The purpose of this study is to examine the relationship between the variables of reading motivation, reading amount, and text comprehension in deaf and hearing adults. Research has shown that less than 50% of deaf students leave high school reading at or above a fourth-grade level (Allen, 1994). Our question is, how does this affect the levels of reading motivation and amount of reading in which deaf adults engage? Assessments of 30 hearing and 24 deaf adults showed that deaf participants reported significantly higher levels of reading motivation despite having been found to read at less than a sixth-grade level. No significant difference in the amount of reading between hearing and deaf adults was found. Amount of reading for personal reasons was found to be the best predictor of text comprehension in the deaf participants, and intrinsic motivation was found to be the best predictor of amount of reading in the deaf participants.

Over the past few decades, research in the area of motivation has increased greatly and researchers have become interested in examining the construct of motivation within specific domains. One domain that has gained increasing interest is that of reading motivation. Despite the complexity of defining a construct like motivation, most researchers agree that motivation is multidimensional. One commonly accepted definition is that motivation is a “multifaceted set of goals and beliefs that guide behavior” (Guthrie & Wigfield, 1999, p. 199). Thus, reading motivation would be the set of goals and beliefs that guide behavior in regards to reading.

Given the importance of reading in our society and the increasing demands for higher literacy rates, researchers have begun to examine the construct of reading motivation and how it relates to amount of reading and reading achievement. To date, however, research of this type has examined mainly hearing participants. With less than 50% of 17- to 21-year-old deaf students leaving secondary school in the U.S. reading at or above a fourth-grade level (Allen, 1994), understanding the link between reading motivation, reading amount, and reading achievement in deaf readers is also important. Indeed, Paul (2003, p. 106) states that when it comes to research on the deaf “one of the most neglected areas relating to reading is the affective domain (i.e., motivation, interest), … Researchers should examine the relationships between motivation and interest and comprehension of texts.”

Examining the link between reading motivation and reading comprehension in deaf readers seems particularly important as learning to read seems to be much more difficult for children who are deaf. Many factors contribute to this difficulty (see Musselman, 2000), one of which is the extreme limitation in reception of spoken language that restricts learning of an oral language in those who are deaf. As text is a written form of what is spoken orally, mastery of reading is more difficult for those who naturally cannot hear the sounds of language. For example, in an alphabetic
writing system like English, written letters or letter combinations correspond to sounds in oral language. When beginning the task of learning to read, hearing children start with a preexisting oral vocabulary. Their job as emergent readers is to learn which letters correspond to the sounds they are already using in their oral language. Once this knowledge is obtained, it can be used to decode words into their corresponding oral sounds. Once a written word has been decoded, hearing children can access their preexisting oral knowledge for that word and gain access to the meaning of the word. As suggested by Juel (2006, p. 423) “phonics works only if the string of produced letter sounds approximates a recognizable word.” As deaf children do not have access to oral sounds the way hearing children do, the relationship between their face-to-face language (signed or oral) and text differs from that of hearing children (Mayer, 2007). Thus, learning the link between letters and sounds is more difficult for deaf children and puts them at-risk for reading failure.

Research by Morgan, Fuchs, Compton, Cordray, and Fuchs (2008) found that first-grade children who experience early and consistent reading failure had lower levels of reading motivation, saw themselves as less competent readers, and had more negative attitudes toward reading than children who experience early success in reading. Teachers in the study by Morgan et al. also reported that these children read less frequently and were more likely to engage in task avoidant behaviors during reading instruction, and these findings were stable throughout the 4-year duration of the study. Indeed, Gottfried, Fleming, and Gottfried (2001) found that general academic achievement motivation levels remain relatively stable from childhood through high school with a slight decrease in reading specific motivation from ages 9 through 17 years. Given the inherent difficulty, deaf children have learning to read, and the influence early reading failure has on reading motivation for years to come, reading motivation in deaf readers and its relationship to reading achievement, as well as reading amount is an area in need of research.

Reading Motivation

Given the multidimensional view of the general construct of motivation, those examining the domain-specific construct of reading motivation have taken a multidimensional view as well. Wigfield and Guthrie (1997) set forth 11 dimensions of motivation specific to the domain of reading, and Wigfield, Guthrie, and McGough (1996) developed the 54-item Motivation for Reading Questionnaire (MRQ) to examine these dimensions. These 11 dimensions include: efficacy, challenge, work avoidance, curiosity, involvement, social, recognition, grades, competition, compliance, and importance. Although questions have been raised about the factor structure of the MRQ (Watkins & Coffey, 2004), several studies examining hearing participants have supported these 11 dimensions (Baker & Wigfield, 1999; Unrau & Schlackman, 2006; Wigfield & Guthrie, 1997). Given this and the fact that these 11 dimensions are grounded in previous theoretical work in the field of motivation, this research will examine all 11 dimensions of reading motivation.

The first dimension of reading motivation, efficacy, is related to the general motivation construct of self-efficacy. Self-efficacy is a person’s belief in their capacity to organize and execute actions (Bandura, 1986). Thus, reading efficacy is the belief one has in their ability to be successful at reading. Self-efficacy is important because “compared with students who doubt their learning capabilities, those who feel efficacious for learning or performing a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level,” (Schunk, 2003, p. 161).

The idea of task difficulty is one we find to be of particular relevance to deaf readers as the task of learning to read seems to be more difficult than for those who can hear. Task difficulty is examined by the reading motivation dimension of challenge. The dimension of challenge is based in the idea that a reader can get satisfaction from mastering complex ideas presented in text. Success at a challenging task can lead to an increase in self-efficacy (Bandura, 1997; Schunk, 1983). However, being asked to perform tasks that are viewed as very difficult can lead to lower expectations of success and lower levels of self-efficacy (Stipek, 1996). Thus, the heightened level of challenge reading presents to deaf children could lead to decreases in reading motivation and self-efficacy beliefs. Further, decreases in self-efficacy beliefs are
related to another dimension of reading motivation, work avoidance (Baker & Wigfield, 1999). Work avoidance is related to students’ dislike of aspects of the reading task and avoidance of the task. Avoidance of reading leads to fewer opportunities to increase reading skill. Together, this suggests an increased potential for a cycle of failure and avoidance in deaf children learning to read.

Another dimension of reading motivation, curiosity is seen as reading out of the desire to learn about a topic of personal interest. The dimension of involvement is the enjoyment one receives from reading different types of text. These two dimensions of reading motivation combined with the challenge dimension are forms of intrinsic motivation (Unrau & Schlackman, 2006; Wang & Guthrie, 2004). Intrinsic motivation comes from a person’s interest, beliefs and value of a task, or doing an activity for its own sake. Intrinsic motivation has been found to be positively correlated with students’ grades in school and scores on standardized tests (Boggiano, 1998; Corpus, McClintic-Gilbert, & Hayenga, 2009; Gottfried, 1985; Lepper, Corpus & Iyengar, 2005). Guthrie, Wigfield, Humenick, Perencevich, Taboada, and Barbosa (2006) found that intrinsic motivation combined with self-efficacy correlated with reading comprehension. In addition, readers with high intrinsic motivation achieve higher levels of conceptual understanding of text and are more interested in the material read (Benware & Deci, 1984). Intrinsic motivation has been associated with a learning goal orientation or mastery of learning material for its own sake (see Ames, 1992; Nicholls, Cheung, Lauer, & Patashnick, 1989). It has been argued that children with this orientation will be more likely to maintain positive motivation in school (see Ames, 1992), and mastery goals have also been associated with an increased persistence on difficult tasks (Elliott & Dweck, 1988).

The social dimension of reading motivation is important because reading is frequently a social activity. Children and adults read together and people often discuss what they read in everyday conversations. Thus, social motivation and social goals can play a part in reading motivation, and social aspects of the classroom such as individualism, competition, or cooperation can influence relationships among students (Ames, 1984; Wentzel, 1996). This dimension of reading motivation as well as the dimensions of recognition, reading to receive recognition of success, grades, reading to receive a positive evaluation from the teacher, competition, reading out of the desire to outperform other students, and compliance, reading due to an external goal or requirement, are all extrinsic types of motivation (Unrau & Schlackman, 2006; Wang & Guthrie, 2004). In contrast to intrinsic motivation, extrinsic motivation comes from an external source such as rewards. Extrinsic motivation has historically been viewed as negative as it is correlated with lower levels of academic achievement (Corpus et al., 2009; Lepper et al., 2005) and a performance goal orientation. Performance goal-oriented individuals seek to gain positive judgments of their ability (see Ames, 1992). Students with this orientation avoid challenging tasks, have a failure-avoidance pattern of motivation, and focus on ability more than effort (Dweck, 1986; Dweck & Leggett, 1988; Elliott & Dweck, 1988). However, Harackiewicz, Barron, and Elliot (1998) found that a performance goal orientation can be positively related to performance in college students.

The last dimension of reading motivation proposed by Wigfield and Guthrie (1997) is importance. This dimension is one’s sense that reading is of central importance to who they are. In general, all the dimensions are closely related, and it is believed that there is a great deal of overlap between them and that students are not motivated by just one dimension but a combination of them (Wigfield, 1997). Thus, a change in one aspect of the student’s life may have a large impact on several of the categories or dimensions.

Linking Reading Motivation, Amount of Reading, and Text Comprehension

Using this multidimensional view of reading, motivation researchers have examined the link between reading motivation, amount of reading, and reading comprehension in hearing students, with varying results. Several studies have found a link between reading motivation and text comprehension in the United States (Guthrie et al., 2006; Wang & Guthrie, 2004) and Chinese students (Law, 2009; Wang & Guthrie, 2004). Guthrie, Wigfield, Metsala, and Cox
(1999) found this link when examining tenth graders but not when examining third and fifth graders. Baker and Wigfield (1999) found only certain dimensions of reading motivation (e.g., challenge, work avoidance, and involvement in reading) to be correlated with text comprehension; other dimensions (e.g., social reasons for reading, importance of reading, and reading for competition) were not found to correlate with text comprehension. Finally, Wigfield et al. (2008) found no correlation between motivation and reading comprehension. Thus, the link between reading motivation and text comprehension has not been shown consistently in the literature.

More consistent links between reading motivation and amount of reading and between amount of reading and text comprehension have been found. Several studies have found a link between reading motivation and reading amount. Baker and Wigfield (1999) found that all 11 dimensions of reading motivation were correlated with reports of children’s reading activity levels. Guthrie et al. (1999) found that reading motivation was a significant predictor of reading amount. Schutte and Malouff (2004) found that reading motivation was correlated with university students overall frequency of reading, hours spent in recreational reading, and hours spent in required reading. Although Wigfield and Guthrie (1997) found a link between intrinsic motivation, reading amount, and breadth of reading, others have found a link between reading amount and reading comprehension (Anderson, Wilson, & Fielding, 1988; Cipielewski & Stanovitch, 1992). Logan and Johnston (2009) found that reading ability, which included not only comprehension but also word reading and vocabulary, was correlated with reading frequency. Guthrie et al. (1999) found aspects of reading motivation predicted amount of reading and amount of reading predicted text comprehension with 3rd-, 5th-, and 10th-grade students.

The constancy of the findings linking reading motivation and amount of reading and those linking amount of reading and text comprehension through several early studies led researchers to hypothesize that reading motivation mediates the link between reading amount and reading comprehension (Wigfield & Guthrie, 1997). Guthrie et al. (1999) proposed that reading motivation increases reading amount, which in turn increases reading comprehension. However, Wang and Guthrie (2004) found that after controlling for motivational variables, amount of reading did not predict text comprehension. In a more recent examination of this link, Leppänen, Aunola, and Nurmi (2005) used path analysis and found that for Finnish children just beginning to read reading skills such as sentence comprehension and text reading ability contributed to reading habits outside school instead of visa versa. Thus, it may not be that reading amount increases reading comprehension but that early reading comprehension increases reading amount.

In all, the link between these three variables in hearing students remains in question. As such, the goal of this research is not to directly compare the relationship between reading motivation, amount of reading, and reading comprehension in deaf students with a known structural link between these variables in hearing students. Instead, this research aims to examine the link between reading motivation, amount of reading, and text comprehension in deaf students as it is believed that the challenge learning to read poses for these students will result in an increased need for higher levels of reading motivation. A group of hearing students was examined in this study to determine average levels of reading motivation and reading amount in a population for whom learning to read was likely not as challenging. In addition, due to the unstable nature of this relationship found in previous literature on hearing children, it was determined that examining this relationship at the end of a student’s educational career (i.e., the college years) was preferable as it is likely that reading achievement levels are more stable. In addition, the research by Gottfried et al. (2001) suggests that levels of academic motivation are stable from childhood through late adolescence with only a slight decline in motivation specific to the area of reading. Participants’ enrollment in college courses makes reading for school a necessity and, thus, still allows for the examination of reading amount for both scholastic and personal reasons.

**Methods**

**Participants**

Advertisements for this study were posted throughout a university in the mid-Atlantic region of the United
States and yielded 24 deaf and hard-of-hearing adult respondents. Of these 24 respondents, 19 were deaf and 5 were hard of hearing. While in most cases, hard-of-hearing participants are distinguished from those who are deaf; independent sample t test analyses revealed no significant differences between deaf and hard-of-hearing participants on reading comprehension, amount of reading, and reading motivation variables. Thus, for the purposes of this research, all analyses grouped the deaf and hard-of-hearing participants together.

Of the 24 respondents, 10 were male and 14 were female. Two had graduated from college and were not currently enrolled in courses. These two respondents were used as participants but removed from analyses examining reading for school purposes. Nineteen respondents were college undergraduates primarily at the junior (n = 8) and senior level (n = 7), with the exception of three sophomores and one freshman. The remaining three respondents were graduate students at the time of data collection. All but three of the deaf participants were born to hearing parents. Participants used various methods of communication (eight American Sign Language, four Oral English, six a mix of sign and English, two a mix of American Sign Language and Pigeon Sign English, one a mix of Cued Speech and American Sign Language, one a mix of American Sign Language and Signed Exact English, one Sign Exact English, and one Cued Speech). The majority of the deaf participants were educated in mainstream schools (n = 14; n = 7 residential schools for the deaf; n = 1 day school; data missing for two participants). All deaf participants received $10 for their participation in this study.

In addition to the 24 deaf participants, a group of 30 hearing adults (11 male, 19 female) also participated in this study. These participants were recruited from a university in the mid-Atlantic region of the United States and were all enrolled in a 400-level education class. These participants were primarily juniors and seniors with the exception of one freshman. Hearing participants received extra credit for their participation in this study.

Measures

Each participant in this study completed the MRQ (Wigfield et al., 1996) and a Reading Activity Questionnaire. Participants also completed the Gray Silent Reading Test (GSRT; Wiederholt & Blalock, 2000) and a demographic questionnaire.

The MRQ. The original version of the MRQ (Wigfield et al., 1996) measures the 11 dimensions of reading motivation by Wigfield and Guthrie (1997) in late elementary or middle school-aged children. The newly adapted adult version of the MRQ examines only 10 of these dimensions. The grades dimension was eliminated as adult college students no longer take reading classes for a grade. All other dimensions were deemed appropriate as these adults do still read for school-related reasons as well as for personal reasons. The MRQ questions for the 10 remaining dimensions were adapted for our study by making changes to the language of the items so that they were more appropriate for college students. For example, where the word “teacher” was used in the original version of the MRQ, the word “professor” was used in its place. Other changes included adding items that reflect more adult reading activities including: buying books, trying to be “well read,” reading books on bestseller lists, displaying books in the home, going to bookstores, reading at coffee shops, and being a member of a book club. See Appendix A for all MRQ questions used in this study. The adapted version of the MRQ maintained the use of the four-point Likert scale used in the original version to assess participants’ attitudes toward reading. The choices on this scale range from 1, “very different from me,” to 4, “a lot like me.”

The first author, an experienced psychometrician, performed all changes to the MRQ. The second author, at the time herself an undergraduate college student, examined all changes for appropriateness for use with her peers, and her feedback was integrated into the final version of the scale. Lastly, one of the original creators of the MRQ examined the adapted version of the scale, and his feedback was integrated into the final version of the adult-adapted scale.

Table 1 lists the internal consistency reliabilities for all 10 MRQ dimensions for both the hearing and deaf participant groups. Many of the dimensions reach acceptable reliability levels of above .70 for both participant groups. For the deaf participant group, the dimensions of challenge and work avoidance are
between .60 and .70 as are curiosity for the hearing group and efficacy for both groups. The dimensions of curiosity and involvement in the deaf participant group are somewhat lower but still above .50. The reliability rates of the compliance and recognition dimensions, however, are far below the acceptable range when examined in the deaf participant group. Given such low reliability rates, we cannot be confident in the accuracy or consistency of these scores, and as such, these two dimensions of reading motivation were removed from all analyses.

Composites for the adapted adult version of the MRQ include a total reading motivation scores obtained by summing 7 of the 10 MRQ dimension subscales. The compliance and recognition dimensions were not included given their low reliability rates, and reading avoidance was not included as it measures a negative aspect of reading motivation, and all other subscales measure positive aspects of motivation. The dimensions of curiosity, involvement, and challenge were combined to form the intrinsic motivation composite (Unrau & Schlackman, 2006; Wang & Guthrie, 2004).

*Reading Activity Questionnaire.* The Reading Activity Questionnaire used in the current study was based on the Reading Activity Inventory by Guthrie, McGough, and Wigfield (1994), which contains general questions about participants reading activity for both school and personal enjoyment. The Reading Activity Inventory contains questions about subject-specific school reading and subject-specific reading for enjoyment with questions such as “how often do you read a science book or science textbook for school?” As college students make their own class schedules, they are not guaranteed to be enrolled in any specific classes as such these subject-specific questions are not appropriate for this population. Instead, the Reading Activity Questionnaire used in the current study contains general questions about reading activity such as “how many times did you read for class last week?” and “please estimate the number of hours you read last week” (for school). Schutte and Malouff (2004) found a significant correlation between these types of reading activity estimates and daily logs of reading activity. In addition, participants were asked to provide the names of books, topics they read about, and the classes for which they read. In order to maintain consistency in the scale, these same general questions were asked about reading for personal enjoyment. Lastly, a checklist of 17 different types of reading materials was included in the questionnaire to measure the range of material types participants read for personal enjoyment. The composite scores for this measure included reading for school and personal reading, each includes the respective questions on number of reading episodes, hours spent reading, and books read. Participants’ total reading score include these two composites and number of material types checked off. See Appendix B for a copy of this measure. Internal consistency reliabilities for this measure are included in Table 1.

<table>
<thead>
<tr>
<th>Measure subscale</th>
<th>Deaf participants</th>
<th>Hearing participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation for Reading Questionnaire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge</td>
<td>.67</td>
<td>.87</td>
</tr>
<tr>
<td>Competition</td>
<td>.76</td>
<td>.81</td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td><strong>.07</strong></td>
<td><strong>.79</strong></td>
</tr>
<tr>
<td>Curious</td>
<td>.55</td>
<td>.66</td>
</tr>
<tr>
<td>Efficacy</td>
<td>.68</td>
<td>.65</td>
</tr>
<tr>
<td>Importance</td>
<td>.83</td>
<td>.83</td>
</tr>
<tr>
<td>Involvement</td>
<td>.57</td>
<td>.79</td>
</tr>
<tr>
<td><strong>Recognition</strong></td>
<td><strong>.12</strong></td>
<td><strong>.42</strong></td>
</tr>
<tr>
<td>Social reasons</td>
<td>.86</td>
<td>.92</td>
</tr>
<tr>
<td>Work avoidance</td>
<td>.62</td>
<td>.79</td>
</tr>
<tr>
<td>Intrinsic</td>
<td>.77</td>
<td>.88</td>
</tr>
<tr>
<td>Total</td>
<td>.93</td>
<td>.95</td>
</tr>
<tr>
<td>Reading Activity Questionnaire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>.58</td>
<td>.77</td>
</tr>
<tr>
<td>School</td>
<td>.68</td>
<td>.57</td>
</tr>
<tr>
<td>Total</td>
<td>.43</td>
<td>.73</td>
</tr>
<tr>
<td>GSRT</td>
<td>.96</td>
<td>.76</td>
</tr>
</tbody>
</table>

*Note.* Items in bold displayed unacceptable reliability rates and as such were removed from analyses.

The *GSRT.* In addition to the MRQ and Reading Activity Questionnaire, all participants completed the GSRT. The GSRT is a nationally standardized test of silent reading ability for use with persons aged 7–25 years. For this assessment, participants read anywhere from 1 to 13 developmentally sequenced reading passages depending on their beginning and ending reading levels. Each passage is followed by five multiple-choice questions examining comprehension of the passage. The GSRT provides scores in the form of
a Silent Reading Quotient (SRQ), percentile rank, grade equivalent, and age equivalent. For the purposes of this paper, all analyses used the SRQ. Using a normative sample of 1,400 participants, this test has been found to be a valid measure of silent reading comprehension (see Wiederholt & Blalock, 2000). Wiederholt and Blalock describe the disability status of this norming sample as 89%–90% “no disability,” 5%–6% “learning disability,” 1%–3% “speed-language disorder,” and 1%–3% “other handicap” (p. 43). Thus, these norms are based primarily on a hearing sample. No norms for a deaf sample are available. Reliability rates for the GSRT for the sample used in the current research are included in Table 1.

Procedure

Data collection was implemented in a small group format of 5–10 for the deaf participants, and a sign language interpreter was used during data collection to interpret all verbal instructions given by the experimenter. Data collection for the hearing participants was completed in a large group format of 15–20 participants. All participants were given the MRQ, GSRT, Reading Activity Questionnaire, and a demographic questionnaire. All measures were administered in a counterbalanced order between testing groups.

Results

Table 2 presents descriptive statistics for the GSRT and reveals that deaf participants in this study were reading on average at less than a sixth-grade level. Table 3 presents the descriptive and inferential statistics for the MRQ and shows that despite these low reading levels, the deaf participants rated themselves significantly higher than the hearing participants on the reading motivation dimensions of challenge, curiosity, efficacy, and involvement. In addition, they rated themselves as higher in intrinsic motivation and overall levels of reading motivation. They also rated themselves moderately higher on the dimension of importance. This difference in levels of motivation, however, did not influence reading amount. Table 4 shows that the measures of reading amount did not differing significantly between deaf and hearing participants, with the exception of a moderate difference in the range of reading materials participants reported enjoying.

Table 5 presents the correlations between the variables of text comprehension, reading amount, MRQ dimension subscales, MRQ intrinsic motivation composite, and the MRQ scale total. This table shows that text comprehension was found to be positively related to amount of reading for personal enjoyment, and the reading motivation dimensions of challenge and competition in the deaf participants and marginally correlated with overall reading motivation levels. This table also shows that text comprehension was positively correlated with reading efficacy, as well as the challenge, importance, and social dimension of reading in the hearing participants. In addition, text comprehension was negatively correlated with work avoidance and positively correlated with the intrinsic motivation composite and the total reading motivation composite.

In regards to amount of reading, Table 5 shows that for the deaf participants’ amount of reading for school purposes was positively correlated with involvement, moderately correlated with intrinsic motivation.
and total motivation, and negatively correlated with work avoidance. For the hearing participants, amount of reading for school purposes was positively correlated with the reading motivation dimensions of challenge, curiosity, involvement, importance, social reasons for reading, intrinsic motivation, and total reading motivation. Amount of reading was also moderately correlated with reading efficacy and competition and negatively correlated with work avoidance.

Amount of reading for personal enjoyment in the deaf participants was positively correlated with the reading motivation dimension of competition and with total reading motivation. It was moderately correlated with the dimensions of challenge and importance and with intrinsic motivation. For the hearing participants, amount of reading for personal enjoyment was positively correlated with the dimensions of curiosity, involvement, importance, social reasons for reading, intrinsic motivation, and total reading motivation. In addition, it was moderately correlated with the dimension of challenge.

In regards to total reading amount, Table 5 shows that for the deaf participants, total reading amount was positively correlated with the reading motivation dimensions of challenge, curiosity, involvement, importance, competition, as well as intrinsic motivation and total motivation. For the hearing participants, total reading amount was positively correlated with the reading motivation dimensions of efficacy, challenge, curiosity, involvement, importance, and social reasons; intrinsic motivation; and total motivation and negatively correlated with work avoidance.

Table 5 also shows that there are significant correlations between gender and the reading motivation dimensions of efficacy, challenge, social, and total motivation for the deaf participants. However, there were no significant correlations between gender and reading motivation in the hearing participants.

### Predictors of Text Comprehension

To further examine the relationship between reading motivation, amount of reading, and text comprehension, we used multiple regression to examine the best predictors of text comprehension and reading amount for both participant groups. To examine predictors of text comprehension, participants’ scores on the GSRT were used as the dependent variable. The independent motivational variables included any MRQ dimension or composite score found to be correlated with the GSRT for the particular participant group being

#### Table 3  Analysis of motivation for reading questionnaire

<table>
<thead>
<tr>
<th>MRQ subscale</th>
<th>Deaf mean (SD)</th>
<th>Hearing mean (SD)</th>
<th>F statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge</td>
<td>3.18 (0.57)</td>
<td>2.77 (0.80)</td>
<td>F(1, 53) = 4.47*</td>
</tr>
<tr>
<td>Competition</td>
<td>2.62 (0.72)</td>
<td>2.55 (0.73)</td>
<td>F(1, 53) = 0.12</td>
</tr>
<tr>
<td>Curiosity</td>
<td>3.50 (0.47)</td>
<td>3.13 (0.61)</td>
<td>F(1, 53) = 6.12*</td>
</tr>
<tr>
<td>Efficacy</td>
<td>3.27 (0.61)</td>
<td>2.93 (0.52)</td>
<td>F(1, 53) = 4.87*</td>
</tr>
<tr>
<td>Importance</td>
<td>3.06 (0.81)</td>
<td>2.65 (0.82)</td>
<td>F(1, 53) = 3.40*</td>
</tr>
<tr>
<td>Involvement</td>
<td>3.17 (0.57)</td>
<td>2.66 (0.76)</td>
<td>F(1, 53) = 7.60**</td>
</tr>
<tr>
<td>Social reasons</td>
<td>2.68 (0.68)</td>
<td>2.56 (0.76)</td>
<td>F(1, 53) = 0.34</td>
</tr>
<tr>
<td>Work avoidance</td>
<td>2.20 (0.79)</td>
<td>2.33 (0.88)</td>
<td>F(1, 53) = 0.31</td>
</tr>
<tr>
<td>Intrinsic composite</td>
<td>52.42 (6.91)</td>
<td>45.43 (9.74)</td>
<td>F(1, 53) = 8.78**</td>
</tr>
<tr>
<td>Total motivation</td>
<td>109.58 (17.99)</td>
<td>97.70 (20.78)</td>
<td>F(1, 53) = 4.91*</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. *p < .10.

#### Table 4  Analysis of reading activity questionnaire

<table>
<thead>
<tr>
<th>Reading activity subscale</th>
<th>Deaf mean (SD)</th>
<th>Hearing mean (SD)</th>
<th>F statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading for school</td>
<td>10.02 (7.80)</td>
<td>11.87 (5.62)</td>
<td>F(1, 51) = 0.98</td>
</tr>
<tr>
<td>Reading personal</td>
<td>10.90 (8.55)</td>
<td>8.77 (7.87)</td>
<td>F(1, 53) = 0.90</td>
</tr>
<tr>
<td>Types of materials enjoy</td>
<td>7.50 (2.83)</td>
<td>5.93 (3.14)</td>
<td>F(1, 53) = 3.62a</td>
</tr>
<tr>
<td>Total reading activity</td>
<td>27.27 (11.35)</td>
<td>26.57 (12.64)</td>
<td>F(1, 51) = 0.17</td>
</tr>
</tbody>
</table>

*a p < .10.
The independent amount of reading variables included any reading activity variables found to be examined. The independent amount of reading variables included any reading activity variables found to be correlated with the GSRT for the participant group examined. The regression equation is then computed and tested for statistical significance. If the equation is not found to be significant, the process is concluded. If the equation is found to be significant, the partial correlation of each remaining predictor is used to add variables one at a time. This procedure was used in research examining the variables of reading motivation, amount of reading, and text comprehension conducted by Guthrie et al. (1999), who state that their rationale for choosing this method was the fact that they "did not possess a theory to inform the sequence of entry for the variables." (p. 242). Due to the inconsistent nature of the findings of previous work on the relationship between reading motivation, text comprehension, and amount of reading, we also did not possess a prior theory to inform the sequence of entry for the variables and felt it necessary to use procedures similar to those of others who have examined these variables to allow for consistency in the research.

The results of these analyses revealed only one significant predictor of text comprehension for each participant group. The variable of reading for personal enjoyment for the deaf participants resulted in a multiple correlation of .49, with a squared multiple correlation of .24, and an adjusted \( R^2 \) of .21. The beta was .49 (\( p < .05 \)). The adjusted \( R^2 \) of .21 was significant, indicating that the independent amount of reading variables included any reading activity variables found to be correlated with the GSRT for the participant group examined.

### Table 5  Intercorrelations among the primary variables for deaf and hearing adults

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<tr>
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</table>

Note: Correlations for deaf participants are in the upper right section. Correlations for the hearing participants are in the lower left section. Gender was coded 1 = male and 2 = female.

* \( p < .05 \), ** \( p < .01 \), a \( p < .10 \).
dependent variable. The independent motivational variables included any MRQ dimension or composite found to be correlated with total reading amount for particular participant group being examined.

The results of these analyses revealed only one significant predictor of overall reading amount for each participant group. The variable of intrinsic motivation for the deaf participants resulted in a multiple correlation of .63, with a squared multiple correlation of .39, and an adjusted $R^2$ of .36. The beta was .63 ($p < .01$), $F(1, 21) = 12.96$, $p < .01$. The MRQ dimension of social motivation for the hearing participants resulted in a multiple correlation of .75, with a squared multiple correlation of .56, and an adjusted $R^2$ of .55. The beta was .75 ($p < .01$), $F(1, 29) = 36.24$, $p < .01$

Analyses of Deaf Participants Based on Gender

Given the correlations shown in Table 5 between gender and several dimension of the MRQ in the deaf participants, a series of one-way analyses of variance were conducted to examine gender differences in reading motivation, amount of reading, and text comprehension in deaf participants. As can be seen in Table 6, deaf females’ scores on the reading motivation dimensions of challenge and social and their total reading motivation were significantly higher than that of deaf males. Deaf females’ scores were also moderately higher than males on the dimensions of efficacy and importance. There were no significant gender differences between males and females on either the text comprehension or amount of reading variables. In addition, there were no significant differences between hearing males and hearing females on any MRQ, text comprehension, or amount of reading variable.

Discussion

The low overall reading levels found for the deaf participants in this study were expected based on previous research on reading levels in deaf students. However, our finding that participants were reading slightly below a sixth-grade level is higher than the fourth-grade levels reported in Allen (1994) and Traxler (2000). This is likely due to the fact that the majority of our participants were college students with anywhere from 2 to 5 years of college education. Participants examined by Traxler were 18-year-old deaf students and those examined by Allen were 17–21 years of age leaving secondary school. Thus, at the time of testing, our deaf participants had attained a higher level of education than the students examined by Traxler and Allen. Accordingly, we make no claim that reading levels are rising in the deaf population. We can only say that in a sample of deaf adults, mainly college students, an above fifth-grade reading level was found.

We believe that the main finding of this research is that despite levels of text comprehension, well below grade level, deaf participants reported significantly higher levels of overall motivation for reading compared to hearing participants reading at grade level. In addition, they reported higher levels of motivation on specific dimensions of reading motivation, namely challenge, curiosity, efficacy, involvement, and intrinsic motivation. The finding that deaf participants reported higher levels of reading due to challenge suggests that they get more satisfaction than hearing participants mastering complex ideas in text. This is a very encouraging finding as the implications of previous motivational research suggested that the challenge reading presents to deaf students could lead to repeated failures lowering levels of reading motivation (Morgan et al., 2008) and self-efficacy for reading (Stipek, 1996) creating a potential cycle of failure and avoidance for deaf students learning to read. Instead, we find that deaf students are more motivated by challenge and have higher levels of reading efficacy than hearing students. Thus, our deaf participants had a greater belief in their ability to read. They also read

<table>
<thead>
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<th>MRQ subscale</th>
<th>Gender</th>
<th>Means (SD)</th>
<th>$F$ statistics</th>
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<td>Challenge</td>
<td>Male</td>
<td>2.86 (0.48)</td>
<td>$F(1, 22) = 6.01$*</td>
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<tr>
<td></td>
<td>Female</td>
<td>3.40 (0.55)</td>
<td>$F(1, 21) = 12.96$</td>
</tr>
<tr>
<td>Efficacy</td>
<td>Male</td>
<td>2.98 (0.56)</td>
<td>$F(1, 22) = 4.34$*</td>
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<td></td>
<td>Female</td>
<td>3.48 (0.59)</td>
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<td>Importance</td>
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<td>$F(1, 22) = 4.06$*</td>
</tr>
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<td></td>
<td>Female</td>
<td>3.33 (0.77)</td>
<td>$F(1, 21) = 4.06$</td>
</tr>
<tr>
<td>Social</td>
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<td>2.24 (0.56)</td>
<td>$F(1, 22) = 9.72$**</td>
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<td></td>
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<td>3.01 (0.60)</td>
<td>$F(1, 21) = 4.34$</td>
</tr>
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<td>Total MRQ</td>
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<td>$F(1, 22) = 5.03$*</td>
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<tr>
<td></td>
<td>Female</td>
<td>115.85 (17.47)</td>
<td>$F(1, 21) = 6.01$*</td>
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</table>

*p < .05. **p < .01. *p < .10.
more to satisfy curiosity, were more involved in the task of reading, and read more for internal reasons than hearing participants.

Reported levels of reading amount, however, did not differ between the two participant groups despite the higher reported levels of motivation in the deaf participants. Deaf participants reported only reading a slightly greater range of materials than the hearing participants. They did not report reading more for school or for personal reasons or reading more overall. Thus, despite reporting reading more for curiosity and for internal reasons and having a greater sense of their own ability to read, these deaf adults did not engage in more reading behavior. Given that reading motivation is defined as a set of goals and beliefs that guide behavior in regards to reading (Guthrie & Wigfield, 1999), this finding could lead one to question whether these higher reported levels of reading motivation were truly based on motivational constructs or whether they were the result of participants answering questions in ways they believed were socially appropriate.

We do not see socially appropriate item responding as completely explaining the higher levels of reading motivation reported by the deaf participants in this study for several reasons. First, despite much lower levels of reading comprehension in the deaf participants, both the deaf and hearing participants read similar amounts for school and personal reasons. Thus, it could be that given lower levels of text comprehension students need higher levels of reading motivation to engage in reading behavior at the same level as someone with higher levels of text comprehension.

In addition, the findings of the regression analysis show that for the deaf participants, amount of reading is the best predicted by intrinsic motivation. Thus, although deaf participants have higher motivation levels but do not read significantly more than hearing participants, within the deaf population, higher levels of internal motivation do predict higher levels of reading. One would not expect this finding had these higher levels of reading motivation been based solely on socially appropriate responding to MRQ items. As such, the remainder of this discussion will assume that the reported levels of reading motivation found in the deaf participants were accurate self-reports. Given this, the findings of the regression analyses suggest that the variables of reading motivation, amount of reading, and text comprehension are associated differently in the deaf and hearing participant groups. As such, we will examine the links between these three variables separately for both groups.

In relation to text comprehension, the results of our correlational analysis show that text comprehension in the deaf participants was associated with the reading motivation dimensions of challenge and competition and moderately associated with total reading motivation. In addition, text comprehension was associated with the variable of amount of reading for personal enjoyment. The association between text comprehension and challenge suggests that for deaf students those who persist despite the challenge reading may present are more likely to have increased reading comprehension levels. This is likely due to the fact that reading challenging material will lead to an increase in overall reading levels and those who choose to do so freely are more likely to increase their reading level than those who do not choose to do so. Indeed, Table 5 shows that the dimension of reading challenge is moderately negatively associated with the avoidance of reading in the deaf participant group. Thus, it seems that for deaf readers, persistence in the task of reading despite challenges is associated with less avoidance of reading and greater text comprehension.

The finding that the competition aspect of reading motivation is related to higher overall reading comprehension in the deaf participant group is consistent with the findings of Harackiewicz et al. (1998) who showed that for college-age students, a performance goal orientation is positively related to academic performance. Reading for competitive reasons is one type of performance goal orientation and is related to extrinsic motivation. Thus, it seems that for deaf college students, reading for extrinsic reasons such as competition is beneficial to their overall reading achievement.

The finding that text comprehension is correlated with the reading amount variable of personal enjoyment is consistent with the findings of our regression analysis which found that amount of reading for personal reasons was the best predictor of text comprehension in the deaf participants. In general, then, our research shows that deaf college students who read for personal enjoyment are motivated to read by challenge
and competition are more likely to have higher text comprehension levels.

In relation to text comprehension in the hearing participants, we found it to be positively associated with the reading motivation dimensions of challenge, efficacy, importance, and social reasons for reading. It was also correlated with intrinsic motivation and total motivation and negatively correlated with avoidance. Text comprehension in the hearing participants was not associated with any measures of reading activity. Given this and the findings of our regression analysis that reading efficacy was the best predictor of text comprehension in the hearing participants, we can conclude that hearing college students who have high levels of reading efficacy are motivated to read by challenge, believe reading to be of central importance to who they are, read for social reasons, are motivated to read for internal reasons, and do not avoid the task of reading are those with the highest levels of text comprehension.

In addition, the finding that text comprehension in the hearing participants was not associated with any measure of reading amount provides further evidence against the idea that reading motivation mediates the link between reading amount and reading comprehension (Guthrie et al., 1999; Wigfield & Guthrie, 1997), at least in hearing adults. In this study, however, this lack of a correlation may be due to the fact that we examined the relationship between these three variables at the end of students' educational careers, when reading achievement levels are stable, rather than during students' initial acquisition of reading skills.

In relation to amount of reading, we found more similarities between the deaf and hearing participant groups than when examining text comprehension. Table 5 shows that total reading amount was associated with many dimensions (challenge, curiosity, importance, and involvement) of reading motivation as well as intrinsic motivation and total motivation in both groups. Thus, for both hearing and deaf participants, students who were motivated by challenge, read out of curiosity, were involved in the task of reading and believed reading to be important to who they are read more overall. In addition, those who were motivated to read for internal reasons read more.

The two participant groups diverged, however, when it came to the dimension of efficacy, social reasons for reading, competition, and avoidance. For the hearing participants, efficacy and social reasons for reading were positively correlated with total reading amount and avoidance was negatively correlated with total reading amount. For the deaf participants, competition was positively correlated with total reading amount. This divergence between the groups continues when we examine the results of the regression which show that for the deaf participants intrinsic motivation is the best predictor of reading amount, but for the hearing participants social reasons for reading is the best predictor of reading amount.

When examining reading amount specifically for school and personal reasons, the groups again look different. All dimensions of reading motivation as well as intrinsic and total motivation were found to be at least moderately correlated with hearing participants’ reading for school reasons. For the deaf participants, this was only true for the dimensions of involvement and avoidance as well as intrinsic and total motivation. In regards to reading for personal reasons, the dimension of curiosity, involvement, importance, social reasons, intrinsic, and total motivation were correlated for the hearing participants. This was only true for competition and total motivation for the deaf participants. These findings suggest that for the deaf participants, higher levels of reading motivation are related to more engagement in the task of reading in general but not to domain-specific reasons for reading, suggesting a more generalized view of reading in the deaf participant group. Our current data does not allow us to speculate as to why these differences might have occurred or what these differences might mean. We believe this should be the subject of future research.

In all, our results are somewhat in line with that of the previous literature examining the links between reading motivation, amount of reading, and text comprehension in hearing students. Our most consistent link was between the variables of reading motivation and total amount of reading. We found this link in both deaf and hearing students. This finding is consistent with past research on hearing children (Baker & Wigfield, 1999; Guthrie et al., 1999; Wigfield & Guthrie, 1997) and hearing university students (Schutte & Malouff, 2004). However, Schutte and Malouff also found a link between hours spend in
required reading and reading motivation as well as between hours spent in recreational reading and reading motivation. We found these links for the hearing participants but not for the deaf participants. Past research also has found a fairly consistent link between text comprehension and reading amount (Anderson et al., 1988; Cipielewski & Stanovich, 1992; Guthrie et al., 1999), a link that we found in the deaf participant group when examining reading amount for personal reasons. We failed to find this link in the hearing participant group. Given this, future research should examine the links between reading motivation, reading amount, and text comprehension in deaf children learning to read to determine how the links between these variables develop and how they compare to hearing children learning to read.

Lastly, our analyses by gender showed that the deaf female participants were more motivated overall, and they were more likely to have higher self-efficacy beliefs, read for the challenge of the task, read for social reasons, and see reading as important than the male participants. Given the lack of a correlation between gender and any of these variables in the hearing participants, these findings are important for those who teach deaf students. These findings suggest that teachers need to bolster the support male deaf students receive in class in relation to reading motivation. In addition, these findings suggest that more research needs to be done on gender differences in levels of reading motivation in deaf readers, and studies need to be done to determine teaching methods that can be used to augment the reading motivation levels of deaf males.

To date, there are no fully developed interventions for improving the reading motivation levels of deaf children. However, teachers can follow a few simple guidelines to help foster their students’ motivation for reading. First, it is believed that learning material needs to be challenging yet still attainable to yield high levels of motivation from students, and this may be especially true in the case of deaf children and reading. Therefore, motivational researchers suggest that a moderate level of difficulty for assigned reading material is best (Schunk, 1983; Stipek, 1996). Gambrell and Morrow (1996) found that readers feel more self-confident when they succeed at reading moderately challenging material. Additionally, teachers should make sure reading materials are interesting to students, they should provide students with goals for reading, and they should support student autonomy and encourage social interactions among students around reading (Guthrie & Humenick, 2004). Lastly, research suggests that providing students with a choice of reading activities may enhance intrinsic motivation, effort, task performance, perceived competence, and lead to a preference for challenge (Patall, Cooper, & Robinson, 2008).

Limitations and Conclusion

Before concluding, we find it important to discuss the limitations of our study. First, our method of obtaining participants through advertisements on a college campus resulted in a relatively small sample size. A larger sample size would possibly have yielded different results and would have been more reliable. Despite our small sample size, we do see great value in the fact that our study is the first of its kind examining deaf participants. We hope that future research will continue to examine the links between these three variables in deaf students using more participants.

In all, we believe that the main finding of our study is that despite below-grade level text comprehension levels, deaf college students had higher levels of reading motivation than hearing college students. However, our study does suggest that within the deaf population, gender differences in levels of reading motivation are significant and that deaf males are less motivated to read than deaf females. It is our hope that this study draws attention to these gender differences and the association between text comprehension and reading motivation in deaf readers, and we hope that this study encourages future work exploring the links between text comprehension, reading motivation and amount of reading in deaf readers.

Appendix A

Motivations for Reading Questionnaire (Wigfield et al., 1996) with Items Organized by Dimension.

Challenge
I like hard, challenging books.
If the project is interesting, I can read difficult material.
I like it when the questions in books make me think.
I usually learn difficult things by reading.
If a book is interesting, I don’t care how hard it is to read.

*Competition*
I am willing to work hard to be better read than my friends.
I like to finish books before others.
I like being the only one who knows an answer in something we read in class.
*I like being a person others think is well read.
*I am willing to work hard to read better than my friends.

*Compliance*
I read because I have to.
I do as little of my assigned readings as possible.
I always do my readings exactly as the professor asks.
Finishing every reading assignment is very important to me.
I always try to finish my reading on time.

*Curiosity*
If the professor discusses something interesting, I might read more about it.
If I am reading about an interesting topic, I sometimes lose track of time.
I read to learn new information about topics that interest me.
I like to read about new things.
I enjoy reading books about people in different countries.

*Efficacy*
I am a good reader.
I learn more from class readings than most students in the class.
*I know I can read any book I want.
*I feel confident that I will be able to gather the needed information from class readings.

*Importance*
It is very important to me to be a good reader.
In comparison to other activities I do, it is very important to me to be a good reader.
*I buy a lot of books.
*It is very important to me to be well read.

*Involvement*
I read stories about fantasy and make believe.
I like mysteries.
I make pictures in my mind when I read.
I feel like I make friends with people in good books.
I read a lot of adventure stories.
I enjoy a long, involved story or fiction book.

*Recognition*
*People sometimes tell me I am well read.
*I like it when people think I am well read.
*I like to be able to say I have read popular books.
*I have lots of books in my home that are just for show.

*Social*
I talk to my friends about what I am reading.
I like to trade things to read with friends and family.
*I often go to bookstores with friends.
*I often go to coffee shops to sit and read a book.
*I like discussing the lasted bestseller with my friends or family.
*I am a member of a book club
*I get suggestions for books to read from my friends and family.

*Work Avoidance*
I don’t like vocabulary questions.
Complicated stories are no fun to read.
I don’t like reading something when the words are too difficult.
I don’t like it when there are too many people in the story.
*questions differ from those in Wigfield et al. (1996).

Appendix B

Reading Activity Questionnaire

Questions about reading for school
How many times did you read for class last week? _____
Please estimate the number of hours you read last week. _____
Please provide us some information about what you read for class last week. Write the title, author or specific topic that you read about. What classes were these reading for?

Questions about reading for personal enjoyment
How many times did you read for your own enjoyment last week? _____
Please estimate the number of hours you read last week? _____

Please provide us some information about what you read for your own enjoyment last week. Write the title, author or specific topic that you read about.

What types of things do you usually read for personal enjoyment? (check all that apply)

____Magazines
____Newspaper
____Books

____Fiction Books:
____Mystery/Adventure
____Fantasy/Science Fiction
____Romance
____Literature
____Other

____Non-fiction Books:
____Sports
____Nature
____Biography
____History
____Self-help
____Other
____Poetry

References


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