Exploring Vocabulary Self-Concept of Middle School History Students with Reading Difficulties

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Exploring Vocabulary Self-Concept of Middle School History Students with Reading Difficulties

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

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in

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by

Sarana Eyire Roberts

June 2016

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ABSTRACT OF THE DISSERTATION

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by

Sarana Eyire Roberts

Doctor of Philosophy, Graduate Program in Education
University of California, Riverside, June 2016
Dr. Rollanda O’Connor, Chairperson

Many adolescents with reading difficulties experience low self-concept. One commonality found across poor readers, including students with reading disabilities (RD) as well as students who are English learners (ELs), is the difficulty they face grasping history text with academic vocabulary that is beyond their current level of vocabulary development. While the field is beginning to understand the relationship between reading achievement and reading self-concept in adolescents, less is understood about the relationship between vocabulary knowledge specifically and vocabulary self-concept of adolescent poor readers in content areas such as US history. This study examined whether U.S. history vocabulary knowledge predicts the vocabulary self-concept of 102 eighth-grade adolescents identified as poor readers. Also examined was whether differences existed between the vocabulary self-concept of the 51 poor readers who received three weeks of vocabulary instruction and the 51 poor readers who did not receive the vocabulary instruction. Results indicated adolescent poor readers’ vocabulary knowledge
predicts their self-concept regardless of instruction condition. Prior self-concept was also found to predict post-instruction self-concept. In addition, adolescents who received vocabulary instruction had a higher vocabulary self-concept than their peers who did not receive vocabulary instruction. No significant differences were found based on student characteristics (i.e., RD or EL status). Practical implications and a need for future research are discussed.
Acknowledgements

This dissertation is dedicated to my family. My mother, Sanguretta Roberts, and my father, Samuel Roberts, have been my emotional support throughout this process and have truly been my rock. This is also dedicated to my brother and best friend Abia Roberts, who has been there to listen. I am grateful for their strength, guidance, love, and abundant support.

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Chapter 1: Introduction

Studies spanning from the early 1960s to the present have taken interest in examining students' self-concept (Bem, 1967; Bong & Clark, 1999; Harter, 1990; Osborne, & Jones, 2011). The “perceived” self, or belief about the self that an individual holds, has received much attention because it is thought to contribute to an individual’s successful functioning and adaptation across learning domains due to its relation to self-efficacy and motivation (Bong & Clark, 1999; Bandura, 1995). A body of literature seems to suggest that high self-concept leads to better learning and life outcomes, whereas low self-concept leads to weaker social and learning outcomes (Bandura, 1995; Bem, 1967; Bong & Clark, 1999; Harter, 1990). Figure 1 displays a concept map demonstrating how self-concept is related to an individual’s education, cognition, and psychological well-being.

In recent decades, self-perception has arisen as a key aspect of an individual’s school-related self-concept and has been a particularly significant factor when considering students’ motivation and ability to learn (Harter, 1990). Individuals who perceive themselves as having high ability in a specific academic domain are likely to believe that they will be successful at performing a domain specific task. Thus, it is likely that individuals with high self-concept in a given domain will have high self-efficacy (Bong & Clark, 1999). Therefore, self-concept is an important part of student learning because it is said to mediate the relationships found between self-efficacy and student learning.
Adolescents who struggle to maintain adequate performance in a specific academic domain (e.g. math, science, history) may also struggle to maintain high and positive self-concept of their domain specific academic abilities. Yet, literature that explores the adolescent self-concept has focused on global aspects of social and academic self-concept, and domain specific academic self-concept has been neglected until most recent decades.

Unfortunately, adolescents with reading difficulties seem to experience difficulties with academic self-concept, indicating these adolescents to have more negative views of their abilities and self-worth (Grum, Lebarič, & Kolenc, 2004; Prout, Marcal, & Marcal, 1992). Research suggests adolescents who have low academic self-concept in reading are at higher risk of academic failure in core content areas (Fathi-Ashtiani, Ejej, Khodapanahi, & Tarkhorani, 2007). Researchers have also found this subgroup to be at high risk of developing low academic self-esteem, as well as high levels of anxiety and depression (Fathi-Ashtiani et al., 2007; Rosenberg, Schooler, & Schoenbach, 1989). Therefore, it seems that in order to support students with reading difficulties, efforts may need to be placed on examining whether an increase in reading self-concept can be achieved alongside providing reading interventions (Calsyn & Kenny, 1977; Marsh, 1990; Marsh & Craven, 2006), especially for those in adolescent years of schooling when an individual’s self-concept has developed based on past experiences in learning situations.

Research suggests reciprocal effects between self-concept and reading achievement for typical readers (Marsh, 1990; Marsh & Craven, 2006). Yet, more recent
research that implemented a longitudinal design found strong support in favor of the skill-development hypothesis, where reading achievement predicted students’ self-concept (Retelsdorf, Köller, & Möller, 2014). Moreover, Fisher and Frey (2014) conducted a study examining whether teaching fluency and comprehension strategies to middle school students affected their self-concept of their reading ability. They found students had a higher self-concept of their reading ability after receiving the fluency- and comprehension-based intervention. However, to the authors’ knowledge, this relationship has not been explored in the reading area of vocabulary.

Vocabulary might be especially useful to explore because many adolescents who struggle with reading also lack academic vocabulary. Approximately 60% of language minority and 40% of native English speaking adolescents have been found to have reading difficulties (Lesaux & Kieffer, 2010). One commonality found within the reading difficulties of these two groups was that both were characterized by low vocabulary knowledge (Lesaux & Kieffer, 2010). Thus, exploring the relationship between academic self-concept and vocabulary knowledge of poor readers is of particular interest for this dissertation.

Academic vocabulary is particularly crucial to improving the understanding of history content (Alexander-Shea, 2011; Boyd, Sullivan, Popp, & Hughes, 2012; Hairrell et al., 2011; Kinder & Bursuck, 1993; Konopak, 1988; Swanson et al., 2014). Many adolescents with RD have difficulty understanding complex historical concepts, mainly due to their low reading abilities (De La Paz & MacArthur, 2003; Gersten, Baker, Smith-Johnson, Dimino, & Peterson, 2006). Students who do not understand the vocabulary
presented in history textbooks are likely to experience difficulty understanding history content. Furthermore, improving vocabulary knowledge has been found to improve historical comprehension (Alexander-Shea et al., 2011; Carney, 1984; Townsend, Filippini, Collins, & Biancarosa, 2012; Vaughn et al., 2009). Given our knowledge of the important role vocabulary plays in the reading difficulties of students with reading difficulties, including English learners (ELs; Lesaux, Kieffer, Faller, & Kelley, 2010), studies designed to improve history knowledge of older students have introduced components targeting vocabulary improvement (O’Connor, Beach, Sanchez, Bocian, & Flynn 2015; Vaughn et al., 2009; Vaughn, 2013). Providing these adolescents with instructional reading supports made historical concepts presented in textbooks more accessible.

The purpose of the proposed dissertation is to explore the relationship between the vocabulary self-concept and vocabulary knowledge of poor readers within the context of history. Fueled by skill-development theory (Calsyn & Kenny, 1977), I also explore whether providing vocabulary instruction to adolescents in the area of history can enhance their academic self-concept. In the following chapter I discuss the literature on theories used to explain the direction of the relationship between self-concept and reading achievement, the self-concept of poor readers, and the effectiveness of reading and vocabulary interventions on self-concept. Subsequent chapters will address the method, results and discussion for adding to the literature base.
Chapter 2: Review of the Literature

Defining Self-Concept

Several variations in definitions of *self-concept* and the interchanging usage of related constructs have made it difficult for researchers to interpret results of studies on self-concept. As defined by Shavelson, Hubner, and Stanton (1976), self-concept can be viewed as perceptions of oneself that are multidimensional and are either domain-specific or global. More specifically, an academic self-concept refers to an individual’s perception about their knowledge and abilities in achievement situations (Byrne, 1984; Shavelson and Bolus, 1982; Wigfield & Karpathian, 1991). The present study uses the term *reading self-concept* to refer to an individual’s perception about his or her reading abilities. The term *vocabulary self-concept* is used to refer to an individual’s perception of his or her own vocabulary knowledge in within a specific academic domain.

Although the terms self-concept and *self-efficacy* are often used interchangeably in the research literature, they can also refer to different constructs (Alvermann, 2002). An individual’s self-concept is considered to be domain specific, whereas self-efficacy is thought to be task specific (Alvermann, 2002). For instance, adolescents may have a positive self-concept of their reading abilities, but rate themselves low on their confidence in their ability to comprehend the Declaration of Independence, which would imply low self-efficacy for that particular task. Thus academic self-efficacy refers to an individual’s belief about his or her ability to successfully perform given academic tasks at designated levels or points in time (Schunk, 1991).
**Skill-Development Theory**

Over the course of the past 5 decades, researchers have taken interest in the relationship between academic self-concept and academic achievement of adolescents. Although a positive relationship between academic self-concept and achievement has been established by a vast number of studies (Möller, Pohlmann, Köller, & Marsh, 2009; Scheirer & Kraut 1979; Valentine, DuBois, & Cooper, 2004), three theories have been explored to understand the direction of this relationship: self-enhancement theory, skill-development theory, and reciprocal theory. Some theorists in the area of educational psychology believe in the self-enhancement theory posited Calsyn and Kenny (1977) (Marsh, Hau and Kong, 2002; Marsh et al., 2005) where academic self-concept is thought to predict academic achievement. They believe that academic achievement is derived from adolescents’ competency beliefs and that enhancing these beliefs would in turn enhance adolescents’ academic achievement. In contrast, Calsyn and Kenny (1977) also hypothesized the skill-development theory, where academic achievement predicts academic self-concept, explained the relationship between academic self-concept and academic achievement. Of the two theories research has mostly favored the skill development theory (Calsyn & Kenny, 1977; Möller et al., 2009; Möller, Retelsdorf, Köller, 2011; Retelsdorf, Köller, & Möller, 2014). In addition, studies designed to test directional dominance have found predominance in academic achievement predicting academic self-concept which also supports the skill-development theory (Calsyn & Kenny, 1977; Kenny, 1979; Muijs, 1997; Shavelson & Bolus, 1982; Shavelson & Stuart, 1980).
Yet a bidirectional relationship between self-concept and reading achievement has also been found, indicating that each construct has a positive influence on the other (Guay, Marsh, & Boivin, 2003; Marsh, 1990; Marsh & Craven, 2006; Marsh & Martin, 2011). This reciprocal theory of a bidirectional relationship appears to be the most widely accepted theory to explain the relationship between academic self-concept and academic achievement by individuals in the field of education. However, Marsh (1990) highlighted the importance of targeting the specific type of academic self-concept researchers wish to explore if insights are to be gained for intervention purposes. Using factor analysis procedures Marsh identified math and verbal (i.e., reading) domains as two distinct factors of an adolescent’s academic self-concept, with each factor having its own relationship to academic achievement. Later Marsh (1993) and Marsh and Craven (2006) argued that these domains are so different that variation in an area such as reading self-concept could not be explained by the more global construct, academic self-concept.

Although substantial research demonstrates there to be a bidirectional relationship between academic self-concept and academic achievement, research is lacking to support a bidirectional relationship between reading self-concept and reading achievement (Retelsdorf, et al., 2014). Instead the skill-development theory--where reading achievement predicts reading self-concept--appears to be most supported in recent years. Using structural equation modeling Retelsdorf et al. (2014) assessed the direction of the relationship between reading self-concept and reading achievement of 1508 adolescents. Longitudinal data were gathered at grade 5, grade 6, grade 8, and end of grade 9. They found support for the self-enhancement and reciprocal theories in only the
early years of adolescent reading self-concept and reading achievement. Support was found for the skill-development theory throughout all years of adolescent schooling. More specifically, grade 5 reading achievement significantly predicted grade 6 ($r=.32$), grade 8 ($r=.35$), and grade 9 ($r=.40$) reading self-concept. Yet, grade 5 reading self-concept only significantly predicted grade 6 reading achievement ($r=.32$), with no other effects of self-concept on achievement yielding significance. Therefore, it would seem logical that reading self-concept might be enhanced by boosting the reading skill of interest. While reading achievement has been found to predict reading self-concept, little research has explored the vocabulary self-concept of adolescents.

**Self-Concept and Poor Readers**

The aforementioned studies assessing skill development theory did not do so by specifically targeting a sample of poor readers. Rather they assessed the merit of this theory with a sample of typically achieving adolescents. Poor readers (i.e., adolescents who have been identified as reading below grade level) could benefit most from us furthering our understanding of the relationship between reading self-concept and reading achievement, especially in intervention research.

Poor readers appear to have a lower reading self-concept than their typically achieving peers (Chapman, 1988; Grum et al., 2004; Polychroni, Koukoura, & Anagnostou, 2006; Prout et al., 1992). This could be due to poor readers also having lower reading achievement than their typically achieving peers. Therefore, it would be expected that in relation to their peers, poor readers’ reading self-concept would also be lower. However, when comparing the reading self-concept of poor readers to their
reading achievement, it appears that these students hold a self-concept that is not commensurate with their reading achievement; they rate themselves as having greater reading abilities than reading achievement measures report (Chapman, 1988; Meltzer, Roditi, Houser, & Perlman, 1998; Polychroni, et al., 2006). These differences in typically achieving adolescents and poor readers may contribute to a difference in the relationship found between reading self-concept and reading achievement, with reading achievement possibly having a smaller ability to predict reading self-concept in poor readers than what prior studies report for samples of typically achieving adolescents. Although poor readers are a homogeneous group in terms of low reading achievement, there is heterogeneity based on RD (i.e., RD and non-RD) and language status (i.e., EL and English only (EO)). Therefore, in this study I will explore whether differences in RD and EL status can explain variation in reading self-concept beyond what can be explained by reading achievement. may also provide insight into the reading self-concept of poor readers.

Self-Concept and RD. Research has established that adolescents with reading disabilities (RD) have lower self-concept of reading ability than adolescents without RD (Chapman, 1988; Grum et al., 2004; Polychroni et al., 2006; Prout et al., 1992). Chapman (1988) reviewed studies, spanning from 1978–1986, on the self-concept of students with and without RD and found students with RD had lower academic self-concepts than their non-RD peers. Students with RD had greater deficits in their academic self-concept than in their general self-concept. Deficits in academic self-concept appeared by third grade, and remained stable through high school. If self-concept
is linked to learning, these findings suggest a need to provide intervention in middle school, before self-concept stabilizes, because without intervention academic self-concept will likely remain low. Low self-concept of students with RD existed regardless of setting type (i.e. special day, mainstream, general education) (Chapman, 1988).

More recent literature has also demonstrated a discrepancy between the reading self-concept of students with reading disabilities (RD) and their non-RD peers. Polychroni and colleagues used self-report measures to assess perceptions of academic ability, reading attitudes, and approaches to learning (Polychroni et al., 2006). Teachers’ ratings of reading performance of 32 5th and 6th graders with RD were compared to 115 students with average to low performance, and 95 students with high performance (Polychroni et al., 2006). Students’ perception of ability and reading-related achievement, as well as perception and attitude towards school was assessed. Results indicated that students with RD had lower academic self-concept along with lower reading achievement than the low to average and high performance groups. Other researchers have also found students with RD to have lower self-concept than students without RD (Grum et al., 2004; Polychroni et al., 2006; Prout et al., 1992).

Two studies provide insight as to why students with RD might rate their academic abilities lower than their typically achieving peers. Heyman (1990) explored the self-esteem and self-concept of their learning disability of 87 students with RD, aged 9 through 11 years. In his study, the Self-Perception of Learning Disability (SPLD) was used to measure the extent to which students believed their disability to be modifiable and non-stigmatizing, or unchangeable and stigmatizing. He found urban students’ who
had a low self-concept also had low self-esteem and students with high self-concept had high self-esteem; these relationships remained significant after controlling for sex, ethnicity, age, reading achievement, self-contained versus mainstreamed classroom setting, and age of diagnosis. Rothman and Cosden (1995) replicated Heyman's findings using two sets of measures and a demographically different population. Fifty-six third-through sixth-grade middle-class students with learning disabilities were administered Heyman's SPLD scale and two scales developed by Harter (1985) to measure general and domain-specific self-concept and social support. Both Heyman (1990) and Rothman and Cosden (1995) found students who had low self-concept of their reading ability also had negative views of their learning disability, indicating that the low self-concept of academic ability of students with RD could be due to negative feelings about their disability hindering their reading performance. However, their studies lacked the ability to explain whether these findings were unique to students with RD or whether all low performing students display similar self-concept. A limited number of studies have assessed the differences between low performing students with RD and without RD.

Section Summary: When comparing adolescents with RD to their typically achieving peers without RD, students with RD display lower self-concept of their academic and reading abilities. This trend in self-concept of special education students with RD appears to be consistent across studies dating back to 1978. Many studies compared students with RD to typically achieving peers without RD, without exploring the students who fall in between (i.e. students who are low performing who do not have RD). The collective research in the area of self-concept leads us to ponder whether low
reading self-concept is solely characteristic of individuals who are classified as having a disability or if this relationship exists within all individuals with reading difficulties who are at risk of academic failure.

**Self-Concept and EL Status.** Self-concept of reading in English may be different for ELs due to the fact that they are learning to read while working on English language development at the same time. While some parents of ELs might speak English in the home, many conversations ELs have in homes and with friends do not expose them to academic language and vocabulary used in schools (Branum-Martin, Mehta, Carlson, Francis, & Goldenberg, 2014). Students who are learning English as a second language have lower confidence in their English language abilities, which could lead to lower self-efficacy and self-concept of their English reading abilities. Given the large number of ELs who are at risk of academic failure and qualify for special education services, exploring EL self-concept would enhance our understanding of the self-concept of these poor readers.

We could derive some insight from international studies on the self-concept of ELs. In a 6-year longitudinal study, Marsh and Kong (2002) examined relations among academic self-concept, academic achievement, and language of instruction (Chinese as compared with English) of 7,802 high school students. In support of the cross-cultural generalizability of the reciprocal effects model, prior self-concept had significant effects on subsequent achievement beyond the effects of prior achievement; and prior achievement had effects on subsequent self-concept as well. Support for the reciprocal effects model was not influenced by language of instruction, and the strength of that
support did not differ in English and Chinese language high schools. Particularly in the early high school years, however, instruction in a second language (English rather than Chinese) during early high school years had particularly negative effects on academic self-concept and academic achievement.

Yamashita (2004) examined the relationship between both first language (i.e. Japanese) and second language (i.e., English) reading self-concept. Fifty-nine Japanese college students learning English as a second language were given a 5-point Likert scale self-concept questionnaire that asked about students’ reading self-concept for Japanese and English. Findings showed EL’s positive self-concept of reading ability was less likely to transfer from their first language to their second language; EL self-concept of English reading ability was lower than their first language self-concept.

Self-concept of ELs who speak an Asian Language may differ from the self-concept of Spanish Speaking ELs. Therefore, studies of ELs who speak Asian languages may not accurately represent the self-concept of Spanish-Speaking ELs. This line of thinking led to Niehaus and Adelson (2013) conducting a 3-group analysis using longitudinal data that compared the self-concept of 3rd grade native English-speaking children, Spanish-speaking ELs, and ELs from Asian language backgrounds. The Self-Description Questionnaire–I (SDQ-I; Marsh, 1990b) was given to 11,020 native English-speaking children, 1,277 Spanish-speaking ELs, and 546 ELs from Asian language backgrounds. Cross-group comparisons of latent means indicated significant differences in academic self-concept, with Spanish speaking ELs reporting higher academic self-concept in reading compared to native English-speaking children (unstandardized
estimate = .102, \( p = .030, d = 0.085 \). Although differences were not found in the self-concept of ELs who speak an Asian language and EOs, this study does demonstrate differences between the self-concept of Spanish-speaking ELs and EOs. However, self-concept differences between Spanish speaking ELs and EOs have not been explored with middle school students. In addition, these studies did not control for reading achievement. Controlling for reading achievement is important because it could be that any differences found between Spanish-speaking ELs and EOs were due to language ability and not necessarily achievement.

Section Summary: Few studies have examined the reading self-concept of ELs. Studies assessing self-concept of ELs have been conducted on students who are at the college-level and who are adults rather than school age children. These studies suggest ELs who are secure in their first language have lower reading self-concept in English than they do in their first language. However, K-8 EL students represent a unique population of ELs because they often do not read in their native language.

**Academic Interventions**

Few studies have tried to determine whether interventions can be provided that improve student self-concept. Hattie (1992) conducted a meta-analysis of studies addressing change in self-concept. The 89 studies included both intervention studies and studies of change over time without intervention. The results of the meta-analysis indicated that overall, approximately 10% of individuals who received some type of intervention demonstrated higher scores on self-concept compared to individuals in control groups. Academic interventions had a small mean effect size of 0.18. In line with
the model of self-concept that addresses dimensions of self-perceptions, academic interventions had a greater effect on academic self-concept (ES = 0.22) than on global self-concept (ES = 0.08).

Building on Hattie’s (1992) previous study, Hattie, Briggs and Purdie (1996) conducted a meta-analysis that examined 57 studies on learning and study skills interventions targeting self-concept as an outcome measure. Interventions were categorized as cognitive (enhancing a specific task-related skill) or metacognitive focused on self-management of learning (e.g. planning, implementing, monitoring one’s learning). The effect of all interventions on self-concept was .48; however, middle school students yielded a self-concept effect size of .09, much lower than the average. Their team also concluded that interventions that intended to improve self-concept and academic performance should use tasks within the same domain as the target content and promote a higher degree of student activity and metacognitive awareness. Interventions that had these components fared better in terms of improving student self-concept than interventions that did not include such components. Additionally embedding instruction within the teaching context helps students to understand how, where, and why they are learning a particular skill or strategy (Hattie et al., 1996), which can aid in improving meta-cognition. However, their study did not address the effect reading interventions had on adolescents or on students who had reading difficulties, nor did they include ELs in their analyses.

Elbaum and Vaughn (2001) conducted a meta-analysis that investigated the effectiveness of 82 school-based interventions aimed at enhancing the self-concept of
students with LD. Similar to the effect size presented in Hattie’s (1992) study (ES=.18), they found the interventions they examined had an overall mean weighted effect size of 0.19 for self-concept outcomes. They also found no differences in the magnitude of intervention effects based on whether the students were taught full-time in self-contained classrooms, taught full-time in the regular education classroom, received part-time pull-out services, or received some combination of services. Yet when grade level was taken into account, the mean weighted effect size of interventions on self-concept for middle school students (d = .42) was higher than for elementary students (d = .12). They found interventions to have a greater effect on academic self-concept (d = .28) than on social self-concept (d = .18) or general self-concept (d = .15). However, school-based interventions included in their meta-analysis were coded as either counseling or academic, and not based on the type of academic content they primarily addressed (i.e., reading for this proposal).

Section Summary: The three meta-analyses discussed here have contributed greatly to our understanding of just how effective interventions can be for improving self-concept. Meta-analyses conducted by Hattie and his colleagues (1992; 1996), as well as Elbaum and Vaughn (2001), provide substantial support for the notion that interventions can be designed that improve aspects of self-concept. Although we have an idea of the effectiveness of generic interventions on self-concept, less is known about the effect of specific reading interventions on the self-concept of adolescents who experience reading difficulties. Elements of reading interventions implemented to improve reading may also in turn improve the self-concept of students even though this was not their original intent.
Reading Interventions

Reading interventions that target self-concept outcomes for adolescents have concentrated on reading comprehension strategies. For instance, Wong (1982) taught 120 sixth, eighth, and ninth graders with and without learning disabilities to monitor their understanding of important textual elements to foster metacognitive awareness and improve their comprehension performance. One-half of the students were randomly assigned to receive a 5-step self-questioning strategy that taught them to monitor their understanding of important text features. Results indicated that providing a reading intervention that teaches self-monitoring techniques improved metacognitive awareness and facilitated reading performance.

Nelson and Mansett-Williamson (2006) built on the knowledge gained from these prior studies by comparing explicit self-regulatory reading strategy instruction to less explicit strategy intervention to assess their impact on reading-specific self-efficacy, attributions, and effect of students with RD. Participants included 20 students with RD who were entering grades 4-8. Both interventions were delivered one-to-one over a five week period, four days a week, for one hour each day. Students who received more explicit, self-regulatory strategy intervention showed greater gains in their attributions to incorrect strategy usage for reading failure than participants in the less explicit intervention. Although not statistically significant, students receiving the less explicit intervention showed higher reading self-efficacy at posttest than students in the explicit, self-regulatory intervention, indicating that while explicit instruction in interventions may be important, the level of explicitness need not be so extensive to improve self-efficacy.
These findings, along with the findings of Wong (1982) and Mason (2004), suggest that providing strategy instruction to adolescents with reading difficulties may provide a small, positive impact on aspects of their self-concept.

Vaughn et al. (2013) provides a framework for which to provide reading instruction for students with RD in the context of middle school history that could possibly improve self-concept. Her research team focused on improving understanding of text and providing opportunities to connect new, text-based learning to previous learning. Their intervention also incorporated motivational aspects to enhance effectiveness of the intervention for adolescent with RD. These components were: 1) a comprehension canopy containing a motivational springboard and an overarching issue or question, 2) essential key vocabulary related to the unit, 3) knowledge acquisition (appropriate text-based instruction and reading), and 4) team-based learning. This study, as well as others (Hairrell et al., 2011; O’Connor et al., 2015; Swanson et al., 2014), has demonstrated positive reading outcomes for history students when peers conduct meaningful discussions or work together to complete tasks and when there are individual and group goals. It is possible that these activities assisted students in being more engaged in the content and the reading of the text. However, there was no evidence to suggest that self-concept improved.

Mason (2004) also provided strategy instruction that focused on metacognitive awareness by examining the effects of two strategic approaches to reading comprehension for 32 fifth grade poor readers. The first approach taught students to think before reading, think while reading, and think after reading (TWA), and was taught
following explicit self-regulated strategy instructional procedures. The second approach, reciprocal questioning (RQ), was taught following Cooperative ReQuest procedures. Compared with RQ students, TWA students showed significant improvement on five oral reading comprehension measures. However, Mason’s work found no significant differences between groups on measures of self-efficacy or motivation.

Meltzer, Katzir, Miller, Reddy, and Roditi (2004) also used strategy instruction but specifically examined whether it could improve self-perceptions of effort, strategy use, and academic difficulties when strategy instruction was integrated into content curriculum. Their study included 201 students with learning disabilities, 210 average achievers, and 57 teachers from 4th to 9th grade. After six months of classroom-based strategy instruction, students with learning disabilities reported more consistent use of strategies with their schoolwork and perceived themselves as struggling less in reading.

Fisher and Frey (2014) discussed earlier, sought to determine whether an after-school intervention focused on close reading procedures could improve student achievement. Close reading procedures included repeated reading, annotations, text-dependent questions, and discussions of text. Seventy-five students in grades 7 and 8 received close reading intervention. Reading outcomes of these students were compared to the outcomes of 247 students who received a traditional after-school program. Self-concept tasks addressed adolescents’ perceptions of their progress, observational comparisons, social feedback, and physiological states. Results suggested significant differences between the close reading intervention group and the control group, which had not been the case initially. When compared to the control group, students who
received the reading intervention made significant increases in reading achievement and self-concept.

Even though some studies have found strategy instruction improved the self-concept of adolescents with reading difficulties, whether it would have these effects for ELs has yet to be addressed. This was demonstrated in Shaaban’s work (2006) that examined the effects of a cooperative learning strategy to improve students' reading comprehension, vocabulary acquisition, and aspects of self-concept in a whole class setting. Forty-four grade 5 Lebanese EL students participated in the study with 22 students randomly assigned to the intervention group and the remaining 22 to the control group. The intervention group was only compared to the control group at post-test. Although the intervention group significantly improved their reading self-concept, no differences were found between the control and experimental group on vocabulary acquisition.

Section Summary: Studies that targeted enhancing reading self-concept have implemented instructional practices that required students to take a more active role in their learning. These activities included discussion, questioning, and analyzing of the text to improve reading self-concept outcomes. Few multicomponent and vocabulary reading interventions have assessed the effects of their interventions on aspects of adolescent reading self-concept. Self-concept of specific components of reading is important because adolescents may rate their overall reading ability differently than they would specific reading domains. For example, students who have deficits in the area of vocabulary may rate their overall reading ability more or less accurately than if they were
asked to rate vocabulary ability alone. Moreover, selection of instructional practices for an intervention should first be based on what has been effective for improving vocabulary knowledge, before determining its likelihood to improve self-concept. The study conducted by Vaughn et al. (2013) suggests that providing intervention that addresses the needs of students with reading difficulties within the context of history may improve their self-concept and motivation to learn history concepts.

**Components of Effective Vocabulary Instruction**

Although much of the research in the area of academic self-concepts and reading interventions has focused on global reading ability, honing in on the components of reading that have manifested as deficits in individuals with reading difficulties might be beneficial in improving academic self-concepts in a meaningful way. Once students enter their adolescent years, academic vocabulary has been shown to greatly impact reading (Vadasy & Nelson, 2012) and significantly contribute to student achievement across disciplines (Townsend et al., 2012). Academic vocabulary refers to words used in academic contexts with greater frequency than words used in nonacademic contexts, and are used across disciplines (Nagy & Townsend, 2012). Such words present a challenge for students with reading difficulties due to their abstract nature and multiple definitions (Nagy & Townsend, 2012). Thus, interventions that explicitly teach academic vocabulary have often been used to improve the vocabulary and reading comprehension of students with reading difficulties. Three key components of this evidence base include: direct instruction, association building, and student application; however, this possibility was not tested.
**Direct Instruction.** Essential vocabulary can be taught directly and learned prior to reading in order to increase understanding of the meaning of the text. Direct instruction of vocabulary is an explicit, systematic presentation of a word and its meaning (Swanson, Hoskyn, & Lee, 1999). Direct instruction for vocabulary includes teaching the meaning of the target word and facilitating active and guided participation, followed by independent application and practice (Jitendra, Edwards, Sacks, & Jacobson, 2004).

Several studies have shown direct instruction to be an effective means for teaching vocabulary. For instance, Pany and Jenkins (1982) examined the effects of three instructional strategies on the comprehension performance of fourth and fifth grade students with learning disabilities using a repeated measures randomized block factorial design. The three instructional strategies varied with regard to the amount of direct instruction students were given. Strategy one provided no direct instruction and was based on the assumption that students would acquire new word meanings from context clues (MC) within text. The meanings given strategy (MG) provided students with the meanings of preselected words as they occurred in the story. Students in the meanings practiced (MP) condition received the most direct instruction. In this condition, the meanings of preselected words were presented and practiced via flash cards prior to reading the story. Results indicated that students in the MP condition outperformed students in the MC and MG conditions on the immediate isolated vocabulary test. On the vocabulary in context test, students in the MP condition outperformed students in the MC and MG conditions as well. The effects of the three instructional conditions were contrasted with the no-meanings condition, in which students simply read the target word
printed on an index card. Results on the effectiveness of direct instruction examined in three group design investigations indicated that as direct instruction of word definitions increased, student performance on vocabulary measures improved (mean ES = 9.78; SD = 12.97, n = 3) and maintained over time (mean ES = 0.97; SD = 1.46; n = 2). The work of Pany and Jenkins led to studies implementing direct instruction strategies at the middle school level; however, the effect of this type of instruction on self-concept of vocabulary knowledge has not been studied.

**Association Building.** Nagy and Townsend (2012) conducted a review of vocabulary interventions for teaching academic vocabulary words. They concluded that rather than memorizing vocabulary, students should be provided with rich vocabulary instruction that treats vocabulary learning as a tool for understanding not only the targeted word, but the context in which the word is being used, which allows students to connect to the academic content. In their view, the ability to use a word requires understanding the targeted word’s relation to other words.

Vaughn et al. (2013) provided association building opportunities to 8th grade history students by teaching the most essential vocabulary words using simplified definition, visual representations, related words, example sentences that used the essential word, and question prompts for brief discussion of the word meaning in context (turn-and-talk prompts). After the first lesson, each lesson began with a brief review of previously taught essential words through visual representations and turn-and-talk activities. Their study suggests that a content approach that focused on text processing may be an effective teaching method in content areas. Other studies have also found
association building to be effective (McKeown, Beck, Omanson, & Pople, 1985; Stahl & Vancil, 1985); however, these studies did not assess self-concept.

**Student Application.** Additionally, research has shown that students need multiple opportunities to read and use academic vocabulary in multiple contexts (Blachowicz & Fisher, 2000; McKeown et al., 1985; Mezynski, 1983; Stahl & Fairbanks, 1986). Providing multiple exposures to words with ample opportunities for student practice in authentic contexts permits students to develop a deeper command of the academic vocabulary and strengthen conceptual knowledge. Students need these opportunities to process words deeply (Stahl & Vancil, 1985). Memorization strategies on their own are not as effective as allowing students to hear and use words several times in a variety of contexts (Stahl & Vancil, 1985). Vaughn et al. (2013) integrated essential vocabulary into texts, comprehension checks, and knowledge application activities. They found providing opportunities to revisit essential vocabulary in several contexts enabled multiple exposures of vocabulary that fostered multiple opportunities for adolescents to make connections and retain vocabulary and associated concept knowledge.

Most recently Vadasy, Sanders, and Hererra (2015) demonstrated how to provide multiple exposures to taught words. A total of 1,232 fourth- and fifth-grade students from 61 classrooms received instruction for 140 tier two vocabulary words from two grade-level novels. In order to ensure multiple exposures to words, each word appeared at least 13 times across each week’s lesson activities. All lesson components were scripted and teachers rephrased directions and prompts as needed. Results showed that providing an intervention that allowed for multiple exposures to words improved students’ vocabulary
knowledge and comprehension of content read, but again changes in self-concept were not evaluated.

Section Summary: Although recent literature points to the importance of using these strategies to improve the vocabulary of students with reading difficulty (Nagy & Townsend, 2012; Vadasy et al., 2015; Vaughn et al., 2013), less is known about whether these strategies and commensurate vocabulary improvement will lead to improvements in the academic self-concept of students with reading difficulties.

The purpose of the proposed dissertation is to explore whether vocabulary knowledge predicts vocabulary self-concept of poor readers and whether self-concept can be enhanced after receiving vocabulary intervention. The research questions are:

1. Does vocabulary knowledge predict vocabulary self-concept of 8th grade poor readers?

2. After controlling vocabulary knowledge, do student characteristics (RD and EL status) explain additional variance in self-concept?

3. Does self-concept differ based on instructional condition (e.g. students who received intervention and students who did not), after controlling for self-concept prior to instruction?

   a. Is self-concept after instruction influenced by prior self-concept?

   b. Does prior self-concept differ by instructional condition?
c. Does self-concept differ for students with and without RD, after controlling for prior self-concept?

d. Does self-concept differ for students with and without RD who received vocabulary instruction, after controlling for prior self-concept?

Chapter 3: Method

Setting

This study utilized data collected across four schools in two urban school districts, District A and District B, located in a large city located in the Inland Empire of Southern California. The two districts chosen were considered the largest and most well established school districts in the Riverside area of the Inland Empire. The two districts were chosen as they most accurately represented the Riverside population.

During the 2014-2015 school year, District A served approximately 19,480 students. The largest ethnic subgroup for this district was Hispanic (78.3%), followed by White (11%), African American (3.9%), and Asian (3.3%). Students who were American Indian/Native Alaskan, Filipino, or Pacific Islander constituted an additional 5.5 %. Approximately 81% of students were socioeconomically disadvantaged, 41.3% English Learners (ELs), and 9.8% were enrolled in Special Education programs.

District B served approximately 42,587 students. Similar to District A, the largest ethnic subgroup was Hispanic (59.9%), followed by White (24.6%) and African American (7.2%). The remaining percentage of the population identified as American Indian/Native Alaskan, Filipino, or Pacific Islander. Approximately 66% of students in
this district were socioeconomically disadvantaged, 17.3% were ELLs, and 11.0% were enrolled in Special Education programs.

Due to demographic differences that existed between districts, one school from each district was randomly assigned to have their teachers provide business as usual instruction (BAU) while the other school provided history instruction that targeted key vocabulary (vocabulary instruction). This was done in order to control for district level effects.

Participants

Participants were eighth grade students who attended one of four middle schools (referred to as School A, School B, School, Y and School Z). Schools A and B were in District A, while Schools Y and Z were in District B. School A, B, Y, and Z were similar in size ($N = 1077$, $N = 921$, $N = 1000$, and $N = 1022$, respectively), and each school’s ethnic representations were similar to proportions from their respective district. School A, B, and Z served sixth through eighth grades, while School Y’s population only included seventh and eighth graders. In all four schools, Hispanic students were the largest ethnic subgroup. English language percentages were different at each school, with 44.9% at School A, 62.5% at School B, 9.9% at School Y, and 4.2% at School Z. The majority of the ELs at each school were Spanish speaking. Special education information was not available by school, but is reported by district. Table 1 displays the demographics by district and school.

Data for the measures used were collected on 102 students from Schools A, B, Y, and Z who were identified as having reading difficulties. Participants consisted of 42 RD
and 60 non-RD students, 50 EL and 52 EO students. Nineteen students were identified as an EL student with RD. Sample demographics are shown in Table 2.

**Selection Criteria.** Students were screened when they were in seventh grade in spring of the 2013-2014 school year as part of a larger middle school reading study. Students were selected based on three indicators: 1) performance on a silent reading fluency measure (Test of Silent Contextual Reading Fluency; TOSCRF; Hammill, Wiederholt, & Allen, 2006) given during the end of their 7th grade year; 2) performance on the California English Language Development Test (CELDT); and 3) 7th grade teacher recommendations. Based on these 3 indicators, 102 students were selected. Permission letters supported by the principal, that required both parent and student consent, were distributed to parents of students in both English and Spanish. Only participants with signed parent consent and student assent were included in the study.

**Test of Silent Contextual Reading Fluency (TOSCRF).** The TOSCRF was designed to accurately identify and screen students with reading difficulties (Hammill et al., 2006). TOSCRF is a norm-referenced test intended to measure silent general reading ability and the speed with which students can recognize the individual words in a series of passages (Hammill et al., 2006). This test was administered to students in their U.S. History classes during the spring of their seventh grade year. Students were required to read short passages adapted from Gray Oral Reading Tests Fourth Edition and Gray Silent Reading Tests. The passages were arranged in rows of contextually related words, which were ordered by difficulty level. Words were presented with no spaces or punctuations between them (e.g., AYELLOWBIRDWITHBLUEWINGS) and students
were told to draw lines to separate as many words as possible (e.g., A/YELLOW/BIRD/WITH/BLUE/WINGS) in 3 minutes. Average test–retest reliability on the TOSCRF for middle school students was .84. For the purpose of this study, students who had standard scores between 70 and 90 were identified as potential participants.

**California English Language Development Test (CELDT).** English Language Learners were identified using their California English Language Development Test (CELDT) scores from seventh grade. The CELDT was created by CTB/McGraw-Hill (CTB) with the California Department of Education (CDE) Statewide Assessment Division and has been continually in development since their first field test in 2000. It assesses the listening and speaking proficiency of students whose first language was not English upon enrollment. Reliability of the CELDT has been tested using Cronbach’s index of internal consistency (Cronbach, 1951). Test reliability coefficients ranged from .76 to .88.

**Instruction Conditions**

Two conditions of instruction existed: business as usual (BAU) instruction and vocabulary instruction. One school from each district was randomly chosen to incorporate vocabulary instruction into history lessons, while the other delivered BAU history instruction. Content covered, length of history instruction time, and duration of the history units were the same for both instruction conditions. An equal number of participants were in each instruction condition. Fifty-one students received BAU
instruction and 51 students received vocabulary instruction. Pretest and posttest vocabulary measures were exactly the same for both instruction groups.

Students in the BAU condition received content instruction in their history classrooms that rarely included explicit instruction of key vocabulary concepts. Although slight variations existed, teachers of students in the BAU group were observed introducing history key terms to students, orally presenting concepts from textbook content, asking factual questions from material presented, and assigning textbook activities. Key terms were introduced by providing students with definitions of each term on PowerPoint slides as students wrote down the definition. This procedure was commonly followed by the teacher asking students if they had questions about any of the key terms. Key terms chosen by teachers were often those listed in the textbook. Introduction of key terms was followed by oral presentation of the textbook’s content and was accompanied with slides for visual support. Students also spent instructional time reading from the textbook about the events in history. Teachers asked factual questions to students with the intent to check student understanding of key concepts presented. Toward the end of each lesson and at the end of the unit, students were assigned activities that required them to answer factual and key term questions from the textbook.

In addition to the BAU instruction students in the vocabulary condition (experimental condition) received 12 additional lessons focused on vocabulary intended to aid in the understanding of major history concepts when reading text for approximately three weeks (4 days a week or until all twelve lessons had been completed). Teachers received initial training on the key components of vocabulary instruction prior to
implementation. In addition, two researchers supported teachers throughout the three weeks of instruction. Each intervention session began with the teacher providing explicit vocabulary instruction. Three main components were instrumental to the vocabulary intervention: direct instruction, association building, and student application. First, approximately three vocabulary words were introduced at the start of each session. When words were introduced, a student friendly definition was provided that did not include any form of the base word, so that students were more likely to understand the meaning of words. Definitions were read, rephrased, and discussed before students wrote down the definition. Next, similar to Vaughn et al. (2013), students also built cross-contextual associations through discussions and examples that allowed students to experience multiple exposures to words. Lastly, students were provided with prompts in the form of sentence starters, questions, and personalized examples that allowed students to orally use the word and its constructs with peers prior to reading them within the day’s history lesson. Teachers who implemented the vocabulary intervention were observed more frequently and precisely than BAU teachers to ensure fidelity of implementation.

**Measures**

The measure of intelligence was collected during the spring and data from the other 2 measures (vocabulary performance and self-rating of vocabulary performance) were collected during the fall of students eighth grade year. The same measures were given at pretest and posttest. Pretest measures data were gathered prior to the 3-week instruction period. Towards the end of the 3-week instruction period posttest data were collected.
Measure of Intelligence. The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 2011) was used to measure students’ intelligence quotient (IQ). WASI is a norm-referenced intelligence test used to measure students’ verbal, non-verbal and general cognitive ability. Vocabulary and Matrix Reasoning subtests of the WASI were given. Vocabulary subtest required students to name pictures and provide definitions for words provided by the examiner. Matrix Reasoning subtest required students to complete gridded patterns. An estimate of overall cognitive functioning was based on a composite score of the two subtests. The WASI reports reliability across all subtests to range from .81-.98, with validity of .66. Data for the WASI were administered and collected within the same school year, during the Spring of 2015.

Vocabulary Performance. Vocabulary performance was measured using orally provided student definitions of each of ten words. Definitions were scored by raters using a 3-point rubric for each vocabulary word. When no definition or an incorrect definition (e.g. discriminate means ‘to make angry’) was provided a score of 0 was assigned. Raters scored definitions as a 1 if the definition provided used an example or contained the gist of the word meaning (e.g. discriminate means ‘to hate someone because of race’ or ‘African Americans were discriminated against in the South leading to the Civil Rights movement’). Raters scored definitions as a 2 if the definition was specific with just one defining phrase (e.g., discriminate means ‘To treat someone differently based on a characteristic about them’), or if the definition provided was verbatim as taught, included more than one defining phrase, or included the definition and an example (e.g. discriminate: ‘To treat someone differently based on a characteristic about them, such as
race or religion or age’; or ‘To treat someone differently based on their characteristics, like the African Americans were in the South during the ‘60’s.’). The range of possible scores each student could receive on the measure ranged from 0-20.

Two raters participated in two three-hour training sessions on the use of the scoring rubric. Training included discussion of the overall principles and distinctions between each level of the rubric, discussion of the anchor pieces supplied for each of the levels, and practice in the use of the rubric with follow up discussion. Practice continued until raters reached 100% agreement on a set of 20% of all student responses. Responses were scored without rater knowledge of instruction condition, RD status, or pre or posttest timing. Cohen’s Kappa (Cohen, 1960) was calculated separately for the responses of each word to determine interrater agreement for double-scored assessments between the two raters. Cohen’s Kappa ranged from .71 and 1.00, indicating scores to fall within substantial to perfect agreement ranges respectively. Rater agreement across all double scored definitions was .89, falling within the almost perfect agreement range.

**Self-Rating.** Before students provided definitions, they were asked to rate their own word knowledge using a 1 to 4 numbered scale. This scale was adapted from Dale and O’Rourke’s (1981) 0 – 3 scale: (1) ‘I’ve never heard this word before’; (2) ‘I’ve heard of this word but I don’t know what it means’; (3) ‘I’ve heard of this word and I think it has something to do with ____’; and (4) ‘I know this word and it means ____’. Students who rated words as (1) ‘I’ve never heard this word before’ or (2) ‘I’ve heard of this word but I don’t know what it means’ will have scores recoded to a score of (0), indicating that they believed they didn’t know the word. Students who rated words as (3)
‘I’ve heard of this word and I think it has something to do with ___’ will have the scores recoded to a score of (1), indicating that they believed they knew the gist of the word. Students who rated their words as (4) ‘I know this word and it means ___’ will have scores recoded to a score of (2), indicating that they believed they knew what the word means.

RD Status. RD status is a dichotomous variable consisting of a group of students who were identified as having RD and a group of students who were not identified as having RD. Student who were identified by the school district as having a learning disability in the area of reading, were identified by teachers as having low performance in history class, and fell within the 70 to 90 standard score range on the TOSCRF were considered RD. Students who were identified by teachers as having low performance in their history class, and had a standard score between 70 to 90 on the TOSCRF were considered non-RD for this study. A total of 42 students in the sample were identified as having RD and 60 identified as non-RD. Students with RD were coded as 1 and students without RD were coded as 0.

English Learner Status. English Learner status is a dichotomous variable consisting of a group of students who come from homes where Spanish is their first language and English is their second language (e.g., EL), and a group of students for whom English is their first language (e.g., EO). Students who took the CELDT test in seventh grade and scored from 1-5 were considered to be EL. Students who took the CELDT but were redesignated as English fluent or who were considered EO by school records and did not take the CELDT test were considered EO. The sample consisted of 50
students in the EL group and 52 in the EO group. EL was coded as 1 and EO was coded as 0.

**Data Analyses**

To address research questions 1 and 2, hierarchical multiple regression was employed (Field, 2010). Hierarchical multiple regression enables the researcher to enter variables into regression analyses in stages based on theory in order to control for the effects of covariates or to test the effects of certain predictors independently from the influence of other predictors. In the present study, for instance, the use of hierarchical regression allows for the ability to determine (a) the extent to which prior vocabulary knowledge influences prior vocabulary self-concept, b) whether there are differences between the vocabulary self-concept of EL and EO students, after controlling for vocabulary knowledge, c) whether there are differences between the vocabulary self-concept of students with and without RD after controlling for vocabulary knowledge, and d) the extent to which factors such as RD and EL status contribute to the relationship found between vocabulary knowledge and vocabulary self-concept.

The present analysis treats self-concept as a continuous interval variable rather than an ordinal categorical variable. While self-concept and self-assessment measures can be considered categorical, current self-concept literature has consistently treated self-concept measures created from rating scales as a continuous variable in analyses (Calsyn & Kenny, 1977; Heyman, 1990; Kenny, 1979; Marsh & Craven, 2006; Marsh & Martin, 2011; Möller, Retelsdorf, Köller, & Marsh, 2011; Muijs, 1997; Retelsdorf, Köller, & Möller, 2014). It could be argued that parametric tests such as linear multiple regression
are not appropriate for self-rating variables because the structure of rating scale data are ordinal. However, other researchers have contended that although self-rating and Likert scales are technically ordinal, there is an underlying continuous nature to the data where equal distance between the categories is assumed (Harpe, 2015; Murray, 2013). The main contention in choosing a parametric test over non-parametric is that analysis may violate assumptions of normality and linearity in the data, leading to different results than when using non-parametric tests, such as ordinal logistic regression (Field, 2010). Yet, Norman (2010) reviewed studies dating back to the 1930s to demonstrate how parametric statistics are robust to violations of these particular assumptions. Norman’s (2010) findings are similar to findings of other researchers who have found self-rating and Likert scale data to yield similar results when using parametric and non-parametric tests without affecting conclusions drawn (Harpe, 2015; Murray, 2013).

Hierarchical linear models are often preferred when nested data exist. In the current study, students are nested in classrooms and classrooms are nested in schools. However, there were too few classrooms and schools to consider using such a model. To address the issue of students being nested within schools of varying demographics, data were aggregated by school and differences by school were reported using a one-way ANOVA. Tabachnick and Fidell (2013) provide a formula for calculating regression sample size requirements taking into account the number of variables being used: \( N > 50 + 8m \) (where \( m \)=number of independent variables). With 3 predictors the sample size meets the requirements \( (102 > 50+8(3)) \). The equations for this analysis are:

Research question 1:
$Y_{self-rating_i} = b_0 + b_1 \text{vocabulary knowledge}_i + \varepsilon_i$

Research question 2:

$Y_{self-rating_i} = b_0 + b_1 \text{vocabulary knowledge}_i + b_2 \text{EL status}_i + b_3 \text{RD status}_i + b_4 \text{vocabulary knowledge}_i \times \text{EL status}_i + b_5 \text{vocabulary knowledge}_i \times \text{RD status}_i + b_6 \text{vocabulary knowledge}_i \times \text{EL status}_i \times \text{RD status}_i + \varepsilon_i$

To address research question 3, a one-way analysis of covariance (ANCOVA) was used. The outcome variable is the z-score of the posttest vocabulary self-rating and is continuous. Two independent variables were assessed: instruction condition and RD status. Intervention status has two levels (e.g. vocabulary instruction, $n=51$; BAU instruction, $n=51$). Student RD status also has two levels (e.g. RD, $n=42$; non-RD, $n=60$). The covariate in the model is the z-score of the pretest vocabulary self-rating in order to control for differences in vocabulary self-rating between the levels of the independent variables at pretest. The F-ratio and corresponding p-value are reported. RD status descriptive statistics (e.g. means and standard deviations at pre-and post-test), as well as pre-to post-test differences (e.g. using t-test) are reported.

**Nested Data**

This analysis omits information about aggregated levels of self-concept, so we lose some explained variance. Since data were collected at the beginning of the school year before academic instruction took place, it was assumed that any variance in self-rating that was not explained by the model would be due to school level factors (i.e., students nested in schools) and not class level factors, (i.e., students nested in classrooms). Thus, student level observations could be dependent on variances found
between schools, violating the assumption of independent observations. Cluster correlation was attempted using the interclass correlation (ICC). The interclass correlation coefficient (ICC), or the proportion of the total variance in self-rating that could be explained by schools, was very low, ICC=0.01. However, the ICC can be estimated poorly if the number of clusters is small, as in the case of the current data (N=4) (Feng et al., 2001). Therefore, descriptive statistics that aggregate pretest and posttest vocabulary self-rating by school are provided to account for differences based on school attended.

Chapter 4: Results

WASI IQ data are presented to provide an estimated ability of the students included in the study. The mean WASI score of the total sample of students was 82. An average score on the WASI is 100 with approximately 95% of IQ scores falling between 70 to 130. Table 3 reports the mean for both the WASI matrix and vocabulary subtests, as well as the total IQ scores for the sample by student characteristics (i.e., RD status, EL status). An independent samples t-test revealed no statistically significant differences between the IQ of students with RD and students who were poor readers without RD, t (100) = 1.79, p = .08. Additional independent sample t-tests showed no differences were between students with and without RD on the vocabulary, t (100) = 1.66, p = .10, or matrix subtests, t (100) = 0.50, p = .62. Independent samples t-test comparing the mean IQ of students who are EL to the mean IQ of students who are EO revealed statistically significant differences on the vocabulary subtest, t (100) = 2.92, p < .001, and total IQ, t (100) = 2.24, p < .05. Adolescents who are EL had lower vocabulary subtest (M_{EL} =
30.70, SD = 11.69; $M_{EO} = 37.31, SD = 11.19$) and total IQ scores when compared to EO adolescents ($M_{EL} = 79.32, SD = 11.24; M_{EO} = 84.77, SD = 13.19$).

Descriptive statistics were also generated at the school level for adolescent self-ratings. The vocabulary self-rating mean for the entire sample at pretest was 22.87. Schools A and Y were randomly assigned to receive vocabulary instruction, while Schools B and Z received BAU instruction. Results of a one-way ANOVA revealed no statistically significant differences between the vocabulary self-rating of the four schools prior to intervention, $F(3, 99) = 1.48, p = .22$. When self-rating was aggregated by schools, centering each school’s averaged vocabulary self-rating around the grand mean, School A was .21 of a standard deviation below the grand mean ($M = 21.71$), School B was .09 of a standard deviation below the grand mean ($M = 22.38$), School Y was .30 of a standard deviation above the grand mean ($M = 24.55$), and School Z was .07 of a standard deviation below the grand mean ($M = 22.47$).

The vocabulary self-rating mean for the entire sample after history instruction was 27.48. Results of a one-way ANOVA revealed statistically significant differences existed between the vocabulary self-rating of the four schools at posttest, $F(3, 99) = 8.27, p < .001$. Vocabulary self-rating aggregated by schools showed School Z was .43 standard deviations below the grand mean ($M = 25.00$), School A was .34 standard deviations above the grand mean ($M = 29.44$), School Y was .44 standard deviations above the grand mean ($M = 30.03$), and School B was .57 standard deviations below the grand mean ($M = 24.19$). Differences between the two schools were found within each district. Table 4 shows mean of each school based on instructional condition.
Results of Post Hoc analysis with a Bonferroni correction indicated a statistically significant difference between the vocabulary self-rating of adolescents at School Y and School Z, \( p < .05 \), with students in the vocabulary instruction condition at School Y having a higher mean self-rating than students who received BAU instruction at School Z. A statistically significant difference was found between the mean vocabulary self-rating of adolescents at School A and School B, \( p < .05 \), indicating that School A students who received vocabulary instruction had higher vocabulary self-rating than School B students who received BAU instruction. In addition, across district differences were found in the self-concept means of two schools. A statistically significant difference was found between the mean vocabulary self-rating of School B students who received BAU instruction and School Y students who received vocabulary instruction, \( p < .05 \), with students at School Y having higher vocabulary self-rating than students at School B. The school with the lowest percentage of EL students attending their school, School Y, had the highest vocabulary self-rating both before and after intervention. School B had the lowest self-rating out of all the schools prior to and after instruction. Of particular interest was the relationship between vocabulary knowledge and self-rating and student characteristics that may contribute to vocabulary knowledge prior to any intervention.

**Regression Analysis**

A hierarchical multiple regression was employed to determine whether a) current vocabulary knowledge predicts vocabulary self-concept, and b) whether student characteristics (RD and EL status) predict vocabulary self-concept after controlling for vocabulary knowledge. The pretest vocabulary rating scores were used for the dependent
variable in the model, which was referred to as vocabulary self-rating. The continuous independent variable was pretest vocabulary knowledge, referred to as vocabulary knowledge. The two dichotomous variables were RD status (RD, non-RD) and EL status (EL, EO).

**Assumptions.** Several assumptions were assessed to ensure data met criterion for running this type of hierarchical regression: independence, linearity, homoscedasticity, non-multicollinearity, normality, and no outliers (Field, 2010). Independence of observations (i.e., independence of residuals) can be checked using Durbin-Watson statistic. A Durbin-Watson value of 2 suggests no autocorrelation and an independence of residuals (Fields, 2010); therefore, a value between 1.5 and 2.5 would indicate no autocorrelation. Although results of the Durbin-Watson across all three variables indicated that this assumption was met (d=1.89), the issue of nested data meant a violation of this assumption. Regression analysis was still carried out as the analysis can be robust to violations of this particular assumption (Woltman, Feldstain, MacKay, & Rocci, 2012).

The assumption of linearity assumes a linear relationship exists between the dependent variable and the independent variable for each group of each dichotomous moderator variable (Tabachnick & Fidell, 2013). This assumption was checked using a normal P-P Plot displaying the linear relationship between the observed and predicted values for each continuous variable. The vocabulary self-rating variable met this assumption as the relationship between the observed and predicted values was close to a straight line with no serious deviations from this line. However, for the vocabulary
knowledge variable the assumption of linearity was not met. Residuals appeared to be more spread at the bottom and did not fall along the straight line. This was an indication that the vocabulary knowledge variable may need to be transformed. However, the remaining assumptions were checked prior to considering this option.

To meet the assumption of homoscedasticity -- the error variances are the same for all combinations of independent and moderator variables -- the studentized residuals were plotted against the unstandardized predicted values for both groups of each dichotomous variable (Tachnick & Fidell, 2013). The Q-Q Plot was used to check homoscedasticity and this assumption was again met for self-rating, but not for vocabulary knowledge; the vocabulary knowledge variable displayed values that did not fall close to zero and had an inconsistent pattern across the x-axis.

The assumption of non-multicollinearity was assessed to determine whether independent variables were highly correlated with each other ($r=.90$; Tabachnick & Fidell, 2013). To check for multicollinearity, inspection of correlation coefficients and Tolerance, and variance inflation factor (VIF) values were assessed. All independent variables shared very small correlations with one another. Significant correlations ranged from -.18 to .49. Tolerance values ranged from .91 to 1.00, and VIF values ranged from 1.00 to 1.10, meeting the assumption of non-multicollinearity.

Residuals were checked to see if they were approximately normally distributed. This assumption was assessed using the Shapiro-Wilk test for normality. The Shapiro Wilks test indicated that the assumption of normality was met for self-rating, $p=.66$, but was again not met for vocabulary knowledge, $p<.001$. A histogram of the normal
distribution along with the skewness was examined for the vocabulary knowledge variable, which indicated that this variable was positively skewed.

Lastly, the assumption of no outliers was checked to ensure no highly influential points would leverage the outcome of the regression. Two outliers were found in the vocabulary knowledge predictor variable but none were found in the self-rating variable. Outliers were considered to be z-scores below -3.3 and above 3.3 for any of the variables utilized (Field, 2010). The first student had a z-score of 3.6, while the second had a z-score of 4.5 on the vocabulary knowledge variable. Mahalanobis Distance for the second students’ self-rating was 17.20, higher than the critical value of 16.27; this test indicated one significant outlier in the vocabulary knowledge variable. Additionally, the Cook’s Distance was checked to determine whether these scores would cause undue influence and no scores were identified as having scores that leveraged the outcome of the regression. The maximum value of the Cook’s Distance was .09, which is less than 1; this suggests no major issues.

Results of these assumption analyses led to a log transformation of the vocabulary knowledge variable to reduce positive skewness and improve the linearity, normality, and homoscedasticity of residuals. Since there were values of 0 for this variable, a 1 was added to the values of each case prior to the log transformation (Field, 2010). After the log transformation of the vocabulary knowledge variable the same regression assumptions were again checked. Linearity was improved, with the log transformation of vocabulary knowledge variable P-P Plots showing a better linear relationship between the observed and predicted values because values were closer to a straight line. Although
Shapiro Wilks had a p-value less than .001, normality was also improved as the log skewness was .58 and kurtosis was -.91 as opposed to 1.80 and 3.58 respectively. The log transformation of vocabulary knowledge Q-Q plots showed less deviation from zero indicating better homoscedasticity of residuals. Finally, when analyzing the z-scores, Mahalanobis Distance, and Cook’s Distance, no outliers were found in the data when the log transformation of vocabulary knowledge variable was used.

**Descriptive Statistics.** Prior to conducting the regression, descriptive data were generated for the independent variables (See Table 5). Adolescents had a mean vocabulary knowledge of 1.37 (SD = 1.88). Students with RD had a mean vocabulary knowledge score of 0.74 (SD = 1.34), while students without RD had a mean vocabulary knowledge score of 1.82 (SD = 2.07). Students who were EL had a mean vocabulary knowledge score of 1.28 (SD = 1.76), while EO students had a mean vocabulary knowledge score of 1.46 (SD = 1.99). The mean vocabulary self-rating for students without RD was higher than students with RD (\(M_{RD} = 21.55, SD_{RD} = 5.66; M_{non-RD} = 23.80, SD_{non-RD} = 5.27\)). Means for EL status indicated that EO students had higher vocabulary knowledge than EL students (\(M_{EL} = 21.94, SD_{EL} = 5.07; M_{EO} = 23.77, SD_{EO} = 5.83\)).

Prior to running the regression, correlations were also analyzed. Table 6 reports the results of the correlations between each variable used in the regression. Vocabulary self-rating shared the highest correlation with vocabulary knowledge (\(r = .26\)), when compared to its relationship to RD status (\(r = -.20\)) and EL status (\(r = -.17\)).
Results. Table 7 displays the results of the hierarchical regression. In step 1 of the hierarchical regression the standardized log transformed vocabulary knowledge variable was included as a continuous independent variable to determine whether it predicted standardized vocabulary self-rating, which was also treated as a continuous variable. A significant regression equation was found ($F(1,100) = 7.50, p < .01$), with an $R^2$ of .07. Adolescents’ predicted self-rating was equal to the following: $Y_{\text{self-rating}} = .26(\text{vocabulary knowledge}) + \varepsilon_i$. The unstandardized partial slope (.26) and standardized partial slope (.26) were statistically different from 0 ($t=2.74, p< .01$); with every one-point increase in the log of vocabulary knowledge, vocabulary self-rating increased by .26 of a unit. Findings indicated vocabulary knowledge was a significant predictor of vocabulary self-rating and accounted for 7% of the variance in vocabulary self-rating.

In step 2 RD and EL status variables were added to the regression model to explore whether student characteristics explained additional variation in vocabulary self-rating, after controlling for vocabulary knowledge. A significant regression equation was found ($F(3, 98) = 4.39, p<.01$), with an $R^2$ of .11. Adolescents’ predicted self-rating was equal to: $- .96 + .21(\text{vocabulary knowledge}) + .30 (\text{RD status}) + .33 (\text{EL status}) + \varepsilon_i$, where RD status was coded as 0=Non-RD, 1=RD, and EL status was coded as 0=EO, 1=EL. Adolescents’ vocabulary self-rating increased .21 of a point for every one-point increase on vocabulary knowledge. Students without RD had self-rating that were .30 of a point higher than students with RD, and EO students had self-rating that were .33 of a point higher than EL students. At this stage of the regression approximately 11% of the variance in vocabulary self-rating could be explained by vocabulary knowledge, with an
additional 4% of the variance in vocabulary self-rating being explained by the addition of student characteristics; however, RD status and EL status collectively did not significantly explain additional variation found in self-rating scores beyond what was explained by vocabulary knowledge, \( \Delta F (2, 98) = 2.31, \Delta R^2 = .04, p = .11 \). The unstandardized partial slope (.21) and partial slopes (.21) for vocabulary knowledge were statistically significant from 0 \( (t = 2.06, p < .05) \); indicating vocabulary knowledge was still a significant predictor of vocabulary self-rating after student characteristics were entered into the model. The unstandardized partial slope (-.30) and partial slopes (-.15) for RD status were not statistically significant from 0 \( (t = -1.45, p = .15) \); indicating RD status was not a significant predictor of vocabulary self-rating. The unstandardized partial slope (-.33) and partial slopes (-.16) for EL status were not statistically significant from 0 \( (t = -1.71, p = .09) \); indicating EL status was not a significant predictor of vocabulary self-rating. Estimated power to predict multiple \( R^2 \) was high, 0.97 (Faul, Erdfelder, Lang, & Buchner, 2013).

**Analysis of Covariance**

A 2 x 2 two-way ANCOVA was conducted to determine if mean vocabulary self-rating differed based on instructional condition (vocabulary instruction vs. BAU instruction) and RD status (RD vs. non-RD), while controlling for vocabulary self-rating at pretest. The dependent variable, posttest self-rating, was measured as continuous. The continuous covariate, pretest self-rating, was used to control for differences found in posttest self-rating that could be explained by self-rating prior to instruction. Two dichotomous independent variables were analyzed: instructional condition (vocabulary
instruction, BAU instruction) and RD status (RD, non-RD). Data were scanned for missingness. The assumptions of independence, linearity, normality, homogeneity of variance, outliers, adequate cell size, and homogeneity of regression of slopes were checked for all variables prior to the analysis.

**Assumptions.** The assumption of independence of errors could not be assumed. Schools were randomly assigned to an instructional condition. As discussed earlier, students were nested in schools, which violates the assumption of independence of errors. However, ANCOVA analysis was still performed since aggregated data were reported to account for this violation.

ANCOVA also assumes linearity, or that the covariate is linearly related to the dependent variable at each level of the independent variable. This was assessed by checking for significant correlations between the pre- and posttest vocabulary self-rating variables for each level of instruction and RD status. Correlations between pre- and posttest self-rating for BAU ($r=.60$) and vocabulary ($r=.51$) instruction groups were moderate and significant. Both students with and without RD had significant correlations between their pretest and posttest self-rating; however, this relationship was small for students with RD ($r=.31$) and moderate for students without RD ($r=.62$) (Cohen, 1988).

The assumption of normality was met using the Shapiro Wilks test of normality. Shapiro Wilks for vocabulary self-rating at pretest ($p=.68$), and posttest, ($p=.28$), indicated that data came from a normal distribution. Additionally, Shapiro Wilks tests indicated that pretest vocabulary ($p=.69$) and BAU instruction groups ($p=.62$) were normally distributed. Shapiro Wilks tests also indicated that posttest vocabulary ($p=.51$)
and BAU instruction groups \((p=.32)\), were also normally distributed. Results of the Q-Q plots of observed self-rating plotted against predicted self-rating for each instruction condition and RD group at both pretest and posttest demonstrated linearity, with all data points close to the line. In addition, the assumption of homoscedasticity was checked by plotting a scatterplot of the standardized residuals against the predicted values for pretest and posttest self-rating variables. Values for pretest and posttest at each level of instruction and RD status appeared to have the same pattern of dispersion. Homogeneity of variances was tested using Levene's test for homogeneity of variances (Field, 2010). Levene's test of homogeneity indicated that the variance in post instruction self-rating scores was equal across instruction conditions and RD groups \((p=.31)\).

Although boxplots--discussed later indicated there may be outliers in posttest data when disaggregated by instruction condition and RD status, data were checked for outliers by assessing the standard scores of each variable. No outliers, scores 3.5 standard deviations away from the mean, were found in the data (Field, 2010). Means and 5% trimmed means were also assessed. Means that were different from the 5% trimmed mean would indicate outliers in the data exist that would significantly influence the results of the ANCOVA (Tabachnick & Fidell, 2013). Means and 5% trimmed means were very similar to one another for pretest and posttest vocabulary self-rating variables at each level of instruction and RD status groups. Means were almost identical to the 5% trimmed mean. Cook’s Distance had no value that exceeded .09; values exceeding 1 would be considered influential outliers (Tabachnick & Fidell, 2013). Results of these
two test indicated that none of the highest or lowest scores would have a significant impact on the results of the ANCOVA.

*Cell sizes* were also checked because ANCOVA assumes there is adequate cell count when running analysis of variances when categorical variables are present (Field, 2010; Tabachnick & Fidell, 2013). Cell sizes below 5 would be considered too small to be generalizable for this analysis (Field, 2010; Tabachnick & Fidell, 2013). The cell size for BAU instruction was 51 and vocabulary instruction was 51. The cell size for students with RD in the BAU group was 21, and the cell size for students without RD in the BAU condition was 30. The cell size for students with RD in the vocabulary group was 21, and the cell size for students without RD in the vocabulary condition was 30. The cell size for all RD students was 42 and the cell size for all students without RD was 60. All cell sizes were above 5. In addition, the sample sizes of each cell were also deemed sufficient to retain adequate power. Effect size for an ANCOVA of two levels and one covariate was determined using power analysis. Power analysis was conducted with a sample size of 102, an alpha of 0.05, and a power of 0.80. This analysis had high probability of detecting a medium effect size ($f = 0.28$) (Faul et al., 2013).

*Homogeneity of regression slopes* assumes that the relationship between pretest self-rating, the covariate, and posttest self-rating, the outcome, are relatively the same between the two intervention and the two RD status groups. Correlations of the two intervention groups were similar. However, the correlation for students with RD was smaller than the correlation for students without RD. No interaction was present between
instruction conditions, or RD status groups, suggesting no violation of homogeneity of regression slopes.

**Descriptive Statistics.** Prior to running the ANCOVA descriptive analyses were conducted for pre-and posttest vocabulary self-rating (See Table 8). Figure 2 displays the boxplots of pretest vocabulary self-rating disaggregated by: a) instruction condition, b) RD status, and c) instruction by RD status. Pretest data were first disaggregated by instruction status (See boxplot A of Figure 2). The pretest vocabulary self-rating score range was slightly larger for the vocabulary instruction group when compared to the BAU group. Medians for both instructional groups were the similar, but the vocabulary instruction group had more variation within the scores than did the BAU group ($Md_{vocab} = 23.00, s^2 = 32.60; Md_{BAU} = 23.00, s^2 = 28.93$). The interquartile range (IQR) for the two instruction groups was also similar. Values that were identified as potential outliers through preliminary analysis are represented by circles for each boxplot.

Next, data were disaggregated by RD status. The pretest vocabulary self-rating minimum and maximum scores were slightly lower for students with RD when compared to their non-RD peers. The range was the same for the RD group as the non-RD group. Medians for both RD status groups were similar, but students with RD had greater variation within self-rating than their non-RD peers ($Md_{RD} = 21.50, s^2 = 32.06; Md_{NonRD} = 23.50, s^2 = 27.79$). In addition, students with RD had a larger IQR than their non-RD peers. The IQR for students with RD was from 16.75 to 27, while the IQR for non RD students was from 20 to 26.75.
Pretest self-rating was also disaggregated by both instruction and RD status (Shown in boxplot C of Figure 2). At pretest, adolescents who were RD and in the BAU condition had larger self-rating range \((\text{Range} = 25)\) than adolescents who were non-RD and in the BAU condition \((\text{Range} = 18)\); Scores ranged from 11 to 36 for students with RD in the BAU group and from 14 to 32 for non-RD students in the BAU group. Median scores for students with RD in the BAU instruction condition \((Mdn = 23; \ s^2 = 36.36)\) were similar to students without RD in the BAU instruction condition \((Mdn = 22.50; \ s^2 = 24.71)\), although greater variance existed within the self-rating of students who were RD in the BAU group. The IQR for students with RD who were in the BAU instruction condition was similar to students without RD in the BAU instruction group.

Adolescents who were identified as having RD and in the vocabulary instruction condition had a smaller self-rating score range \((\text{Range} = 16)\) than adolescents without RD and in the vocabulary instruction condition \((\text{Range} = 22)\). Scores ranged from 12 to 28 for adolescents with RD in the vocabulary condition and from 17 to 39 for non-RD adolescents in the vocabulary condition. The median score for students with RD in the vocabulary instruction condition \((Mdn = 20; \ s^2 = 27.73)\) was smaller and scores had less variance in comparison to students without RD in the vocabulary instruction group \((Mdn = 24; \ s^2 = 30.15)\). The IQR for students with RD who were in the vocabulary instruction group was lower than students without RD in the BAU instruction group. The IQR for students with RD in the vocabulary instruction condition was from 15.50 to 26 and for students without RD in the vocabulary instruction was from 20.75 to 28.50.
Figure 3 displays boxplots of posttest vocabulary self-rating again disaggregated: a) instruction condition, b) RD status, and c) instruction by RD status. Boxplot A of Figure 3 displays vocabulary self-rating disaggregated by instructional condition. The minimum posttest vocabulary self-rating for the vocabulary instruction group was 18 and the maximum rating was 40, in comparison to the BAU groups’ minimum rating of 15 and maximum of 35. The range was slightly larger for the vocabulary instruction group when compared to the BAU group. Medians for the two instruction groups were not the same; the posttest median for the vocabulary instruction group was higher than the BAU and with slightly more variation ($Md_{vocab} = 31.00, s^2 = 26.09; Md_{BAU} = 23.00, s^2 = 24.17$). The IQR for the two instruction groups was larger than the BAU group. The IQR for the vocabulary instruction group was 27 to 34.50, while the IQR for the BAU group was from 22 to 28.

In boxplot B of Figure 3 posttest self-rating was disaggregated by RD status. Medians for both RD status groups were similar, but students with RD had greater variation within self-rating than their non-RD peers ($Md_{RD} = 27.00, s^2 = 34.12; Md_{NonRD} = 28.00, s^2 = 33.64$). The IQR for students with RD was from 24.50 to 30.50, while the IQR for non-RD students was from 23.75 to 32.00. Lastly, boxplot C of Figure 3 shows posttest self-rating disaggregated by both instruction condition and RD status. At posttest scores ranged from 15 to 35 for students with RD in the BAU group and from 15 to 33 for students without RD in the BAU group. Median scores and variance for students with RD in the BAU instruction condition ($Md = 25; s^2 = 24.23$) were similar to students without RD in the BAU instruction condition ($Md = 25.50; s^2 = 24.92$).
Students identified as RD who received vocabulary instruction had a self-rating range of 22, whereas adolescents without RD who received vocabulary instruction had a range of 19. Scores ranged from 18 to 40 for adolescents with RD in the vocabulary group and from 19 to 38 for non-RD adolescents in the vocabulary group. The median score for students with RD in the vocabulary instruction group ($Mdn = 28.50; s^2 = 30.51$) was smaller and scores had greater variance when compared to students without RD in the vocabulary instruction group ($Mdn = 31; s^2 = 23.39$). The IQR differed for students with and without RD who were in the vocabulary instruction group. The IQR for vocabulary instruction students with RD was from 25.25 to 34 and for vocabulary instruction non-RD students was from 28 to 35.

**Results.** Table 9 displays the ANCOVA table results. Results of the ANCOVA suggested a statistically significant effect of the covariate, pretest vocabulary self-rating (vocabulary self-rating prior to instruction), on the dependent variable, posttest vocabulary self-rating (vocabulary self-rating after instruction), $F (1, 99) = 40.12, p < .001$. There was a statistically significant effect for instructional condition ($F (1, 99) = 44.88, p < .001$, partial $\eta^2 = .32$, observed power = 1.00), with a large effect size and strong power (partial $\eta^2 = .32$, observed power = 1.00). The effect size suggested that approximately 32% of the variance in vocabulary self-rating can be accounted for by instructional condition, when controlling for pretest vocabulary self-rating. Adjusted means for the main effect of instruction condition on vocabulary self-rating indicated that adolescents who received vocabulary instruction had a higher vocabulary self-rating ($M = 30.47, SD = 5.11$) than adolescents who received BAU instruction ($M=24.56, SD=4.92$).
The effect of RD status on vocabulary self-rating was non-significant after controlling for pretest vocabulary self-rating (F (1, 99) = .18, p = .67, partial η² = .00, observed power = .07), indicating that the adjusted means for vocabulary self-rating were essentially the same regardless of RD status (M_{RD} = 26.98, SD = 5.84; M_{non-RD} = 27.84, SD = 5.80). The interaction effect was non-significant, (F (1, 99) = .30, p = .58, partial η² = .00, observed power = .09), indicating that there was no difference between the self-rating of adolescents in either instruction condition based on RD status (RD, non-RD). Table 10 reports the means and standard deviations of the analysis.

An ANOVA was conducted at pre-and post-test to determine whether there was a difference between the self-rating of students with and without RD based on EL status. Although findings approached significance, there was no statistically significant difference in self-rating at pretest based on EL status, (F (1, 101) = 3.93, p = .50, partial η² = .050), indicating that EL and EO students had a similar mean self-rating. There was also no EL by RD interaction, (F (1, 101) = .91 p = .35, partial η² = .14). These findings suggest no statistically significant difference between the vocabulary self-rating of EL adolescents with and without RD prior to instruction. They also suggest no significant difference between the vocabulary self-rating of EO students with and without RD prior to instruction.

There was also no statistically significant difference in post-instruction self-rating based on EL status, (F (1, 98) = 2.60, p = .11, partial η² = .36), and there was no significant EL by RD interaction, (F (1, 198) = 2.19, p = .14, partial η² = .31). Again, no significant difference was found in vocabulary self-rating EL adolescents with and
without RD prior to instruction. In addition, no statistically significant difference was found between the self-rating of EO adolescents with and without RD prior to instruction. These findings suggest that EL status had little bearing on the self-concept of students with RD prior to or after instruction.

Chapter 5: Discussion

The present study examined whether vocabulary knowledge of adolescent poor readers predicts their vocabulary self-concept. Adolescents’ cumulative scores on ten U.S. history words that frequently appeared in textbooks were used to predict their vocabulary self-concept (i.e., how well adolescents believed they knew these words). This study extended prior work by exploring a specific component of reading (i.e., vocabulary) that contributed to these adolescents having reading levels below what was needed in order to engage in history text.

Prior studies indicated that reading achievement predicts reading self-concept, and thus it was expected that vocabulary knowledge would predict vocabulary self-concept, as measured in this study by self-rating (Marsh, 1990; Marsh & Craven, 2006; Retelsdorf et al., 2014). Skill development theory (Calsyn & Kenny, 1977) would also suggest that an adolescent’s vocabulary knowledge causes their vocabulary self-concept. While the present study could not provide evidence to support or dispute a claim that vocabulary knowledge “causes” an adolescent’s vocabulary self-concept, results indicated that adolescent poor readers’ vocabulary scores were in fact good predictors of their vocabulary self-concept. Adolescents who had high knowledge of vocabulary words tended to also rate themselves as having high understanding of vocabulary words. The
inverse was also true. This seems to suggest that at some level students’ beliefs about their understanding of vocabulary were accurate representations of current levels of vocabulary knowledge.

A second aim of the present research was to explore whether a three-week vocabulary intervention in U.S. history classrooms, designed to improve academic vocabulary, could in turn improve adolescent poor readers’ self-concept surrounding the same ten frequently used US history vocabulary words. Results showed students who received vocabulary instruction had a more positive self-concept of their vocabulary than their peers who did not receive vocabulary instruction.

**Self-Concept Prior to Instruction**

The present study found vocabulary knowledge prior to instruction predicts an adolescent’s vocabulary self-concept prior to instruction. Past studies have found a small positive relationship existed between reading achievement broadly and the self-concept of students with RD (Chapman, 1988; Meltzer et al., 1988; Polychroni et al., 2006). The present study found that the strength of the achievement-to-self-concept relationship was similar ($R^2 = .07$) for vocabulary as what has been reported for reading. In addition, this relationship was found for most students with reading difficulties (RD and non-RD) in the present study.

Also assessed was whether student characteristics explained additional variance found in self-concept beyond that explained by vocabulary knowledge. Adolescents with RD have been reported to have lower reading self-concept than those without RD. However, after accounting for current levels of vocabulary knowledge, differences in RD
status did not significantly explain the differences found in the degree to which students believed they did or did not know the 10 vocabulary words. Findings of the present study could be an indication that the differences found between RD and non-RD peers are more likely to be found when students are compared to non-RD peers that are typically achieving. However, more research should be conducted to adequately assess whether differences in specific areas of reading self-concept of adolescents are due to RD or low performance.

This study also hypothesized that EL students may have a lower self-concept than their peers due to the fact that they are learning a second language. After accounting for current levels of vocabulary knowledge, students did not seem to have differences in self-concept that could be explained by differences in EL status. Perhaps one’s academic vocabulary development is a greater determinant of their vocabulary self-concept than whether they are an EL or EO. Vocabulary knowledge may have more to do with one’s self-concept than their EL status, suggesting that language is not as much of a factor in one’s vocabulary self-concept as one’s knowledge of the vocabulary words. Thus it would appear that development of vocabulary may be needed to improve the self-concept of students regardless of EL status.

Vocabulary Instruction

It was hypothesized that there would be a difference between the self-concept of poor readers who received vocabulary intervention and those who received BAU instruction, with adolescents who received the vocabulary instruction having a more enhanced vocabulary self-concept after instruction than students who did not (BAU).
This supposition was based on the skill-development theory (Calsyn & Kenny, 1977), which as stated earlier has been tested in studies using structural equation modeling, correlational data, and intervention procedures on populations of typically achieving adolescents and adolescents with RD (Marsh, 1990; Marsh & Craven, 2006; Retelsdorf et al., 2014). Prior studies suggest that providing skill-development through reading intervention in turn can positively affect the reading self-concept of adolescents with reading difficulties. Like Fisher and Frey (2014), who found that instruction generated a 4-point increase in self-concept, this current study found instruction generated a 7-point increase in self-concept.

In the present study, adolescent poor readers who received vocabulary instruction had a higher self-concept than adolescent poor readers who did not receive vocabulary instruction. This was evident after accounting for prior vocabulary self-concept. This finding suggests that providing vocabulary instruction can improve adolescents’ perception of the academic words they do and do not know. It is possible that these enhanced perceptions surfaced because the act of learning made adolescents more confident that they would know more vocabulary, regardless of whether they knew more academic vocabulary. However, adolescents who received vocabulary instruction had higher post-instruction knowledge of the 10 vocabulary words ($M = 5.45$) than adolescents who received BAU instruction ($M = 2.94$), $F (1, 101) = 17.34$, $p < .001$. This additional finding suggests that the more likely explanation is that students' beliefs about their vocabulary knowledge increased as their depth and breadth of vocabulary expanded. Providing vocabulary instruction in the manner discussed here is likely to in turn improve
self-concept of academic vocabulary essential to history content. Thus, the effective teaching of essential vocabulary in content areas may have dual benefits for both an adolescent’s academic vocabulary development and vocabulary self-concept.

**RD Status and Instruction**

A substantial literature base has found differences in reading self-concept between adolescent students with RD and their typically achieving non-RD peers (Polychroni et al., 2006; Prout et al., 1992). Therefore, it was hypothesized that differences in vocabulary self-concept would be found between poor readers with and without RD. Poor readers who do not receive special education services are a population of students not often addressed in the literature, especially in middle school, which makes the present study an important one for adding to the literature base. Chapman’s (1988) meta-analysis, followed by the work of others (Grum et al., 2004; Polychroni et al., 2006; Prout et al., 1992), found special education students had a lower self-concept than their typically achieving peers. What has been unclear was whether this finding was due to disability and the uniqueness of students with disabilities, or whether low self-concept is consistently found across most poor readers. Researchers who have studied self-concept differences between students with RD and typically achieving peers (Heyman, 1990; Polychroni et al., 2006; Rothman & Cosden, 1995) have often implied that these differences are due to the former and not the latter.

This study examined differences between the vocabulary self-concept of adolescents with RD and poor readers who were not RD after instruction, as it would be expected that students with RD would on average have a lower self-concept than students
without RD. However, vocabulary self-concept between these two groups did not differ statistically. Both poor reader groups displayed an enhanced self-concept after instruction, suggesting the possibility that vocabulary instruction can benefit the self-concept of poor readers with and without disabilities.

**Limitations and Future Research**

Although students were nested in schools, an insufficient number of schools precluded analysis of data using multilevel models. Multilevel modeling might have provided better estimation of predictor variables by accounting for variance in self-concept that occurs between schools due to its ability to analyze self-concept both at the student and school level simultaneously. Thus, future research should employ designs with sufficient sample sizes to examine predictors of vocabulary self-concept using multilevel models.

In addition, the present study measured whether current vocabulary knowledge predicted current vocabulary self-concept. Further research could explore prior, current, and future pathways to explain the nature of the relationship between vocabulary knowledge and vocabulary self-concept bidirectionally.

**Implications**

Findings from this study have important implications for vocabulary instruction in content areas. First, as researchers venture to further understand the relationship between self-concept and achievement, more effort may need to be placed on targeting specific facets of reading self-concept. Prior research has focused on exploring the relationship between one’s reading achievement and reading self-concept. However, researchers have
demonstrated that one’s self-concept can vary depending on the specific area and domain (Marsh & Craven, 2006). In keeping with this rationale, rather than assessing reading as a whole, this study examined one component of reading that these students experienced difficulty with, vocabulary. Further research could explore reading self-concept by delving further into components of reading that contribute to reading difficulties.

Second, it is postulated that providing history instruction that includes systematic vocabulary development can assist in improving the vocabulary self-concept of adolescent poor readers in a relatively short period of time. In the present study, on average, adolescents who received the 3-week vocabulary intervention had a more positive self-concept than students who received the typical BAU history instruction. As Marsh and Craven (2006) stated, improving skills alone may be insufficient, as adolescents need to also hold positive self-concepts of their abilities in specific areas. Therefore, it is recommended that efforts be made by educators to enhance the self-concept of adolescent poor readers when working to improve content learning that may be affected by specific components of reading, such as vocabulary. In addition, this study showed explicit and direct vocabulary instruction that includes association building and provides multiple exposures to words throughout lessons is an effective way to improve vocabulary self-concept of poor adolescent readers. Thus, vocabulary instruction in history might include these aspects if educators seek to also improve self-concept.

Lastly, providing instruction that improves self-concept of middle school poor readers is critical prior to entrance into high school when self-concept stabilizes (Chapman, 1988). As self-concept has been found to relate to self-efficacy and how
adolescents feel about their academic skills (Bong & Clark, 1999), systematically targeting an academic skill such as vocabulary may lead to improved confidence and a sense of self-worth as they enter high school (Muijs, 1997), a critical time in life where adolescents who have a low self-concept tend to have high levels of anxiety and depression (Fathi-Ashtiani et al., 2007; Rosenberg, Schooler, & Schoenbach, 1989), and are at higher risk of failing content areas (Fathi-Ashtiani et al., 2007) such as history.
References


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<tr>
<th></th>
<th>District A</th>
<th>District B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment (N)</td>
<td>1077</td>
<td>921</td>
</tr>
<tr>
<td></td>
<td>1022</td>
<td>1000</td>
</tr>
<tr>
<td>Ethnicity n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>16 (1.5%)</td>
<td>13 (1.4%)</td>
</tr>
<tr>
<td></td>
<td>74 (7.24%)</td>
<td>61 (6.1%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>924 (85.8%)</td>
<td>869 (94.4%)</td>
</tr>
<tr>
<td></td>
<td>358 (35.0%)</td>
<td>644 (6.4%)</td>
</tr>
<tr>
<td>White</td>
<td>99 (9.2%)</td>
<td>24 (2.6%)</td>
</tr>
<tr>
<td></td>
<td>432 (42.3%)</td>
<td>259 (2.6%)</td>
</tr>
<tr>
<td>American Indian</td>
<td>2 (0.19%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td></td>
<td>5 (4.9%)</td>
<td>5 (0.5%)</td>
</tr>
<tr>
<td>Asian</td>
<td>17 (1.5%)</td>
<td>6 (0.7%)</td>
</tr>
<tr>
<td></td>
<td>54 (5.3%)</td>
<td>20 (2.0%)</td>
</tr>
<tr>
<td>Filipino</td>
<td>6 (0.56%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td></td>
<td>31 (0.3%)</td>
<td>10 (1%)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>4 (0.37%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td></td>
<td>6 (0.6%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td>Multiple/no response</td>
<td>9 (0.84%)</td>
<td>4 (0.4%)</td>
</tr>
<tr>
<td></td>
<td>41 (4.0%)</td>
<td>21 (2.1%)</td>
</tr>
<tr>
<td>English Language Learners</td>
<td>484 (44.9%)</td>
<td>576 (62.5%)</td>
</tr>
<tr>
<td></td>
<td>42 (4%)</td>
<td>101 (9.9%)</td>
</tr>
<tr>
<td>Special Education (by District)</td>
<td>9.8%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

Note. *Schools A and Y are intervention schools. Schools B and Z are business as usual (BAU).*
Table 2.  
*Sample Demographics by School*

<table>
<thead>
<tr>
<th>School</th>
<th>N</th>
<th>English Learners (ELs)</th>
<th>English Only</th>
<th>Reading Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>31</td>
<td>17</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>School B</td>
<td>27</td>
<td>11</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>School Z</td>
<td>17</td>
<td>2</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>School Y</td>
<td>31</td>
<td>1</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>31</td>
<td>74</td>
<td>34</td>
</tr>
</tbody>
</table>

*Note.* Schools A and B in District A. Schools Z and Y in District B.
Table 3.

*WASI Scores*

<table>
<thead>
<tr>
<th>Measures</th>
<th>All Students</th>
<th>RD</th>
<th>Non-RD</th>
<th>EL</th>
<th>EO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>34.07</td>
<td>11.85</td>
<td>31.76</td>
<td>10.96</td>
<td>35.68</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>42.2</td>
<td>9.67</td>
<td>41.62</td>
<td>9.5</td>
<td>42.60</td>
</tr>
<tr>
<td>Total IQ</td>
<td>82.10</td>
<td>12.51</td>
<td>79.48</td>
<td>11.82</td>
<td>83.93</td>
</tr>
</tbody>
</table>

*Note.* Mean and standard deviations of WASI scores. N=102.
Table 4.

**Self-Rating by School and Instruction Condition**

<table>
<thead>
<tr>
<th></th>
<th>Vocabulary</th>
<th>BAU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>School A</td>
<td>School Y</td>
<td>School B</td>
</tr>
<tr>
<td>Pretest</td>
<td>21.71</td>
<td>24.55</td>
<td>22.38</td>
</tr>
<tr>
<td>Posttest</td>
<td>29.44</td>
<td>30.03</td>
<td>24.19</td>
</tr>
</tbody>
</table>

*Note.* Mean self-rating reported. Schools A and B were from District A. Schools Y and Z were from District B.
Table 5.

Descriptive Statistics at Pretest

<table>
<thead>
<tr>
<th>Student Characteristics</th>
<th>Vocab Knowledge</th>
<th>Self-Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td><strong>RD Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>0.74</td>
<td>1.34</td>
</tr>
<tr>
<td>Non-RD</td>
<td>1.82</td>
<td>2.07</td>
</tr>
<tr>
<td><strong>EL Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EL</td>
<td>1.28</td>
<td>1.76</td>
</tr>
<tr>
<td>EO</td>
<td>1.46</td>
<td>1.99</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.37</td>
<td>1.88</td>
</tr>
</tbody>
</table>

*Note.* Self-Rating = vocabulary self-rating.
Table 6.

*Unadjusted Correlations of Variables used in Regression*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Self-Rating</th>
<th>Vocab Knowledge</th>
<th>RD Status</th>
<th>EL Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Rating</td>
<td>1</td>
<td>.264*</td>
<td>-.202*</td>
<td>-.166*</td>
</tr>
<tr>
<td>Vocab Knowledge</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>-.318**</td>
<td>-.059</td>
<td></td>
</tr>
<tr>
<td>RD Status</td>
<td></td>
<td></td>
<td></td>
<td>-.063</td>
</tr>
<tr>
<td>EL Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Vocab Knowledge = the log of vocabulary knowledge, 1 Tailed correlations, *= significant at the 0.05, ** = significant at the 0.01.
<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>0.00</td>
<td>.096</td>
<td>.000</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Vocab Knowledge</td>
<td>.264</td>
<td>.096</td>
<td>.264</td>
<td>2.738</td>
<td>.007</td>
</tr>
<tr>
<td>2 (Constant)</td>
<td>.281</td>
<td>.162</td>
<td></td>
<td>1.738</td>
<td>.085</td>
</tr>
<tr>
<td>Vocab Knowledge</td>
<td>.208</td>
<td>.101</td>
<td>.208</td>
<td>2.063</td>
<td>.042</td>
</tr>
<tr>
<td>RD Status</td>
<td>-.295</td>
<td>.204</td>
<td>-.146</td>
<td>-1.447</td>
<td>.151</td>
</tr>
<tr>
<td>EL Status</td>
<td>-.325</td>
<td>.191</td>
<td>-.163</td>
<td>-1.706</td>
<td>.091</td>
</tr>
</tbody>
</table>

Note. *Vocab Knowledge* = log of *Vocabulary Knowledge*. *Standard scores used for continuous variables.*
Table 8.

**Descriptive Statistics for ANCOVA**

<table>
<thead>
<tr>
<th></th>
<th>Mdn</th>
<th>Min</th>
<th>Max</th>
<th>IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocab</td>
<td>BAU</td>
<td>All</td>
<td>Vocab</td>
</tr>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>20.00</td>
<td>23.00</td>
<td>21.50</td>
<td>12.00</td>
</tr>
<tr>
<td>non-RD</td>
<td>24.00</td>
<td>22.50</td>
<td>23.50</td>
<td>17.00</td>
</tr>
<tr>
<td>All</td>
<td>23.00</td>
<td>23.00</td>
<td>23.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>28.50</td>
<td>25.00</td>
<td>27.00</td>
<td>18.00</td>
</tr>
<tr>
<td>non-RD</td>
<td>31.00</td>
<td>25.50</td>
<td>28.00</td>
<td>19.00</td>
</tr>
<tr>
<td>All</td>
<td>31.00</td>
<td>25.00</td>
<td>28.00</td>
<td>18.00</td>
</tr>
</tbody>
</table>

*Note.* Values report student self-rating. Mdn=Median, Min= Minimum, Max= Maximum, IQR= Interquartile Range, Vocab = Vocabulary, BAU=Business as Usual, RD= Reading Disability, All = entire sample.
Table 9.

*ANCOVA Results*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>(\eta^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>47.699</td>
<td>4</td>
<td>11.925</td>
<td>22.284</td>
<td>.000</td>
<td>.487</td>
</tr>
<tr>
<td>Intercept</td>
<td>.002</td>
<td>1</td>
<td>.002</td>
<td>.004</td>
<td>.953</td>
<td>.000</td>
</tr>
<tr>
<td>Pretest Self-Rating</td>
<td>21.466</td>
<td>1</td>
<td>21.466</td>
<td>40.115</td>
<td>.000</td>
<td>.299</td>
</tr>
<tr>
<td>Instruction</td>
<td>24.016</td>
<td>1</td>
<td>24.016</td>
<td>44.880</td>
<td>.000</td>
<td>.323</td>
</tr>
<tr>
<td>RD Status</td>
<td>.099</td>
<td>1</td>
<td>.099</td>
<td>.184</td>
<td>.669</td>
<td>.002</td>
</tr>
<tr>
<td>Instruction * Status</td>
<td>.162</td>
<td>1</td>
<td>.162</td>
<td>.303</td>
<td>.583</td>
<td>.003</td>
</tr>
<tr>
<td>Error</td>
<td>50.301</td>
<td>94</td>
<td>.535</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>98.000</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>98.000</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Dependent Variable= Self Rating at posttest, \(R^2 = .487\) (Adjusted \(R^2 = \).465), p-value is significant at \(p< .05\).
Table 10.
*Descriptive Statistics for ANCOVA*

<table>
<thead>
<tr>
<th>Vocabulary Self-Rating</th>
<th>Pretest Rating</th>
<th>Posttest Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAU</td>
<td>22.71</td>
<td>5.38</td>
</tr>
<tr>
<td>Vocab</td>
<td>23.04</td>
<td>5.71</td>
</tr>
<tr>
<td>RD Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>21.55*</td>
<td>5.66</td>
</tr>
<tr>
<td>Non-RD</td>
<td>23.80*</td>
<td>5.27</td>
</tr>
<tr>
<td>Total</td>
<td>22.87</td>
<td>5.52</td>
</tr>
</tbody>
</table>

Note. *= p < .05, **= p < .01, ***= p < .001.
Figure 1. *Self-perception Concept Map*

Note. Academic self-perception is an aspect of academic self-concept. Adolescents with low or less accurate self-concepts tend to also have less academic competence, high chances of burnout and dropout, high levels of anxiety and depression, less academic motivation, and lower metacognitive abilities.
Figure 2. *Boxplots of Vocabulary Self-Ratings at Pretest Disaggregated by Instruction and RD Status*
Figure 3. Boxplots of Vocabulary Self-Rating at Posttest Disaggregated by Intervention and RD Status