, the National Endowment for the Arts (NEA) has identified several disturbing trends relating to frequency and nature of leisure reading, among them a decline in leisure reading, particularly book reading, over adolescence, with this decline continuing into the college years (NEA, 2007). Frequency of leisure book reading is consistently and strongly associated with reading performance, with more frequent book readers scoring higher on reading assessments (NEA, 2007). Ability to handle complex text has been identified as one of the keys to college readiness (ACT, 2006); experience with extended, connected text through book reading is an essential aspect of the development of such ability. Further, we know that reading habits and gender are consistently and strongly related throughout the lifespan, with females likely to read more, and to report enjoying reading more than males (NEA, 2007; Pitcher et al., 2007).

This investigation considers undergraduates’ gender and self-reported leisure reading habits, particularly book reading, as linked to possible patterns in their observed reading behaviors and performance when reading passages from their course textbook. It is an extension of an earlier mixed-methods exploration of person-based and text-based factors associated with undergraduates’ more or less successful learning from typical college texts and the interaction of those factors (Fox, Dinsmore, Maggioni, & Alexander, 2009). The extension consists in taking into consideration students’ gender and their leisure reading habits as possible relevant person-level factors.
Theoretical Framework

The constructive activity of reading comprehension has been conceptualized as involving the interrelated elements of reader, text, and activity or purpose for reading (RRSG, 2002). Our consideration of undergraduates’ leisure reading, school-related reading, and gender is organized around these three elements.

Activity. College students are expected to read extensively and independently in domains to which they may still be becoming acclimated (Simpson & Nist, 2002). The activity of reading, understanding, and remembering the gist of assigned textbook material that may vary widely in its relevance to the student’s long-range educational goals or appeal to immediate interest is a typical task and purpose for college-level reading. Voluntary or leisure reading outside of assigned school work is reading that is self-selected, read at a self-chosen time and place, and for a self-identified purpose. In this context, leisure reading of books by undergraduates carries more weight as a deliberate choice requiring persistence and interaction with complex, interconnected text than the reading of more casually available and briefer material such as on-line text, newspapers, or magazines.

Reader. Constructing knowledge from text requires some background subject-matter knowledge, and proceeds more effectively for readers who possess such knowledge (Ferstl & Kintsch, 1999; McKeown, Beck, Sinatra, & Loxterman, 1992). A given reading situation will call for more or less effort from a reader, and readers may be more or less motivated to engage with a particular text due to a number of possible factors, including: initial level of interest in the text topic or situationally sparked interest in the text; dispositional tendency to engage in cognitive effort, or need for cognition (Cacioppo, Petty, Feinstein, & Jarvis, 1996; Dai & Wang, 2005); and specific tendency to put effort into reading and learning from text. The success of
readers’ efforts at comprehending and learning also varies depending on their knowledge related to reading, which guides their flexible enactment of appropriate reading strategies (Paris, Wasik, & Turner, 1991).

Leisure reading habits have repeatedly been found to have a strong relationship to reading achievement. (e.g., Greaney, 1980; Greaney & Hegarty, 1987; Foertsch, 1992), although this has been more studied in younger students than in college students. This could be because stronger readers choose to read more, or because reading more strengthens background knowledge, inclination for self-directed and effortful engagement, and competence with reading strategies, or both. Gender also matters as a reader characteristic, with it repeatedly being found that females tend to perform better than males at reading tasks and also report stronger leisure reading habits (e.g., NEA, 2007).

Text. Factors thought to be associated with the level of challenge presented by a given text include familiarity, interestingness, and accessibility. Greater familiarity of the text information is likely to promote more successful knowledge construction (Alexander & Jetton, 2000). Perceived interestingness of text can promote greater engagement and possibly better learning from text (Wade, Buxton, & Kelly, 1999). Perceived accessibility of the text in terms of difficulty, vocabulary, organization, quality of explanations, and appropriate use of text features can also be associated with more successful learning (Armbruster, 1984).

The two textbook passages used in this investigation (Cozby, 2007) were expected to present different levels of challenge, with one being more familiar, more interesting, and more accessible and providing more of a scaffolded reading experience, as the students would already have covered the material in class and been directed to the important ideas it contained. The
other was unfamiliar, less interesting, and less accessible, and taxed the students’ ability and inclination to read independently in these circumstances.

**Summary.** This study is a mixed-methods investigation of undergraduates’ leisure reading habits considered in relation to their performance in reading and getting the gist of more or less familiar and accessible passages from their course textbook, as viewed through the lens of gender. The research questions addressed are: 1) Are there gender differences in the reported reading habits of undergraduates? 2) Do gender and reading habits relate to reading performance? 3) Do gender and reading habits relate to reading behaviors as observed during think-alouds?

**Methods**

**Participants**

The participants were 61 (32 female) college undergraduates taking an upper-level elective Research Methods course at a four-year school in a mid-Atlantic state, predominantly upperclassmen with a wide range of identified majors. One participant in that initial pool did not identify gender, and is not included in any analyses using grouping by gender. Participants were enrolled in either one section in fall 2007 or one of three sections in spring 2008. They received extra credit in the course for their participation, which was on a voluntary basis. Although required for several majors, this course itself does not align with any specific major at the university. It tends to be populated by students with a wide range of interests and academic capabilities, including some who need an upper-level elective prior to graduation and are looking for a course that will not have a heavy workload. Reading of their course textbook by such participants was thought to be a good exemplar of the type of college reading outlined in our section above on Activity.
Participants were predominantly upperclassmen with a wide range of identified majors, including sociology, English, public health, economics, criminal justice, psychology, and journalism. Their ages ranged from 18 to 30, with a mean of 21.0. Their reported ethnic background was reasonably diverse, given the makeup of the student population at the university, with 49% of participants self-reporting as European American, 23% as African American, 11% as Hispanic American, 5% as Asian American, and 7% as other; three participants (5%) did not respond to this question. Their self-reported college GPAs ranged from 1.60 to 4.00, with a mean of 2.98 (one participant did not respond) and their cumulative college credits completed ranged from 15 to 156, with a mean of 79 (one participant did not respond). They thus appeared to be a reasonably representative sample of typical undergraduates at the university for this reading situation.

Measures

Demographics and reading habits. Participants completed a demographics questionnaire giving background information on gender, ethnicity, age, cumulative college credits completed, major, and average college GPA. They were also asked to briefly describe their reading habits in two open-ended questions asking them to indicate about how often they read books or other materials outside of their assigned coursework, and what they typically read. The two open-ended reading habits questions were transcribed and coded using content analysis to identify themes and create categories. Reading frequency categories developed included daily, occasionally or regularly, during school breaks, and rarely or never. Reading material types included books, online, magazines, and newspapers, with more than one response possible per participant.
**Interest.** An 8-item interest rating questionnaire assessed interest in topics related to research methods. Responses were on a 1 to 5 scale, where 1 was Not at all interested and 5 was Very interested. The topics were taken from the chapters in the course textbook (Cozby, 2007) and included: scientific method, research design, experimental research, qualitative research, reliability and validity, statistical inference and analysis, understanding research results, and evaluating research. Reliability was relatively strong, with a Cronbach’s alpha of 0.76. This measure has a potential minimum of 8 and a maximum of 40. In our sample, the mean was 27.1 (SD = 4.94), with a range of 14 to 38.

**Need for Cognition.** Participants completed the 18-item short Need for Cognition (NFC) scale (Cacioppo, Petty, & Kao, 1984), using a 5-point response format in which they indicated for each statement the degree to which it was characteristic of them, with 1 = Extremely uncharacteristic of you and 5 = Extremely characteristic of you. Half of these items are reverse coded, and higher scores indicate a higher need for cognition. Reliability for this measure was strong, at $\alpha = 0.85$. This measure has a potential minimum of 18 and a maximum of 90. In our sample, the mean was 61.22 (SD = 10.11), with a range of 41 to 82.

**Knowledge.** Participants completed an 18-item multiple choice assessment of their overall knowledge of research methods, and two 10-item multiple choice assessments of their knowledge of the topics of statistical inference and the scientific approach. The items used were taken from the quizzes and tests packaged with the textbook; these quizzes and tests were not used during the course by the instructors. Items were by an instructor in the Research Methods course as providing good coverage of relevant material. Some minor adaptations to improve the quality of distracters were made where needed. One point was awarded for each correct response on all three measures, giving a potential minimum for all three measures of 0; the
potential maximum was 18 for the overall knowledge measure and 10 on the topic knowledge measures.

In our sample, the mean for overall knowledge was 12.56 \((SD = 2.43)\), with a range of 7 to 18. The mean for topic knowledge of scientific approach was 6.57 \((SD = 1.95)\), with a range of 1 to 10. The mean for topic knowledge of statistical inference was 4.49 \((SD = 1.43)\), with a range of 2 to 8. Based on the standard of inter-item consistency provided by Cronbach’s alpha, reliabilities for these measures was low, with an \(\alpha\) of 0.44 for the domain knowledge assessment, 0.55 for the scientific approach topic knowledge assessment, and 0.017 for the statistical inference topic knowledge assessment. This is not atypical for assessments in low-knowledge or fragmentary knowledge situations and with high homogeneity of the sample (Bernardi, 1994). In this situation, these knowledge measures were considered to be appropriate as indicators of students’ relatively low levels of knowledge, but are not used in statistical comparisons.

Text Passages. The reading task used in this study involved two passages taken from the course textbook (Cozby, 2007) that were selected and adapted to be as parallel as possible. One passage, on the scientific approach (SA), was taken from the first chapter of the book and presented material that should have been relatively familiar to the students as having been covered in the assigned reading and discussed in class. The second passage, on statistical inference (SI), was taken from chapter thirteen of the book, and presented material that was expected to be less familiar to the participants. It had not yet been covered in class, but was going to be covered in the classes immediately following students’ participation in this research, so that it was not taken out of sequence in the coursework or presented before they should have been adequately prepared to read it. The passage addressing statistical inference was found to present greater challenges in terms of participants’ lower topic interest and knowledge, and in
terms of the text’s lower perceived familiarity, accessibility, and interestingness, due to the nature of its subject matter (Fox et al., 2009). Despite the fact that it did not include any mathematical content, participants tended to see this passage as more mathematical in nature, and therefore brought to bear any predispositions or preconceptions regarding their own likely interest or competence that mathematics evoked.

The selected passages were condensed slightly to provide a self-contained text that would offer similar levels of difficulty for readers in terms of length, structure, and reading level. The adapted passages were very close in length and difficulty (1670 words for scientific approach and 1673 for statistical inference, Flesch-Kincaid Grade level of 12.0 for both, and Flesch-Kincaid Reading Ease of 37.8 for scientific approach, 39.8 for statistical inference). Each was three pages of single-spaced text. Each included a title, headings, and bolded words, and each had two figures, which were text boxes for the scientific approach passage and decision matrices for the statistical inference passage. Figures were positioned (as they had been in the textbook) in the center of the page.

Each text discussed a particular way of knowing about human behavior. The first passage described the scientific approach, contrasting it to intuition and authority, and then going on to discuss how scientists develop knowledge, the role of empiricism, and skepticism. The second passage described how random error affects our ability to make conclusions about the true state of affairs in the population, discussed the role of the null and research hypothesis, and the two types of error in statistical inference. Each passage included appeals to the reader’s personal experience and concluded with an extension of the discussion to everyday content and then a very specific example of that everyday content. In the scientific approach passage, this involved pseudoscientific claims and rumors presented in the media, and specifically a rumor
regarding the elimination of the gene for blond hair. In the statistical inference passage, the
everyday content related to type one and two errors as applied to jurors deciding on guilt or
innocence and then specifically to the situation of trying to decide whether someone is the right
person to marry.

**Think-alouds.** Participants were asked to think aloud while reading each of these
passages, and their think-aloud was recorded on an audiotape. They were told to verbalize what
they were thinking and doing as they read each passage, and practiced thinking aloud on a short
passage before moving on to the textbook passages. They could read aloud or not, as they chose.
They were told that when they finished reading the passage, they would be asked to respond to
open-ended questions regarding what they remembered and what they thought about the passage.
The 120 think-alouds (two were missing due to taping mishaps) were transcribed and coded for
strategic and evaluative/monitoring behaviors; inter-rater reliability for an independently coded
subset of the data was high (Fox et al., 2009).

**Outcomes.** Learning outcomes were assessed immediately after reading by an open-
ended question asking the participant to summarize the passage from memory in writing, giving
the main idea along with any supporting details they could recall. Scores for the learning
outcomes were based on the number of important ideas from the passage correctly stated; inter-
rater reliability for an independently coded subset of the data was high (Fox et al., 2009).
Participants were also asked to evaluate the author’s presentation of the material in writing, again
in an open-ended format. Responses to the evaluation question were coded for number of
positive or negative evaluations of aspects of the passage’s familiarity, accessibility, and
interestingness (Fox et al., 2009). Results from this coding confirmed the greater perceived
difficulty and unfamiliarity and lower interestingness of the SI passage.
Procedure

Participants were told that their participation would involve two components. In the first part, participants were given, in order, the demographics questionnaire, interest questionnaire, need for cognition scale, domain knowledge measure, and topic knowledge measures. Administration of the topic knowledge measures was counterbalanced such that 29 undergraduates saw the scientific approach measure first, while the other 32 saw statistical inference first. There were no time limits for completion. Participants were encouraged to respond to every item on each measure, and for the knowledge measures, were told that guessing was okay. The average time for completing the first part was roughly 30 minutes. They could then take a brief break before beginning the second part.

In the second part, participants practiced thinking aloud with a short passage on mosquitoes, from a popularly written science article. This passage was intended to be mildly interesting but not too challenging, so that participants might naturally find themselves responding to the topic and descriptions. Participants varied considerably in their comfort with thinking aloud. Once participants felt they were ready, they then read and thought aloud for either the scientific approach or statistical inference passage. Administration of passages was counterbalanced such that those 29 participants who saw the scientific approach topic knowledge measure first also read that passage first, and similarly for statistical inference.

When participants indicated that they were finished reading the passage, the passage was taken away, and they were given the packet of three outcome questions. They were told that they could complete the questions in any order and look back and forth between their responses on the questions if they wished. Upon completing the outcome questions, the participants were again reminded of the think-aloud directions and given the other passage, following the same
procedure as outlined above. There was no time limit for any of these tasks. Participants tended to take very nearly the same time for each passage, and the average time for the second part was roughly 60 minutes.

**Results/Conclusions**

The research questions addressed are: 1) Are there gender differences in the reported reading habits of undergraduates? 2) Do gender and reading habits relate to reading performance? 3) Do gender and reading habits relate to reading behaviors as observed during think-alouds?

**Reading habits and gender differences.** Table 1 gives the breakdown of reading habits within our sample for reading frequency and type of material, for the total sample and by gender. The majority of participants (82%) reported typically doing some reading outside of schoolwork, with more than a third reporting some manner of daily reading. The infrequent or non-readers were more likely to be males, while those who reported reading primarily during school breaks tended to be females. Only two participants (both male) indicated that they did no reading outside of assigned coursework. Online readers were more likely to be males. Females were much more likely to report reading books; this difference was statistically significant using a two-way $\chi^2$ and applying Yates’s correction for small expected frequencies, $\chi^2 (1, N = 60) = 9.57, p < .01$.

**Reading performance, reading habits, and gender.** Reading frequency taken by itself did not appear to relate to any patterns in observed reading performance or behavior; one likely contributor was the small numbers of participants in some of the frequency categories. Within these data, indexing of frequency to type of reading being done was not possible; the open-ended
response format did not generate responses permitting consistent cross-organization by frequency and reading material type.

Table 2 gives the mean scores for males and females by reported book reading habits for the descriptive variables GPA, age, cumulative credits completed, total Need for Cognition score, and for the passage-related variables of topic interest, topic knowledge, and outcome score. Because so few females did not report reading books, the descriptive and passage-related differences between book readers and non-book readers can only be suggestive and are hardly conclusive, although they are interesting. Female non-book readers appeared to have a slight edge in knowledge, interest, and resulting performance over female book readers for both passages. Within the males, those who reported reading books showed a trend for better outcome performance on the SA passage, and performed reliably better than non-book readers on the SI passage, \( t (26) = 2.29, p < .05 \). It is particularly interesting that they performed better here when they had somewhat lower pre-test topic knowledge and topic interest scores for this passage.

**Reading behaviors, reading habits, and gender.** Qualitative think-aloud analyses indicated differences by gender among book readers and non-book readers. In their think-alouds, the female non-book readers were generally competent and efficient in their interactions with the texts. They tended to articulate fewer comments indicating that they were using reading strategies than the female non-book readers, but those strategies that they did use were more likely to be indicative of deep-level processing, such as attempting to restate broadly the passage content, making interpretations or elaborations on that content, predicting, questioning, or arguing with the text. Table 3 gives the entire set of think-aloud codes used, and indicates the strategy codes associated with deep-level processing. This pattern of deep-level processing was
reversed for males, with male book readers being more likely to use deep-level reading strategies than the male non-book readers. In addition, male non-book readers were more likely to exhibit ineffective strategic behaviors while reading, particularly for the more unfamiliar SI passage. Several of the male non-book readers who chose to read the passages aloud also appeared to have considerable difficulty with word identification and fluent reading. Much of their effort was therefore devoted to correcting their own miscues and struggling to read this college-level text.

**Summary**

There were clear gender differences in reading habits among the undergraduates in our sample. In particular, book reading habits appear to manifest differently among male and female undergraduates, with females significantly more likely to report reading books outside of their assigned coursework. Gender and reading habits were related to reading performance, but only for males, with book reading at any level of frequency by males tending to be associated with more competent independent reading of course text. The picture is less clear for females, where book reading was a more typical behavior, and non-book-reading did not have appear to be related to poorer independent reading performance in this situation. A look at participants’ reading behaviors via their think-alouds revealed that female non-book readers and male book readers tended to do more deep-level processing as they read, and that among the male non-book readers were several college students who struggle with reading.

**Educational and Research Implications**

On the one hand, gender and reading of books during leisure time did not appear to be related to students’ academic performance in college as reflected in their GPAs or ability to pile up credits. On the other hand, the observed trend for male non-book readers to be less than
competent at independent reading is provocative and disturbing. Equally interesting, although only suggestive, is the finding that female non-book readers appear to be a very different group than male non-book readers, as far as their reading capabilities. A set of profiles of proficient reader subtypes developed by Manzo, Manzo, Barnhill and Thomas (2000) found certain gender-related elements in the four distinct reading types they identified among college undergraduate and graduate students: the developmentally mature androgynous type, the non-fiction reading male orientation, the story-reading female orientation, and the detail-dependent rule followers. Although they labeled all of these as proficient readers because of their status as college students, the findings here suggest that further investigation of how these profiles might play out in terms of students’ abilities to perform college-level independent reading would be informative.

A longitudinal study of students over their college careers (Bray, Pascarella, & Pierson, 2004) found that improved attitude toward reading and higher literacy growth were seen for students who came in with good attitude and strong reading comprehension skills; improvement and growth were also related to amount of reading, both assigned and independent, done during college. In addition, they found gender differences, with males who came in to college with a high level of reading comprehension and positive attitude toward reading tended to benefit the most. How good readers who are male may differ from those who are female, and how their experience as readers at the college level may be different is an important and interesting question remaining to be addressed. Consideration of students’ goal orientations would be a useful additional piece of information here, along with perhaps more qualitative interview-based exploration of their views of what reading is.

The identified difficulty of some of the male non-book readers with the task of reading aloud supports the finding by Werde (2005) that difficulties with decoding and associated
problems with word recognition can persist into college, with significantly more miscues when reading connecting text produced by her undergraduate participants with identified reading disabilities prior to college. Such difficulties are likely to interfere with students’ comprehension, and certain contribute to making reading more effortful and painful for them. Paradoxically, one of the possible ways to address this could be to have such students do more reading of books. Paulson (2006) suggests that increased engagement in self-selected reading of books for enjoyment could be a more effective intervention for college-level developmental readers than drills or worksheets, with such reading likely to change students’ views of reading as a chore and a task, to change their views of themselves as readers, and to help to change their reading habits and enjoyment of reading.

Beyond students’ views of themselves as readers, another aspect of identity associated with reading and reading habits is the importance of reading as a vehicle for students’ exploration of possible selves and identities (Richardson & Eccles, 2007). Students who do not choose to read books, or who view reading from strictly a utilitarian standpoint, that is, as a means to accomplish a specific and immediate task, as in the male non-fiction reading subtype identified by Manzo et al. (2000) or as an escape from reality, as in the female story reading subtype, are likely to be limited in their self-development.

Further investigation of gender and of undergraduate leisure reading habits in terms of both frequency and type of reading material as related to performance at school-related reading tasks should address both larger samples and more fine-grained and possibly ethnographic perspectives, looking at how being a male or a female operates at the intersection of being a reader and being a college student. The importance of both motivational and cognitive variables in reading performance suggests that attention to such ecological factors as reading habits that
are likely to impinge on both types of variables would be profitable. This investigation also suggests that the recent focus of attention on adolescent readers needs to be broadened to include attention to what happens as they move on to young adulthood and college. Just as we cannot assume that learning to decode will ensure competent reading, we equally cannot assume that being in college implies being a college-level reader.
References

ACT (2006). *Reading between the lines: What the ACT reveals about college readiness in reading*. Iowa City, IA: ACT.


Table 1. Reported Reading Frequency and Materials for Total Sample and by Gender

<table>
<thead>
<tr>
<th>Reading Frequency</th>
<th>Total (% of total)</th>
<th>Males (% of males)</th>
<th>Females (% of females)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>23 (38%)</td>
<td>12 (43%)</td>
<td>11 (34%)</td>
</tr>
<tr>
<td>Occasionally / Regularly</td>
<td>18 (30%)</td>
<td>7 (25%)</td>
<td>11 (34%)</td>
</tr>
<tr>
<td>School Breaks</td>
<td>8 (13%)</td>
<td>1 (4%)</td>
<td>7 (22%)</td>
</tr>
<tr>
<td>Rarely / Never</td>
<td>11 (18%)</td>
<td>8 (29%)</td>
<td>3 (9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading Material</th>
<th>Total (% of total)</th>
<th>Males (% of males)</th>
<th>Females (% of females)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>39 (65%)</td>
<td>12 (43%)**</td>
<td>27 (84%)**</td>
</tr>
<tr>
<td>Magazines</td>
<td>23 (38%)</td>
<td>10 (36%)</td>
<td>13 (41%)</td>
</tr>
<tr>
<td>Newspapers</td>
<td>21 (35%)</td>
<td>12 (43%)</td>
<td>9 (28%)</td>
</tr>
<tr>
<td>Online</td>
<td>15 (25%)</td>
<td>11 (39%)</td>
<td>4 (12%)</td>
</tr>
<tr>
<td>Other*</td>
<td>2 (3%)</td>
<td>1 (4%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>None</td>
<td>2 (3%)</td>
<td>2 (7%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

a. Other reading materials were work manuals and comic books/manga.

** statistically significant difference, p < .01
<table>
<thead>
<tr>
<th></th>
<th>Females Book Readers (n = 27)</th>
<th>Females Non-Book Readers (n = 5)</th>
<th>Males Book Readers (n = 12)</th>
<th>Males Non-Book Readers (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GPA</strong></td>
<td>3.16 (.54)^a</td>
<td>3.04 (.64)</td>
<td>2.69 (.41)</td>
<td>2.88 (.53)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>20.74 (1.16)</td>
<td>21.00 (1.58)</td>
<td>20.58 (1.16)</td>
<td>21.56 (2.45)</td>
</tr>
<tr>
<td><strong>NFC</strong></td>
<td>64.44 (9.48)</td>
<td>60.00 (10.56)</td>
<td>58.18 (8.38)^a</td>
<td>59.00 (11.35)</td>
</tr>
<tr>
<td><strong>Cumulative Credits</strong></td>
<td>80.11 (26.82)</td>
<td>97.20 (20.66)</td>
<td>68.92 (26.26)</td>
<td>80.00 (23.54)^a</td>
</tr>
</tbody>
</table>

**Scientific Approach Passage**

<table>
<thead>
<tr>
<th></th>
<th>Females Book Readers (n = 27)</th>
<th>Females Non-Book Readers (n = 5)</th>
<th>Males Book Readers (n = 12)</th>
<th>Males Non-Book Readers (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interest</strong></td>
<td>2.78 (.97)</td>
<td>3.20 (.84)</td>
<td>2.58 (1.00)</td>
<td>3.06 (1.18)</td>
</tr>
<tr>
<td><strong>Topic Knowledge</strong></td>
<td>6.44 (2.21)</td>
<td>7.40 (2.07)</td>
<td>6.83 (1.90)</td>
<td>6.44 (1.59)</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td><strong>1.63 (1.39)</strong></td>
<td><strong>2.80 (1.92)</strong></td>
<td><strong>1.58 (1.78)</strong></td>
<td><strong>1.06 (1.18)</strong></td>
</tr>
</tbody>
</table>

**Statistical Inference Passage**

<table>
<thead>
<tr>
<th></th>
<th>Females Book Readers (n = 27)</th>
<th>Females Non-Book Readers (n = 5)</th>
<th>Males Book Readers (n = 12)</th>
<th>Males Non-Book Readers (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interest</strong></td>
<td>2.52 (1.50)</td>
<td>2.80 (1.48)</td>
<td>3.00 (1.10)^a</td>
<td>3.50 (1.10)</td>
</tr>
<tr>
<td><strong>Topic Knowledge</strong></td>
<td>4.63 (1.60)</td>
<td>4.80 (2.39)</td>
<td>4.08 (1.16)</td>
<td>4.50 (1.03)</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td><strong>.70 (1.20)</strong></td>
<td><strong>1.40 (1.14)</strong></td>
<td><strong>1.17 (1.19)</strong>*</td>
<td><strong>.31 (.79)</strong>*</td>
</tr>
</tbody>
</table>

a. n is one less than total given in heading.
* statistically significant difference, p < .05
Table 3
Codes for Think-Alouds

*Strategic behaviors*

- Reading aloud
- Re-reading
- Adjusting reading rate when re-reading – speeding up or slowing down
- Skimming (reading aloud while skipping portions)
- Guessing the meaning of a word in context [“Erroneous I think means things that are not necessarily factual.”]
- Predicting [“Okay, now it’s going to summarize that.”] **DEEP**
- Questioning [“What would happen if you do it either direction?”] **DEEP**
- Arguing with text [“it also, it really depends on your knowledge of the subject, ‘cause if you don’t know much about it, it won’t seem vague or improbable evidence.”] **DEEP**
- Underlining or other marking on the text [“Underlining intuition and authority.”]
- Using text feature [“I’m looking for it in the table.”]
- Rehearsing (repeating information to maintain it in memory) [“So that’s type one error. Type two. Okay. Type one, type two.”]
- Restating (paraphrase) or repeating text information
  - local (word, phrase, sentence level) [“So significance level can increase or decrease the type one error.”]
  - global (paragraph, passage level) [“So basically it introduces about, um, how the scientific approach differs from just, uh, intuition and authority.”] **DEEP**
- Making connections
to background knowledge [“We learned about peer review in class, it’s when other people kind of look at your results and confirm it.”]

to personal experience [“That happened to my sister.”]

to prior text [“Intuition and authority are the things I just read about.”]

to topic knowledge test [“This probably relates to scientific skepticism, which was the thing, a question on one of those tests I just took.”]

to research task [“I’m not gonna have much to write about this.”]

• Interpreting (a statement requiring reasoning beyond information in the text to build text meaning) [“So, that’s just talking about the confidence interval.”] DEEP

• Elaborating (a statement requiring the use of additional information not explicitly in the text to build beyond text meaning or pursue a non-text related train of thought) [“what if, um, what if that one person just, like, stole a biscuit or something.”] DEEP

Monitoring/Evaluative behaviors

• Evaluating comprehension (positive or negative) [“I’m already confused by this passage.”]

• Evaluating agreement with text (positive or negative) [“That’s definitely true.”]

• Evaluating text quality [“That’s a good way to describe it.”]

• Evaluation of interest (positive or negative) [“The first part was kind of interesting.”]

• Evaluation of importance of text [“I feel like that’s important, with the, to know for later on this semester.”]

• Evaluation of task difficulty [“In order for me to really realize what is going on here, I would have to sit down and study this stuff.”]

• Monitoring task completion status [“Okay, I’m done.”]