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The Relationship Between Self-Efficacy and Perceptions of Different Literacy Types Among College Students

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Studies on reading literacy have yet to connect how students perceive the importance of different literacy areas to their ability perception in those areas. This article analyzes students’ importance ranking of four different areas of literacy: prose (comprehending written information), document (interpreting information in forms, schedules, tables, and graphs), quantitative (using and comprehending numbers found in written material), and health (using health-related information). It was expected that perceptions of literacy importance would be related to self-efficacy and that students would rank quantitative literacy as the lowest in importance. As hypothesized, self-efficacy and importance rankings were positively related among 250 undergraduates (67 males, 183 females; Mean age = 21.88) who completed online surveys. Also, the importance ranking of and perceived ability in quantitative literacy were lower than the other literacy types. Although quantitative literacy is a significant indicator for future career success, participants do not perceive this area as valuable, nor do they have confidence in their quantitative literacy abilities. Limitations, implications, and suggestions for future research are discussed.

KEYWORDS perceptions, quantitative literacy, self-serving bias, self-efficacy
Moreover, most young adults (age 21–25) can read, but many do not understand complex material or how to apply information in real contexts (Kirsch & Jungeblut, 1986). According to Kirsch and Jungeblut, to be successful in today’s world, other forms of literacy are needed. These include prose (comprehending written information), document (interpreting information in forms, schedules, tables, and graphs), quantitative (using and comprehending numbers found in written material), and health (using health-related information) (Kirsch & Jungeblut, 1986). The need for examining college students’ literacy in various areas was summarized in a 2006 report from the American Institutes for Research (Baer, Cook, & Baldi, 2006). Specifically, Baer et al. found that although college students from both two-year and four-year institutions fared better in prose, document, and quantitative literacy than the average American adult, they had more struggles with quantitative literacy compared to the other literacy types.

The research literature is replete with studies on reading literacy (Bray, Pascarella, & Pierson, 2004; Lesley, Watson, & Elliot, 2007), and a growing area has investigated other forms of literacy, such as scientific literacy (Liu, 2009), media literacy (Thoman & Jolls, 2004), and cultural literacy (Reedy, 2006). However, not much is known about how students perceive the four types of literacy described by Kirsch and Jungeblut (1986). The research that does exist on perceptions of literacy has mainly focused on reading literacy. Specifically, Lesley et al. found that pre-service teachers (i.e., students who are training to be teachers) reported negative attitudes toward reading literacy because they didn’t believe they would be teaching reading in their content areas. The pre-service teachers also tended to procrastinate in their reading, used ineffective reading strategies, and did not make real world connections with their readings, which the researchers posit were the result of their attitudes toward literacy. Also, using a longitudinal design, Bray et al. (2004) measured literacy activities (e.g., enjoyment in reading poetry and literature, preference for reading personally relevant material) and reading abilities of third-year college students. Although students of color (primarily African American and Latino students) reported similar attitudes toward reading literacy compared to white students, students of color had less growth in reading comprehension, even when other factors were controlled (Bray et al., 2004). Bray et al. suggest that future research examine race and discrimination factors that may play a role in learning and college experiences for students of color. Also, Bray et al. found that women made smaller gains in attitudes toward literacy than men in the sample. The researchers posit that these findings may have to do with college experiences impacting women and men differently with regard to literacy activities.

Despite the fact that these studies demonstrate perceptions toward reading literacy, what is unclear in the literature is how students perceive the importance, or value, of knowledge in the literacy areas described by Kirsch and Jungeblut (1986). Further, there has been no research on whether college students’ perceptions of importance are related to self-serving bias and self-efficacy.
Self-Serving Bias and Task Importance

The self-serving bias, also referred to as the self-serving attribution (Heider, 1958; Zuckerman, 1979), occurs when perceptions of a cause for an event are influenced by the outcome of the event (Weary, 1979). For example, in the self-serving bias, positive outcomes are perceived as having to do with the perceiver’s own abilities (e.g., I did well because I am smart), but negative outcomes are attributed to external factors (e.g., I failed because the test was poorly written). According to Heider, individuals are motivated to preserve their self-esteem in situations where they can take credit for the good things and distance themselves from the bad things.

Although this bias has been demonstrated in students’ perceptions of their academic performance (Green, Bailey, Zinser, & Williams, 1994; Zuckerman, 1979), academic achievement (Marsh, 1986), and standardized tests like the ACT and SAT (Schmitt, Oswald, Kim, Gillespie, & Ramsay, 2004), there have only been a handful of studies on the self-serving bias in relation to task importance. For example, Sheppard and Arkin (1989) demonstrated that students generate self-handicaps, or excuses, to preserve their self-esteem and image in the face of a highly valuable or important task. That is, students found many reasons for failing on an important task, none of which were due to their own abilities. Self-handicapping is one form of self-serving bias in that it allows such students to view the situation as “not their fault” if they fail and “lucky” if they are successful, which ultimately helps protect their self-esteem (Sheppard & Arkin, 1989). With regard to Baer et al.’s (2006) finding that quantitative literacy skills are the most difficult area for undergraduates to master, in order to preserve self-esteem and perceive the situation in self-serving ways, the present study expects that participants will downplay the importance, or value, of quantitative literacy.

Self-Efficacy

Bandura’s (1977) theory of self-efficacy proposes that beliefs in one’s ability will affect behavior and effort in an activity. Self-efficacy has been studied extensively in a variety of populations, especially in the area of academic performance. For example, greater academic self-efficacy has been found to correlate with higher academic performance among undergraduate students at a U.S. liberal arts university (Brady-Amoon & Fuentes, 2011) and at a large university in Egypt (Abd-Elmotaleb & Saha, 2013). Researchers have also examined academic self-efficacy’s impact on performance among specific academic disciplines. MacPhee, Farro, and Canetto (2013) found that at graduation, academic self-efficacy, and academic performance of women, low-income students, and ethnic minorities in STEM (Science, Technology, Engineering, and Math) majors were higher than at entry. Furthermore, Sondgerath and Snyder (2013) demonstrated that self-efficacy predicted academic performance among students in an entry-level agricultural course.

With regard to self-efficacy and literacy, much research has focused on health literacy. This may be due to the growing concern of the general public’s lack of health knowledge, health skills, and confidence in health-related abilities that could
protect them from preventable illnesses and diseases. Researchers have shown that beliefs in the ability to manage one’s health and take medication relate to more positive health behaviors. For instance, Chen, Hsu, Tung, and Pan (2013) demonstrated the role of health literacy on self-efficacy in health management and preventive care among a sample of Taiwanese elderly adults (age ≥ 60 years). Additionally, Kim and Yu (2010) found that Korean older adults’ poor mental and physical health outcomes were related to low health literacy, which was mediated by self-efficacy in managing health. Moreover, Colbert, Sereika, and Erlen (2013) found that individuals living with HIV/AIDS were more likely to adhere to taking their medications if they not only have functional health literacy (e.g., knowing what questions to ask, understanding medical terminology) but also confidence in their abilities to take medications (health self-efficacy).

There is a paucity of research with regard to the self-serving bias and its relationship with self-efficacy. However, there appears to be a connection between how individuals perceive their own abilities (self-efficacy), and whether these perceptions influence their perceptions of the context to preserve self-esteem (i.e., whether they demonstrate the self-serving bias). For example, Silver, Mitchell, and Gist (1995) found that business undergraduates with high self-efficacy attribute their unsuccessful performance in self-serving ways. When an individual’s belief that they can succeed is threatened, they will ascribe their failures to external factors instead of internal ones (Silver et al., 1995). Given this finding, and given that individuals strive to maintain their self-esteem through perceiving events in self-serving ways (Heider, 1958), there should be a relationship between self-efficacy scores on literacy areas and the perceived importance of that literacy area. This is because perceived value would undermine participants’ self-esteem in a literacy area in which they do not possess the skills. Specifically, in the present study, it is expected that the value placed on literacy areas would be positively related to self-efficacy perceptions in that particular literacy area.

**Present Study’s Hypotheses**

The aim of the present study is to answer the following research questions: is there a relationship between perceptions of importance, or value, of literacy domains and perceptions of competency in that domain, and do students perceive the four types of literacy differently? Given the relationships found in the literature on self-efficacy and literacy (Austin, Pinkleton, Austin, & Van de Vord, 2012; Chen et al., 2013; Colbert et al., 2013), and given the link between self-serving bias, task importance, and self-efficacy (Sheppard & Arkin, 1989; Silver et al., 1995), the present study predicted that importance rankings of a particular literacy domain would relate to perceptions of competency (i.e., self-efficacy) in that domain. Additionally, given previous findings regarding college students’ literacy abilities (Baer et al., 2006), and the role of self-serving bias in perceptions (Silver et al., 1995), the present study also expected that the four types of literacy would be ranked differently on importance. Specifically, quantitative literacy would be ranked the lowest in importance. The four types of literacy investigated were prose literacy (comprehending written information), document literacy (using
information from tables, forms, schedules, and graphs), quantitative literacy (using and comprehending numbers found in written material), and health literacy (using health-related information) (Kirsch & Jungeblut, 1986).

**METHOD**

**Participants**

The researcher recruited participants for this online study using a psychology department’s research subject pool from a southern California private liberal arts university. The convenience sample consisted of 250 participants (183 females, 67 males) who met the criteria of being a college student over the age of 18. The average age of participants was 21.88 (SD = 4.21), and the majority of the participants were Latino/Hispanic (41.6%; n = 104). The next largest group was European American/Caucasian (32.8%; n = 82), followed by “Other” ethnicities that included bi-racial and mixed races (14.8%; n = 37), Asian American (6.8%; n = 17), and African American (4.0%; n = 10). The participants included freshmen (n = 76; 30.4%), sophomores (n = 68; 27.2%), juniors (n = 61; 24.4%), seniors (n = 42; 16.8%), and a few graduate students (n = 3; 1.2%). Freshmen included 38.2% Latino/Hispanic students, 35.5% European American students, 11.8% “Other” ethnicities, 7.9% Asian American students, and 6.6% African American students. Sophomores included 48.5% Latino/Hispanic students, 27.9% European American students, 14.7% “Other” ethnicities, and 8.8% Asian American students. Juniors were comprised of 39.3% Latino/Hispanic students, 34.4% European American students, 19.7% “Other” ethnicities, and 6.5% Asian American students. Seniors included 42.9% Latino/Hispanic students, 33.3% European American students, 11.9% “Other” ethnicities, 9.5% African American students, and 2.4% Asian American students. The three graduate students in the study were European American, African American, and “Other” ethnicities. Most participants were psychology majors (50.8%; n = 127); however, the sample also included art, biology, business, chemistry, communications, journalism, kinesiology, liberal arts, mathematics, sociology, and theater majors. The mean grade point average (GPA) reported was 3.24 (SD = .65). The majority of participants reported that they were not the first in their family to attend college (63.6%; n = 159). When asked about the highest level of education either of their parents received, approximately 28% of the sample had one or both parents who completed high school, 19.6% had one or both parents who completed community college or a technical college, and 22.4% of the sample had one or both parents who completed college. Approximately 17.6% of the sample had one or both parents who completed graduate school. It should be noted that the discrepancy between parents’ educational attainment and first-generation college status percentages in the sample could be due to the first-generation college question including siblings in the family who had ever attended college. In terms of self-efficacy ratings, participants perceived their document literacy ability as the highest compared to the other types of literacy (See Table 1 for means, standard deviations, and rankings of importance of all literacy areas).
<table>
<thead>
<tr>
<th>Literacy Type</th>
<th>Importance Ranking</th>
<th>Self-Efficacy</th>
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<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
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<tr>
<td>Prose</td>
<td>2.58</td>
<td>1.19</td>
</tr>
<tr>
<td>Document</td>
<td>2.74</td>
<td>.97</td>
</tr>
<tr>
<td>Quantitative</td>
<td>2.13</td>
<td>1.03</td>
</tr>
<tr>
<td>Health</td>
<td>2.54</td>
<td>1.17</td>
</tr>
</tbody>
</table>

Note. Higher numbers indicate greater importance or greater self-efficacy.

### Measures

#### Demographic Questionnaire

The researcher designed a demographic questionnaire consisting of eight items. These items asked participants to report age, gender, race, college standing, major, GPA, first-generation status (i.e., whether they were the first in their family to attend college), and parental educational level (i.e., the highest level of education either one of their parents attained).

#### Literacy Self-Efficacy

The researcher designed a measure of self-efficacy for the four types of literacy (prose, document, health, and quantitative). After participants read the definitions for each type of literacy using Kirsch and Jungeblut’s (1986) descriptions, participants reported their “feelings of competence” for each of the described types of literacy using a 10-point Likert scale, with one being “Not Very Competent” and 10 being “Very Competent”. The measure also asked participants to rank each literacy area in terms of importance by placing each literacy area in order by “most important” to “least important.”

#### Procedure

Participants accessed the questionnaire online and consented to participate by clicking “I AGREE” on the first screen. The first screen described the study’s goals, participants’ rights, and researcher’s information. Next, participants answered the eight demographic items. Participants then read definitions for prose literacy, document literacy, health literacy, and quantitative literacy as described by Kirsch and Jungeblut (1986). Following the definitions, participants ranked the order of importance for the four literacy types described. Finally, participants reported their “feelings of competence” for each of the four types of literacy described, using a 10-point Likert scale. As an incentive to participate, participants could enter a drawing to win one of four $20 Barnes & Noble bookstore gift cards by e-mailing their name to a separate e-mail address that the researcher created for the study. Participants took approximately 10 minutes to complete the online questionnaire.
RESULTS

Participants were asked to rank the literacy areas from one to four, but the researcher recoded participants’ rankings before hypothesis testing to reflect the fact that higher numbers mean greater importance (i.e., “most important” was recoded as 4 and “least important” was recoded as 1). The recoding helped to clarify the results in terms of explaining greater importance having higher numbers. To test the hypothesis that students’ perceived ability (self-efficacy) and literacy importance rankings are related, the researcher conducted a Spearman’s correlation. Results showed that rankings of importance were significantly and positively related to self-efficacy beliefs in corresponding literacy areas ($p < .05$). Specifically, higher prose, document, quantitative, and health self-efficacy ratings were related to higher rankings of importance for that particular area of literacy, as predicted. Curiously, there were significant negative relationships among importance rankings on health literacy and the self-efficacy ratings in the other literacy areas. That is, lower rankings of health literacy importance related to higher self-efficacy scores in prose, document, and quantitative literacy ($p < .01$). See Table 2 for correlation data.

For the second hypothesis, the researcher used Kendall’s W test of agreement in rankings to test the differences in the rankings of importance for each literacy area. As predicted, results showed significant agreement in rankings among the participants, $\chi^2 (3) = 30.494$, $p < .001$, Kendall’s $W = .041$. Participants ranked document literacy the most important ($M$ rank $= 2.74$, $SD = .97$) and quantitative literacy the least important among the four types ($M$ rank $= 2.13$, $SD = 1.03$).

DISCUSSION

Findings from the present study support the posited relationship between self-serving bias and self-efficacy in that there was a significant correlation between importance rankings and self-efficacy scores among the four literacy domains. Also, as expected, participants rated quantitative literacy the least important and they perceived self-efficacy for quantitative literacy the lowest among the four types. This supports the present study’s assertion that the self-serving bias effect may play a role in perceptions of efficacy and perceived importance in these four literacy areas. Students’ lower rankings of importance for a literacy area may help

| Table 2. Spearman Correlation Data of Importance Ranking and Self-Efficacy by Types of Literacy |
|---------------------|-----------------|-----------------|-----------------|-----------------|
| Literacy Area       | Prose SE        | Document SE     | Quantitative SE | Health SE       |
| Prose Rank Value    | .183**          | .069            | −.049           | −.062           |
| Document Rank Value | .098            | .242**          | .009            | .052            |
| Quantitative Rank Value | −.094      | −.086           | .248**          | −.142*          |
| Health Rank Value   | −.175**         | −.190**         | −.176**         | .155*           |

Note. SE = Self-efficacy ratings.

*p < .05. **p < .01.
them feel better about the fact that they do not have skills in those areas, which could preserve their self-esteem. Self-serving biases and self-efficacy have not been examined together in previous research in terms of literacy skills. Therefore, findings from this study provide new information within literacy scholarship on the relationship between perceived competency (self-efficacy perceptions) and perceptions of task importance.

Much of the research literature on the various forms of literacy (e.g., science literacy and media literacy) argues for their importance in education. For example, Liu (2009) makes a case for teaching individuals to understand the basic concepts of science and to use this knowledge to solve practical problems. According to Liu, science literacy should be viewed not only as an economic necessity, but as an opportunity for personal enhancement and a chance for individuals to be civically engaged. Additionally, Thoman and Jolls (2004) believe that media literacy is a necessary skill because individuals need to learn how to critically read, analyze, and evaluate media since they are surrounded by many sources of media and technology on a daily basis. However, many of these studies begin with the assumption that individuals agree with the importance of these various forms of literacy. Results from the present study showed that participants ranked document literacy the most important and quantitative literacy as the least important. This finding should inform educators that teaching students to be literate in quantitative skills is not enough. In fact, students may not see value or importance in attaining literacy in quantitative skills compared to other forms of literacy. Therefore, teaching students about the application and value of quantitative literacy should accompany teaching literacy skills.

Currently, there are strides in the area of education and application to real world problems, at least at the primary school level. With the adoption of Common Core State Standards (CCSS) among 42 of the 50 states in the United States (Rentner & Krober, 2014), students are taught how to apply their knowledge in practical ways. However, according to Riley (2013), the key to applying this knowledge is affording students opportunities for application. These opportunities include engaging them in interactive activities and experiments and collecting quantitative and qualitative data using cross-disciplinary approaches (Riley, 2013, p. 27). Arguably, if students can apply their learning they may see the value of developing skills in areas such as quantitative literacy.

The surprising finding in the present study was that lower health importance rankings related to higher self-efficacy scores on prose, document, and quantitative literacy. Some previous research on health literacy has suggested that health literacy may be impacted by more than just perceptions of efficacy with regard to health management and taking medications. For example, Austin et al. (2012) found that both media literacy and information efficacy were related to self-efficacy in decision-making regarding health issues. Specifically, Austin et al. showed that students who were able to correctly identify and self-diagnose influenza symptoms also demonstrated greater information efficacy (the belief in one’s ability to determine different qualities of health information) and media literacy (the ability to access sources of information and compare its usefulness and validity to other sources). Therefore, lower importance rankings of health literacy may reflect the
assumptions that having self-efficacy in other forms of literacy (i.e., prose literacy, document literacy, and quantitative literacy) would compensate for less emphasis on health literacy’s importance. That is, individuals who have the ability to gather information about health issues and understand health statistics may perceive having health literacy skills as less important than having document or quantitative literacy skills.

**Strengths and Limitations**

Several strengths of the present study included an ethnically diverse sample and the use of online questionnaires. The large number of Latino students in the sample allows the findings to be generalizable to this population, which has been often overlooked in literacy research. Also, the study used online questionnaires, which allowed participants to easily rank their literacy choices, and online questionnaires can be as reliable and valid as paper questionnaires (Brock et al., 2014). However, some limitations to using online surveys are that participants who were not qualified to participate could have completed the surveys and confidentiality could be limited if the data were hacked (Emery, 2014). Also, a limitation of the present study was that not all types of literacies were examined (e.g., media literacy, science literacy, cultural literacy). Therefore, rankings of literacy types may have been impacted by the limited choices of literacy types given. Additionally, participants reported their perceived abilities (i.e., their self-efficacy) in each of these types of literacies, but they did not demonstrate their abilities in any of these areas. Thus, it is not known whether self-efficacy and perceived importance of literacy would be related to actual performance.

**Implications and Future Directions**

The findings demonstrate that perceived importance is related to perceived abilities. Therefore, educators need to convey to learners the importance of various types of literacy and how they can be applied to students’ lives. As mentioned previously, many U.S. states are seeing the value of teaching primary school students how to apply their learning to real world problems (Rentner & Krober, 2014). At the college level, practical application of the skills students learn can be achieved through encouraging internship experiences with research institutions, businesses, and community organizations. Students who experience internships have greater retention in school, greater focus on their career path, and report seeing greater value in their courses (Gavigan, 2010). Additionally, as Riley (2013) suggested, incorporating opportunities for applying skills in the classroom can demonstrate to students the importance of these skills. For example, Grant, Malloy, Murphy, Foreman, and Robinson (2010) found that college seniors in an information technology program reported greater value and satisfaction with their capstone course. This is because it allowed them to work with external business partners to develop programs and utilize their technical and quantitative skills for these companies. Thus, these examples show that application of skills positively supports students’ valuing and learning those skills.
Also, if perceived importance is related to self-efficacy, and if self-efficacy is related to actual performance in a domain (Abd-Elmotaleb & Saha, 2013; Brady-Amoon & Fuertes, 2011; MacPhee et al., 2013), it stands to reason that educators need to ask students how they perceive these forms of literacy. Findings from Lesley et al.’s (2007) study showed that students with more negative literacy attitudes used ineffective reading strategies and procrastinated in their reading. Given the present study’s findings on literacy perceptions and importance rankings, and given Lesley et al. findings, educators must consider both how to improve literacy skills and also how to influence perceptions of literacy, as these perceptions appear directly related to students’ skills. Thus, as previously suggested, there is a need for future research to examine perceptions and to not make assumptions about students’ attitudes toward these skills.

Moreover, literacy in other areas outside of reading is a growing avenue of research. But examining different types of literacy can be difficult due to lack of consistency in definitions. For example, math literacy (Clarence, 2010) and quantitative literacy (Vacher, 2011) appear to be similar and overlap in many ways, but researchers use these different terms to refer to the ability to use mathematical concepts (i.e., math literacy; Clarence, 2010) and interpret mathematical information (i.e., quantitative literacy; Vacher, 2011). Future scholarship on literacy needs to explore the various conceptualizations of literacy and whether many of them are distinct or actually one and the same.

Conclusions

Not only do the present study’s findings support the relationship between self-serving bias and perceptions of task importance, the findings also show that self-efficacy may play a role in students’ perceptions. Research on perceptions of academic ability and intelligence demonstrate that some students tend to avoid learning difficult material because they believe that intelligence is fixed and that effort for studying is futile (Dweck & Master, 2008). This may be especially true for quantitative literacy, which is perceived by students to be the most difficult of the four literacy types (Baer et al., 2006). However, putting effort into learning is important, especially in the face of failed attempts, because students can adjust their strategies and learn from their mistakes (Dweck & Master, 2008).

Early education in the United States has emphasized mastery of reading more so than developing competency in quantitative skills (Ripley, 2013). Students can learn the basic skills for reading and use this skill in a variety of contexts and environments. This is not the case with quantitative literacy, which may not have as many apparent applications. For example, college students are surrounded by documents they must read and understand, such as college forms, course syllabi, and assigned readings, but the need to understand and use numbers can be more easily avoided. For example, Cusatis and Martin-Kratzer (2010) found that journalism students had very little math education in their college curriculum and had fair to poor ratings of their math skills. Additionally, when journalism students were asked about their perceptions of the importance of math education overall for journalism majors, 52% of respondents stated that they believed math education
was important, with 34% stating they felt neutral or didn’t think math was important at all. However, Cusatis and Martin-Kratzer point out that journalists need strong quantitative literacy skills to comb through data to understand the information they need to put in a story or article. Further, incorrect reporting of data can hurt the public, especially if the data pertains to science and health issues (Cusatis & Martin-Kratzer, 2010).

Without a doubt, success in today’s world is dependent on other forms of literacy besides reading (Kirsch & Jungeblut, 1986). Given the present study’s findings and the need to develop literacy in a variety of areas, future research needs to give considerable attention to the role of perceptions (i.e., self-serving biases and self-efficacy perceptions) for different forms of literacy, as well as investigating students’ attitudes toward application and importance of these forms of literacy.

ABOUT THE AUTHOR
Ngoc Hong Bui received her MA and PhD degrees in social psychology from the University of Nebraska-Lincoln. She is currently a tenured professor in the Psychology Department at the University of La Verne. Her research interests include social factors in counseling and clinical psychology, teaching and learning psychology, science attitudes, procrastination, person perception, and media psychology.

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