PREDICTIVE FACTORS OF LITERACY ACHIEVEMENT IN YOUNG GIFTED CHILDREN IN RURAL SCHOOLS

A Dissertation

Presented to

The Graduate Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

---

by

Maria El-Abd, M.A.T.

December 2017

Dedicated to

my mom, my dad, and my brothers,

and in loving memory

of my grandparents, who taught me the value of education

and showed me the joy of hard work

toward something you love.

ACKNOWLEDGEMENTS

It is rare—if not impossible—that we find ourselves at the end of our formal education without a sizable list of individuals without whom such a moment would certainly have been impossible. My acknowledgments are no different and begin, undoubtedly, with my parents. To my mother: thank you, thank you, thank you for never allowing me to give up when it felt like the easiest option. Throughout my confusions and doubts, you knew that I could make it, even when—especially when—I was quite certain I couldn't. Thank you for being my role model of what a good educator should be and for reminding me that nothing good comes without a good amount of hard work. To my father, thank you for teaching me the value of curiosity. Your seemingly endless questioning of the world around you has inspired me to always seek more knowledge, and thank you for always supporting the decisions I have made, as blind and wandering as they must have often seemed. To my brothers: thank you for being the constant source of laughter in my life. Thank you, Yasser, for being the image of high achievement that has constantly motivated me (probably since birth, and I still haven't caught up) and thank you, Samer, for being my reason for wanting to always push myself further so I can hopefully set some form of a decent example (which, as it turns out, you have already far exceeded).

To Caroyln, I could not possibly have had a better mentor. You have—in perfect measure—challenged me in the constant pursuit of becoming a better scholar and identifying what it is, precisely, that I wish to do with my life, and I am grateful for every opportunity you have given me in this endeavor. I can't remember the last time I was so thoroughly challenged, which is, perhaps, why I have grown as much as I have over the course of the past four years. Thank you for providing the perfect place in which this could happen and for guiding me, along the way, to finally seeing myself as a researcher.

To Carol, thank you for constantly bringing to life the joy of teaching. It might not always be an easy profession, but it is an immensely enjoyable one, so thank you for reminding me of that every time I was in your class. To Peter, thank you for telling me, in my very first year at UVA, that I had what it took to earn a Ph.D. You may not have known it at the time, but that message came at a point when I had the greatest doubts, so thank you for motivating me. And to Vivian, thank you for your patience in constantly responding to my endless stream of statistics questions; I could not have completed this project without your feedback and guidance. To Annalissa and the members of Project PLACE: no amount of thanks would suffice for all of the work you put into collecting and organizing the data, as well as answering my frequent—and frantic—e-mails, but thank you nonetheless.

As an educator, I could not possibly write my acknowledgements without thanking every single teacher or administrator that has taught or guided me, in one discipline or another, since I first entered school. From my elementary school principal, Mr. Blakely, and teachers, Ms. Sellers and Mrs. Parsons, to my high school teachers, Dr. Jones, Mr. Howard, Mrs. Mayhew, and Mrs. Armstrong, and to my professors at Sweet Briar College—Dr. Alouf, Dr. Gould, Carrie and JGB, John, Bessie and Dr. Kirkwood, Professor Wassell, and Professor Robeva, to name a few: thank you for helping me fall in love with learning. It is, quite possibly, the best gift anyone could ever ask for, so infinite thanks for your generosity in giving this to me.

To Fatma, Asma, Ekram, Nadia, Samia, Esraa, and Ladan: thank you for being my second family. This adventure wouldn't have been quite as enjoyable without you all sharing in it along the way. I look forward to what our next chapters will bring. To Hannah: I could not imagine a better or more amazingly talented friend with whom to walk across the stage in May.

Finally, to all of my students—past, present, and future—thank you for being the reason I continue to push myself further as I aim to become a better teacher, a better researcher, and a better person. You teach me endlessly more than I have ever taught you, and if I can ever repay that debt, I hope I have made—or will make—you fall in love with learning, too.

TABLE OF CONTENTS

ABSTRACT

The purpose of the present study was to investigate predictive factors of literacy achievement in third-grade students identified as gifted in rural schools. The sample consisted of 180 identified students in a total of eight districts, three of which were randomly assigned to the treatment condition and five of which were randomly assigned to the control condition. Students in the treatment condition received instruction with a place-based folklore unit of the CLEAR Curriculum, a language-arts based curriculum designed to challenge gifted learners, in addition to an intervention promoting a growth mindset. Results of the present study indicated that prior achievement, mindset, and gender were all statistically ($p < .05$) and practically significant predictors of literacy achievement for students identified as gifted in rural areas. A stronger growth mindset was associated with lower literacy achievement scores. Practical implications and recommendations, as well as limitations and directions for further research, were discussed.

Chapter I

INTRODUCTION

Contrary to the notion that giftedness is the manifestation of a stable trait (Mudrak, 2011), giftedness has more recently been presented as a developmental process (Hernández Finch, Speirs Neumeister, Burney, & Cook, 2014; Subotnik, Olszewski-Kubilius, & Worrell, 2011). In this conception, giftedness begins with potential, which transforms with time into accomplishments (Bailey et al., 2012; Hernández Finch et al., 2014; Siegle, 2015). Viewing giftedness as a process, exposure to certain individual-level or environmental-level factors may therefore help students identified as gifted grow in their capacity. However, for some identified gifted students, their potential for such achievements does not get realized. Some researchers estimate that anywhere between five and fifty percent of identified gifted children never realize their full intellectual or creative potential (Morisano & Shore, 2010).

For identified gifted students who do not fulfill their potential, the label of *gifted students* often morphs into one of *gifted underachievers*, reflecting the discrepancy between their expected and actual performance (Abu-Hamour & Al-Hmouz, 2013; McCoach & Siegle, 2003). Viewed as a waste of human potential (Abu-Hamour & Al-Hmouz, 2013), underachievement is a significant problem gifted children face (van der Meulen et al., 2014). Despite the fact that identified gifted students can underachieve and still meet the standards set for their grade level, underachievement can turn into a pattern that may be difficult to break, leading underachievers to be more likely to drop out of high school (Ritchotte, Rubenstein, & Murry, 2016).

Concerns about gifted underachievement may be particularly salient in rural areas where limited opportunities, coupled with a lack of student motivation and curriculum relevance, may serve as an obstacle to identified gifted students fully developing their potential (Budge, 2006).

One approach to remedying this situation is embodied in the movement toward place-based education, in which the curriculum used incorporates elements of place and, consequently, a sense of personal relevance (Smith, 2002). In this way, the curriculum, along with numerous additional factors, may provide an avenue to help identified gifted students in rural areas develop their potential and avoid underachievement.

Purpose of Study

To help promote the achievement of young identified gifted students in rural schools, it will be useful to explore the role of various factors noted in the literature as significantly predicting such achievement. Furthermore, few studies have specifically considered identified gifted students living in impoverished rural regions (Burney & Cross, 2006). Therefore, to fill this gap in the literature, the purpose in this study is to better understand predictors of achievement for students identified as gifted in rural schools.

Applying a multidimensional conception of giftedness, potential for achievement relies on cognitive abilities, but also on non-cognitive traits, such as personality and environment (Lüftenegger et al., 2015; Meier, Vogl, & Preckel, 2014; Stoeger, Steinbach, Obergriesser, & Matthes, 2014; Vlahovic-Stetic, Vidovic, & Arambasic, 1999). These cognitive and non-cognitive traits may be further divided into individual-level factors, consisting of traits such as motivation and self-efficacy, as well as environmental-level factors, consisting of school environment and life events (Stoeger et al., 2014). Therefore, attention will be paid to both internal and external factors in an effort to attain a more comprehensive understanding of the myriad of factors that contribute to achievement in identified gifted students in rural areas. In doing so, this study will help satisfy the need to learn how students in this unique population develop their talent (Burney & Cross, 2006).

Definition of Terms

For the purpose of the study, *gifted* is defined in accordance with the federal definition of giftedness:

> Students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities. (U.S. Department of Education, 2004)

The term *self-efficacy* refers to individual beliefs about one's own ability to succeed on tasks in a certain domain or to perform a particular activity (Rastegar, Jahromi, Haghighi, & Akbari, 2010; Siegle & McCoach, 2007). Therefore, *writing self-efficacy* refers to a "student's belief that he or she is capable of successfully completing an academic writing task" (Webb, Vandiver, & Jeung, 2016). According to Dai, Moon, and Feldhusen (1998), self-efficacy contributes to one's *self-concept,* or the collective self-perceptions held by an individual.

The term *mindset* is used to refer to an individual's personal theory of intelligence, or "implicit conception about the nature of ability" (Dweck & Leggett, 1988, p. 262). An individual's mindset can be viewed as a type of attribution style, or how they attribute success and failure (Dai et al., 1998).

Finally, the phrase *stereotype threat* refers to "apprehensions people feel when performing in a domain in which their group is stereotyped to lack ability" (Aronson & Inzlicht, 2004, p. 830).

Chapter II

REVIEW OF RELEVANT LITERATURE

The following review of the literature focuses on factors associated with achievement in identified gifted students. The review will comprise two parts, with the first focusing on individual-level factors and the second exploring environmental-level factors.

Individual-Level Factors Associated with Identified Gifted Student Achievement

An investigation of the literature on influential individual factors that are associated with achievement of gifted potential yields the following six factors: motivation (Lüftenegger et al., 2015; McCoach & Siegle, 2003; Meier et al., 2014), self-efficacy (Bandura, 1977; Martin & Marsh, 2006), mindset (Lin-Siegler, Dweck, & Cohen, 2016; King, 2012), stereotype threat (Ambady, Shih, Kim, & Pittinsky, 2001; Clark, Eno, & Guadagno, 2011; Steele & Aronson, 1995), gender (Dai, 2002; Dai et al., 1998; Li & Adamson, 1995), and race (Ford, Harris III, Tyson, & Trotman, 2002).

Motivation

Perhaps the most frequently cited factor in the literature linked to the development of gifted potential is the student's own motivation to achieve (Abu-Hamour & Al-Hmouz, 2013; McCoach & Siegle, 2003; Ritchotte, Suhr, Alfurayh, & Graefe, 2016; Wellisch & Brown, 2013). Notable researchers have continually referenced motivation as a key element of giftedness (Csikszentmihalyi, Rathunde, & Whalen, 1997; Gagné, 2000; Sternberg, 2001). While the environment surrounding a student can help in the recognition and development of giftedness, a student's motivation can help initiate and sustain such talent development (Abu-Hamour & Al-Hmouz, 2013; Gagné, 1995). Highlighting the importance of motivation to giftedness, Renzulli (2012) included it as a factor in his three-ring conception of giftedness, using task commitment

to represent a more refined form of motivation (Atalay & Kahveci, 2015). After a certain level of ability, task commitment becomes increasingly important for real-world achievements because, rather than remaining stable, it continues to be influenced by the environment and time (Renzulli, 2012).

Motivation and general achievement. For identified gifted students with different levels of achievement, motivation is a significant distinguishing factor, with higher motivation associated with greater academic achievement (Abu-Hamour & Al-Hmouz, 2013) and lower levels of motivation associated with underachievement (McCoach & Siegle, 2003). Students who are more motivated are more likely to seek challenging tasks and persevere in the face of difficulties (Lin-Siegler, Dweck, & Cohen, 2016), contributing to their overall achievement. In addition to attaining statistical significance, differences between gifted achievers and gifted underachievers on measures of motivation have also reflected large effect sizes (McCoach & Siegle, 2003). In fact, using solely motivation and goal valuation allowed for McCoach and Siegle (2003) to accurately predict the status of 81.8% of their sample of gifted students as either achieving or underachieving.

Given that a significant amount of time is often required to attain high levels of achievement in various domains (Hatano & Oura, 2003), motivation and perseverance can help identified gifted students work hard, practice, and dedicate the required amount of time in order to reach such achievements (Coleman, Micko, & Cross, 2015). Finally, the role of motivation may be especially important for gifted minority students as it may help them persevere against stereotypes and demonstrate high achievement in school (Coleman et al., 2015).

Intrinsic and extrinsic motivation. Motivation may be considered more specifically in terms of both intrinsic and extrinsic motivation (Dai et al., 1998). Intrinsic motivation can be

defined as learning for its own sake or for personal satisfaction (Phillips & Lindsay, 2006). It is similar to the construct of *achievement motivation* or the "need and drive for success" (Fletcher & Speirs Neumeister, 2012, p. 668), as well as the construct of *need for cognition* or "a tendency to engage in and enjoy effortful cognitive endeavors" (Meier et al., 2014, p. 39). Students are driven by intrinsic motivation when the task on which they are working captures their curiosity, sense of challenge, or enjoyment (Fletcher & Speirs Neumeister, 2012). For students who were similar in terms of cognitive ability, academic achievement, academic self-concept, and interest, need for cognition could help significantly predict who attended gifted classes and who didn't (Meier et al., 2014), further underscoring the importance of increasing intrinsic motivation in identified gifted students to allow for greater achievement (Dai et al., 1998; Fletcher & Speirs Neumeister, 2012).

On the other hand, extrinsic motivation, defined as being driven by rewards or threats of punishment (Phillips & Lindsay, 2006), has less favorable associations with gifted achievement. External motivation is associated with lower school engagement for high ability students, leading to the recommendation for educators to focus more on building intrinsic motivation rather than focus on extrinsic rewards (Fletcher & Speirs Neumeister, 2012; Kim, 2008).

Although intrinsic motivation alone may sufficiently predict achievement in domains such as math, both intrinsic and extrinsic motivation may help contribute to the success of identified gifted secondary students (Abu-Hamour & Al-Hmouz, 2013; Phillips & Lindsay, 2006). Indeed, intrinsic and extrinsic motivation are not necessarily mutually exclusive. Instead, the external environment surrounding an individual may help support the development of intrinsic motivation through the provision of appropriate opportunities (Coleman et al., 2015).

Risk factors for low motivation. Students with a lower degree of self-regulation, or

regulation of thoughts and actions toward a particular goal, may be at greater risk for lower academic motivation (McCoach & Siegle, 2003). Similarly, students' achievement values, or perception of task enjoyment or importance, may mediate the effects of their academic self-regulation, thus potentially impacting their motivation: if they do not believe the task to be important or valuable to their own lives, they may be more likely to exert less effort on the task (McCoach & Siegle, 2003).

Self-Efficacy

According to Bandura (1977), individuals process feedback from events and patterns experienced over a period of time, making note of which actions are required for certain outcomes to be observed. In this way, consequences influence thoughts, which influence behavior. This cycle prompts individuals to become motivated to exhibit certain behaviors based on their representation of possible future outcomes. However, in order for individuals to attempt behaviors associated with desirable outcomes, they must have a sufficiently high efficacy expectation, or belief that they are capable of successfully executing the behavior. Therefore, in the absence of high self-efficacy beliefs, individuals may avoid situations that exceed what they believe they can handle. The greater one's sense of self-efficacy, the more effort will be exerted in persisting in the face of difficulties and the more motivated the individual will be (Bandura, 1977; Pajares, Johnson, & Usher, 2007). It is worth noting, however, that self-efficacy is best studied with regards to specific tasks or domains (Phan, 2012). Therefore, an individual may have high self-efficacy in math—or even in certain topics in math—but not in English. In both situations, however, self-efficacy beliefs may either increase or reduce one's willingness to attempt certain tasks.

Sources of self-efficacy. According to the concept of self-efficacy first introduced by

Bandura in 1977, there are four primary sources of self-efficacy: mastery experiences, vicarious experiences, social persuasions, and emotional arousal (Bandura, 1977; Pajares et al., 2007). Mastery experiences refer to one's perception of prior performances; the more success one has experienced on a certain task or in a certain domain, the higher the expectation of mastery (Bandura, 1977; Pajares et al., 2007). It is important, however, that the individual believes past success on the task was a result of his or her own effort, not luck or external circumstances, and that the task itself was difficult; succeeding on an easy task is unlikely to significantly affect one's self-efficacy (Bandura, 1977). Vicarious experiences refer to the observation of others performing the task; such experiences tend to influence students more when they have limited or no familiarity with the task (Pajares et al., 2007). Social persuasions refer to verbal judgments received from others regarding a specific task, and emotional arousal refers to emotions, such as anxiety or stress, that may also influence one's sense of self-efficacy (Bandura, 1977; Pajares et al., 2007). Although these are the four primary sources of self-efficacy, goal setting may also contribute to students' sense of self-efficacy by providing them targets against which they may clearly measure their progress (Martin & Marsh, 2006; Siegle & McCoach, 2007).

The four primary sources of self-efficacy were first introduced by Bandura (1977) in his original conception of the construct, but there are inconsistent results in previous research as to the relative importance of each source, likely attributable to the context-specific and sensitive nature of self-efficacy (Pajares et al., 2007). However, mastery experiences seem to be one of the most influential sources (Pajares et al., 2007; Phan, 2012), particularly for identified gifted students (Webb et al., 2016). For instance, in a study of students ranging from elementary to high school, Pajares et al. (2007) found, among the four sources, mastery experiences accounted for the greatest amount of variance in writing self-efficacy and this result was consistent across

genders and grades. Furthermore, for elementary school students, mastery experiences and emotional arousal were the only significant predictors of self-efficacy. This is consistent with the results found by Phan (2012), in which mastery experiences were associated with an increase in English self-efficacy for elementary school students. However, students of different races may be differentially influenced by the various sources of self-efficacy (Stevens, Olivarez Jr., Lan, & Tallent-Runnels, 2004).

Self-efficacy and achievement. Regardless the source of one's sense of self-efficacy, numerous studies have pointed to the accuracy of self-efficacy as a predictor of performance, motivation, and academic resilience (Bandura, 1977; Martin & Marsh, 2006; Siegle & McCoach, 2007; Stevens et al., 2004). The relationship between self-efficacy and achievement has been established in math (Rastegar et al., 2010; Stevens et al., 2004) and in English, specifically with regard to writing and even after controlling for previous writing achievement (Pajares et al., 2007; Webb et al., 2016). The absence of high self-efficacy in a particular field may lead students to engage in fewer tasks in that domain and may consequently contribute to underachievement in identified gifted students (Ritchotte, Matthews, & Flowers, 2014; Webb et al., 2016). However, it is important to note that self-efficacy is not always stable and has been shown to fluctuate unpredictably over time, indicating that numerous factors, such as processes or contexts at the time of measurement, may influence self-efficacy (Phan, 2012).

Variations in self-efficacy. Although self-efficacy may change unpredictably with time, results of previous studies have indicated certain patterns of change in self-efficacy relative to students' age, gender, and status as identified gifted students. For instance, with regards to age, younger students tend to have higher self-efficacy than older students (Pajares et al., 2007; Webb et al., 2016). With regards to gender, self-efficacy must be considered relative to each domain.

The general belief is that girls have stronger self-efficacy in writing and language arts and boys tend to have higher self-efficacy in math and science (Pajares et al., 2007; Siegle & McCoach, 2007; Webb et al., 2016). However, in their studies, Siegle and McCoach (2007) and Webb et al. (2016) found gender didn't significantly predict self-efficacy in math and no gender differences were identified relative to writing self-efficacy. Finally, identified gifted students have generally reported higher levels of self-efficacy when compared to their non-identified peers (Hong & Aqui, 2004; Webb et al., 2016).

Mindset

The implicit theory of intelligence originally introduced by Dweck and Leggett (1988) was derived from the relationship between two constructs: achievement goals and mindsets. The term "achievement goals" refers to "standards of competence against which one's products or progress can be evaluated" (Dweck & Elliott, 1983, p. 646). The adoption of a particular mindset is associated with the pursuit of a particular type of goal (Dweck & Leggett, 1988). These two components are described below by drawing primarily from the seminal piece by Dweck and Leggett (1988), which has been revisited in further detail on numerous occasions over the years (e.g., Dweck, 2000, 2003).

Achievement goals. Dweck and Leggett (1988) first noted the existence of two types of achievement goals: learning goals and performance goals. Orientation toward a certain type of goal helps determine why students approach or engage with certain tasks (Bråten & Strømsø, 2004). Some students are more oriented toward learning goals, where the primary purpose is to increase competence; they are more likely to enjoy challenges, react effectively when faced with difficult tasks, remain committed to achieving their goals, and believe effort and ability are positively related (Dweck & Leggett, 1988). As a result, students who pursue learning goals are

more likely to exert more effort (Ablard, 2002). Other students are more oriented toward performance goals, where the primary purpose is to demonstrate competence (Dweck & Leggett, 1988). Such students might be more likely to believe failure implies inadequate ability and effort and ability are inversely related (Dweck & Leggett, 1988). Students who pursue learning goals are therefore more likely to avoid challenges and when they are not successful, they may respond in a maladaptive manner (Ablard, 2002; Dweck & Leggett, 1988).

In the classroom, the praise students receive may influence their alignment with certain achievement goals. For example, praising fifth grade students for intelligence influenced their preference for performance goals while praising them for hard work and effort led them to pursue learning goals (Mueller & Dweck, 1998). Although performance goals tend to be associated with maladaptive behaviors in response to failure (Mueller & Dweck, 1998), it is worth noting that the benefits of performance goal orientations have also been debated in the past (Ablard, 2002; Bråten & Strømsø, 2004).

Mindset and learning goals. Because of the importance of achievement goal orientation to student behavior, it is important to understand what leads students to orienting themselves to certain achievement goals (Bråten & Strømsø, 2004). According to Dweck (2000), mindset is seen as an antecedent of a student's achievement goal orientation (Bråten & Strømsø, 2004). In Dweck and Leggett's (1988) implicit theory of intelligence, mindsets come in two forms: incremental and entity. Students with an incremental mindset believe that everyone can become smarter by working to improve his or her intellectual potential (Dweck, 2003). Students with an incremental mindset are likely to blame a lack of effort for failure and, consequently, tend to pursue learning goals because they believe intelligence is malleable and can be increased (Dweck, 2003; Dweck & Leggett, 1988). However, students with an entity mindset believe that

intelligence is fixed and use their performance to gauge their level of intelligence, thus making them more likely to pursue performance goals (Dweck, 2003; Dweck & Leggett, 1988). For instance, college students who believed learning either happens quickly and easily or doesn't happen at all were less likely to adopt learning goals because exerting effort might be perceived as an inability to learn (Bråten & Strømsø, 2004). Students with a fixed mindset might blame their own lack of ability for their failure, which can lead to maladaptive consequences, such as refusing to attempt a task if it is too challenging (Dweck, 2003). Bearing in mind the significance of learning goals in the pursuit of academic opportunities, theories of intelligence may be critical in the development of adaptive and maladaptive behaviors regarding learning (Dweck & Leggett, 1988). Although mindset is often presented as a dichotomy between entity and incremental, such beliefs may exist on a continuum instead (Ablard & Mills, 1995).

Mindset and achievement. If students believe they are capable of improving their abilities, they may be more likely to benefit from class instruction and resources (Lin-Siegler, Dweck, & Cohen, 2016). Some studies have demonstrated incremental mindsets are positively correlated with academic success, at least for secondary students (e.g., King, 2012). Further signaling the academic benefits of incremental mindsets and learning goals, students in the fourth and fifth grades who were more oriented toward performance goals were more likely to exhibit helpless behaviors in the classroom (Erdley, Cain, Loomis, Dumas-Hines, & Dweck, 1997). Although mindset is often posited as a precursor to achievement, the nature of the relationship between mindset and achievement may be bidirectional, as evidenced in the study by Park, Gunderson, Tsukayama, Levine, and Beilock (2016) regarding math achievement of second-grade students.

According to Park et al. (2016), mindset has been linked to achievement in older

populations but the connection has not been as consistent with early elementary school samples. However, because early achievement can predict future achievement (Duncan et al., 2007), it is important to continue to study mindset in younger populations (Park et al., 2016). One challenge to such an endeavor, however, is that work in elementary school may not be challenging enough for identified gifted students to elicit an observable impact of mindset on achievement and approaches to tasks (Park et al., 2016). Furthermore, it will be important to consider when fixed beliefs about intelligence might be useful and aid in motivation (Callahan, 2012).

Effort and motivation. In addition to its potentially direct correlation with achievement, mindset may also influence achievement by affecting one's level of motivation. Because incremental theorists believe intelligence can be improved through effort (Dweck, 2003), they are more likely to place a greater emphasis on effort than are entity theorists when faced with failure or challenging tasks (Ablard, 2002; Ablard & Mills, 1995; Dai, 2000; Hong, Chiu, Dweck, Lin, & Wan, 1999). Furthermore, mindset influences one's attribution of success and failure, thus affecting motivation and, consequently, performance (Lin-Siegler, Ahn, Chen, Fang, & Luna-Lucero, 2016). More specifically, students with an entity mindset who believe they can't change their outcomes no matter how hard they try are less likely to remain motivated to achieve academically (Lin-Siegler, Ahn, et al., 2016).

Mindset and self-efficacy. Just as one's mindset may be related to one's motivation, it may also be related to one's sense of self-efficacy. For instance, students with an incremental theory are likely to pursue learning goals, regardless of their self-efficacy levels (Dweck, 1986). However, achievement goal orientation is more likely to differ for students with an entity theory depending on their levels of self-efficacy. Specifically, if an entity theory is paired with low self-efficacy, a student is more likely to develop helpless patterns of behavior and avoid challenges to

avoid appearing incompetent (Dweck, 1986; Makel, Snyder, Thomas, Malone, & Putallaz, 2015). However, if an entity theory is paired with high self-efficacy, the student is more likely to continue to seek challenges and remain persistent (Dweck, 1986). It is therefore important to consider mindset and self-efficacy simultaneously when attempting to predict achievement.

Mindset in identified gifted students. Although numerous studies have been conducted regarding mindset in the general population of students, it is also important to consider mindset as it relates specifically to identified gifted students. Further research in this field would contribute to an understanding of how to fulfill the potential of students who are underrepresented in gifted programs (Callahan, 2012) and it would help in understanding and predicting achievement in students identified as gifted (Ablard & Mills, 1995; Dai et al., 1998).

Some researchers (Ablard, 2002; Dai & Feldhusen, 1996; Feldhusen & Dai, 1997; Guskin, Okolo, Zimmerman, & Peng, 1986; Kerr, Colangelo, & Gaeth, 1988) have indicated identified gifted students may possess incremental mindsets, while others (Mudrak, 2011; Snyder, Barger, Wormington, Schwartz-Bloom, & Linnenbrink-Garcia, 2013) have conducted research that indicates the opposite may be true. The discrepancies evident in past studies regarding the mindset of gifted students may be explained as a byproduct of how mindset is measured. Measuring mindset on a continuum rather than as a dichotomy, Ablard and Mills (1995) noted the relatively normal distribution of mindsets held by students identified as gifted, with roughly half of the sample expressing borderline—neither fully entity nor incremental—views. Although this supports the relative diversity of mindsets seemingly held by identified gifted students, a limitation of their study was their use of a one-question assessment with no reliability or validity data, so their results should be interpreted with caution.

Achievement goals of identified gifted students. Although some identified gifted

students are eager to work on a challenge, others prefer to avoid it (Ablard, 2002). Therefore, as with mindsets of gifted students, the achievement goals they hold also tend to be diverse, indicative of the heterogeneity of this population of students (Dai, 2000). In her study, Ablard (2002) found students involved in a talent search program tended to endorse learning goals. However, the students comprising the sample were not necessarily identified as gifted, limiting the generalizability of her results.

Gifted label. A unique factor experienced by identified gifted students that may influence their mindset is their experience with the gifted label. Students who have been identified as gifted are likely to have salient perceptions regarding their own intelligence and abilities (Ablard & Mills, 1995). For instance, identified gifted students in previous studies have been shown to react more negatively to failure than their non-identified peers, despite taking similar courses and attaining similar levels of achievement (Roberts & Lovett, 1994). Students' maladaptive responses to failure in gifted programs may be a consequence of their perceptions that the gifted label is associated with higher expectations (Hertzog, 2003). This may lead students to become too concerned with proving that they deserve the label and, as a result, place less emphasis on challenging themselves to develop their potential (Mueller & Dweck, 1998).

However, the results in the literature remain inconclusive as to whether giftedness is perceived by students as a fixed or malleable trait (Makel et al., 2015). Furthermore, perceptions of giftedness and perceptions of intelligence have been shown to be different, even within the same individual, with students generally viewing giftedness as more fixed than intelligence (Makel et al., 2015), implying the perception that one's degree of giftedness is less likely to change than is one's intelligence. Such results are indicative of the great diversity in implicit beliefs about intelligence and giftedness (Makel et al., 2015).

Mindset interventions. Despite the inconsistencies regarding mindsets held by identified gifted students, interventions promoting a growth mindset have shown positive results (e.g., Blackwell, Trzesniewski, & Dweck, 2007). By influencing students' mindsets, one can also affect students' goal orientations (Dweck, 2000), potentially guiding them to pursue goals more conducive to learning. Such interventions have taken a variety of forms, from reading about struggles of famous individuals (Dweck & Leggett, 1988; Hong & Lin-Siegler, 2012; Lin-Siegler, Ahn, et al., 2016) to reading articles supporting an incremental mindset (Ehrlinger, Mitchum, & Dweck, 2016; Schroder, Moran, Donnellan, & Moser, 2014). Because mindsets are implicit constructs, they can generally be redirected with simple interventions (Schroder et al., 2014), thus helping influence a reduction in negative beliefs about ability and improving student motivation and performance in school (Lin-Siegler, Dweck, & Cohen, 2016). It is worth noting, however, that positive effects of interventions tend to be more observable for students at risk of low achievement or underachieving students than for their higher achieving peers (Schwartz, Cheng, Salehi, & Wieman, 2016; Wilson & Buttrick, 2016).

Stereotype Threat

In addition to motivation, self-efficacy, and mindset, stereotype threat is another individual-level factor associated with student achievement and performance (Ambady et al., 2001; Clark et al., 2011; Steele & Aronson, 1995). Increased stereotype threat is associated with holding an entity mindset (Callahan, 2012), pursuing performance goals (Aronson, Fried, & Good, 2002), maintaining a tenuous sense of self-efficacy (Aronson & Inzlicht, 2004), experiencing increased anxiety (Aronson & Steele, 2005; Steele & Aronson, 1995), and dis-identifying with or devaluing the domain (Aronson et al., 2002; Steele, 1997). Stereotypes regarding ability differences between genders or ethnicities may also contribute to gender and

ethnic differences in performance (Ambady et al., 2001; Aronson & Steele, 2005), serving as an obstacle for men in linguistic domains (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010) and for women in math (Steele, 1997).

Prerequisites and predictors of stereotype threat. In order for stereotype threat to be salient, several criteria must first be met. First, the individual must identify with the group with which he or she is associated; the more deeply individuals identify with their ethnic or gender group, the greater responsibility they feel for positively reflecting their group, and the more likely they are to experience the negative effects of stereotype threat (Alter et al., 2010; Aronson et al., 1999; Aronson & Steele, 2005; Steele, 1997). Additionally, the stronger an individual's entity mindset, the more likely he or she is to agree with social stereotypes (Levy, Stroessner, & Dweck, 1998). Stereotype threat also affects confident students more notably than it affects unconfident students (Steele, 1997). Finally, stereotype threat is most salient in environments that include the group being stereotyped along with a group that isn't (Steele, 1997).

Stereotype threat in young children. As early as first grade, students may be aware of stereotypes regarding math performance and gender (Lummis & Stevenson, 1990). As students become older and enter upper elementary school grades, concepts of masculinity and femininity, as well as race, begin to be incorporated into their identities (Ambady et al., 2001). Such concepts regarding gender begin to influence performance by the time students are in middle school (Hyde, Fennema, & Lamon, 1990). Even though gender differences emerge by the time students are in middle school, when asked about differences between boys and girls, students from kindergarten to grade eight tended to indicate they perform the same (Ambady et al., 2001). These results indicate that young students may not be consciously aware of existing stereotypes before entering high school, even though their own performance was influenced by activation of

such stereotypes. The notably limited diversity of the sample, however, restricts generalizability to a more ethnically diverse population of students.

Overcoming stereotype threat. Similar to how an incremental mindset may be promoted through an intervention, the negative effects of stereotype threat may also be overcome through minor interventions. When students in grades 4-6 were prompted to consider stereotype threats as a challenge, they performed better (Alter et al., 2010). Interventions to promote a growth mindset have also been shown to encourage the achievement of individuals in domains in which they are typically stereotyped for poor performance (Good, Aronson, & Inzlicht, 2003), highlighting the potential relationship between mindset and stereotype threat.

Gender

Achievement. Gender differences in math achievement have been well documented in the past (Benbow & Stanley, 1980), and although the gender achievement gap is shrinking when achievement is measured through classroom grades, the gender gap in math achievement persists on standardized tests (Schwery, Hulac, & Schweinle, 2016). Gender differences in English and language arts have also been documented, although they tend to favor girls (Brookings Institution, 2015). In addition to domain-specific gender gaps, distinctions between boys and girls also appear relative to motivation, self-efficacy, mindset, and stereotype threat.

Motivation. Many factors influence the gender gap in achievement, including self-esteem, self-perception of ability, attribution, and locus of control (Li & Adamson, 1995). For instance, girls' attributions of success and failure in math and science tend to decrease their motivation (Heller & Ziegler, 1996), which is then connected to their achievement (McCoach & Siegle, 2003). Therefore, it is important to consider gender differences not only in terms of quantitative comparisons of achievement, but also as qualitative indicators of patterns of

behaviors and developmental paths (Dai, 2002).

Self-efficacy. Self-efficacy can be affected by stereotypical gender roles and one's social environment and interactions (Dai, 2002; Kramer, 1991; Preckel, Goetz, Pekrun, & Kleine, 2008). Therefore, because self-efficacy is specific to a certain domain (Junge & Dretzke, 1995), boys tend to have higher levels of self-efficacy in math and science while girls tend to have higher self-efficacy levels in verbal domains (Dai, 2002; Junge & Dretzke, 1995; Olszewski-Kubilius & Turner, 2002; Preckel et al., 2008), and such confidence may predict future achievement (Freeman, 2003). It is worth noting, however, that previous performance doesn't consistently support students' stronger self-efficacy beliefs (Dai, 2002), indicating the source of their self-efficacy may instead be verbal persuasions, vicarious experiences, or emotional arousal (Bandura, 1977). Regardless of the source of their self-efficacy, gender differences in domain-specific self-efficacy are more pronounced and can be observed from a young age (Heller & Ziegler, 1996). With time, however, students' self-efficacy should become more accurate as they base their causal attributions on past performances (Junge & Dretzke, 1995).

Mindset. In addition to motivation and self-efficacy, gender holds potentially salient implications for student mindsets and achievement goal orientations. For instance, in their study, Bråten and Strømsø (2004) found gender was a significant predictor of all achievement goals, with females more likely to hold learning goals. However, Dai (2002) noted concerns that girls may react to failure in a maladaptive fashion and that social pressures and expectations may influence their desire to succeed. Findings by Heller and Ziegler (1996) with a sample of female university students support this concern, with participants more likely to attribute failure to their own ability rather than effort.

Stereotype threat. Although performance differences based on gender seem to be

diminishing with time, boys still maintain an advantage in math (Schwery et al., 2016), and such gender differences in achievement may be explained by stereotype threat (Dai, 2002). Notably, girls may be at risk of experiencing greater social-evaluative pressure than their male counterparts (Dai, 2002; Heller & Ziegler, 1996). As a result, girls are more likely to underestimate their own ability in domains such as math and science (Heller & Ziegler, 1996), even though researchers generally agree there are no differences between girls' and boys' innate ability to do math (Olszewski-Kubilius & Lee, 2011). Because the fear of failure may be more relevant than the fear of success (Dai, 2002), such underestimations stemming from stereotype threat may contribute to the gender gap in achievement.

Gender differences and identified gifted students. In addition to gender differences that exist between males and females in the general population, differences in gender gaps have also been observed between gifted and non-identified students, as well as between identified gifted males and females.

Comparing identified gifted and non-identified students. Numerous researchers have pointed to the more significant gender gap that tends to emerge toward the upper extremes of performance (Benbow & Stanley, 1980; Cramer & Oshima, 1992; Freeman, 2003; Olszewski-Kubilius & Turner, 2002). Furthermore, despite the diminishing gender gap in the general population, performance distinctions between the genders have persisted among the identified gifted population (Olszewski-Kubilius & Turner, 2002; Preckel et al., 2008). Although a more recent study found that gender differences were not more exaggerated at the upper end of the score distribution (Olszewski-Kubilius & Lee, 2011), concern for the existence of gender differences on above-level testing are particularly significant because such testing is often used for identification purposes for gifted programs (Olszewski-Kubilius & Turner, 2002).

Gender gaps among identified gifted students. Among identified gifted students, gender gaps have been noted with regards to several measures. For instance, gifted males have reported higher levels of self-efficacy than gifted females (Junge & Dretzke, 1995). This is consistent with the observation by Preckel et al. (2008) that although the achievement of gifted females has increased over time, they still hold lower academic self-perceptions than do gifted males. For instance, in terms of mindset, girls believed boys had more natural ability while girls had to put forth more effort, which was seen as an indicator of lacking intelligence (Kramer, 1991). Even when they did succeed, gifted girls tended to devalue their ability and attribute their success to effort instead (Kramer, 1991), which Li and Adamson (1995) found to be true of their response to failure, as well.

Gender gaps among identified gifted students tend to be studied in two domains: math and English. Although all identified gifted students generally performed better on math and science than on verbal subtests of the SAT, gifted males were more likely to have higher scores on the math subtest while gifted girls were more likely to have higher scores on the verbal subtest (Olszewski-Kubilius & Lee, 2011). Such distinctions in performance (e.g., Olszewski-Kubilius & Lee, 2011) may begin as early as grade three, with male gifted students outperforming their female counterparts in math (Olszewski-Kubilius & Turner, 2002). Identified gifted students also appear to be aware of their respective domain of strength: gifted boys identified their strengths as math and science while gifted girls noted theirs to be in verbal areas (Olszewski-Kubilius & Turner, 2002). Awareness of their respective strengths may contribute to the tendency of gifted males to show a stronger orientation to performance goals in math than do their female counterparts (Preckel et al., 2008) and to gifted girls' greater confidence in English than gifted boys' confidence (Dai et al., 1998). Furthermore, these gender

differences in performance have remained relatively stable over time (Olszewski-Kubilius & Lee, 2011). It is not surprising, therefore, that males are overrepresented in the mathematically gifted population and are more likely to enter math-intensive fields (Freeman, 2003; Preckel et al., 2008).

Reconciling the gifted identity. One potential cause for gender gaps in achievement among identified gifted students stems from conflicts between traditional notions of femininity and academic achievement (Freeman, 2003). Because giftedness may lead to high expectations, girls' gifted identity can work against them if they desire a sense of belonging and if they place a greater emphasis on pleasing their parents and meeting their perceived expectations (Kramer, 1991). The struggle between gender identity and giftedness seems unique to gifted females; although gifted boys were aware of the confusing expectations associated with being gifted, they were less likely to be concerned about them (Kramer, 1991).

Race

The final individual-level factor associated with achievement is race. African American students, along with Hispanic students identified as gifted, perform at lower levels than their Caucasian and Asian American counterparts at all levels of socio-economic status (Olszewski-Kubilius & Lee, 2011). In fact, Olszewski-Kubilius and Lee (2011) found that the majority of African American and Hispanic gifted students had SAT math subtest scores in the lowest two score ranges. According to Plucker, Burroughs, and Song (2010), these excellence gaps, or "differences between subgroups of students performing at the highest levels of achievement" (p. 9), should not be overlooked. Therefore, provided there is sufficient diversity of race in the present sample, it will be important to consider this factor when predicting achievement of identified gifted students.

Environmental-Level Factors Associated with Identified Gifted Student Achievement

In addition to the individual-level factors explored above, numerous environmental-level factors have also been noted in association with student achievement. For the purposes of this study, I will focus specifically on curriculum and geographic rurality.

Curriculum

Although various studies have focused on the effects of various grouping arrangements on the achievement of identified gifted students (e.g., Delcourt, Cornell, & Goldberg, 2007; Kim, 2016; van der Meulen et al., 2014; VanTassel-Baska, Zuo, Avery, & Little, 2002), it is important to also study the effects of the curriculum on gifted student achievement because of its salient influence on the development of gifted potential (Altintas & Ozdemir, 2015; Callahan, Moon, Oh, Azano, & Hailey, 2015; Gallagher, 2015; Jarvis, 2009).

Challenge. Challenge is important to intellectual growth (Callahan, 2012), but concerns have recently been expressed that the unique needs of identified gifted students are not being met in the classroom due to a lack of challenge (Bailey et al., 2012; Callahan et al., 2015). Although students identified as gifted have a certain amount of potential, if they are not challenged in the classroom, their potential may atrophy (Altintas & Ozdemir, 2015). For example, without the opportunity to engage in tasks within their zone of proximal development, identified gifted learners may lose confidence in their ability to succeed on such tasks when presented (van der Meulen et al., 2014), possibly leading them to adopt an entity view of intelligence (Ablard & Mills, 1995). Therefore, curriculum that is aligned with identified gifted students' levels of achievement and current skills and their learning characteristics may help them better fulfill their potential and advance their achievements (Atalay & Kahveci, 2015; Kanli & Emir, 2013).

If the main goal of education is to release the "human agentic power" (Dai, 2012, p. 49)

of each individual, then an appropriate environment and curriculum in which challenge is well-integrated is especially important (Dai, 2012; Gallagher, 2015). According to Jarvis (2009), such a curriculum, replete with "engaging, culturally relevant, appropriately challenging learning opportunities" (p. 234), can help potential emerge into talent. In the absence of such challenges in the curriculum, the consequence for identified gifted students may be underachievement (Reis & Morales-Taylor, 2010; Ritchotte, Rubenstein, & Murry, 2016). Similarly, a curriculum that is too challenging—particularly for identified gifted students who may not have strong study skills due to prior and continuous exposure to relatively easy curriculum—may lead to frustration, a reduced sense of self-efficacy, and, consequently, underachievement (Ritchotte, Rubenstein, & Murry, 2016). An appropriate curriculum is important not only so identified gifted students do not get bored (Siegle, 2015), but also so they develop and maintain a strong sense of self-efficacy, motivation, and sustained growth as learners (VanTassel-Baska et al., 2002).

CLEAR curriculum. One example of a model for curriculum designed to challenge identified gifted learners is the CLEAR curriculum model, based on five foundational elements: continual formative assessment, clear learning goals, data-driven learning experiences, authentic products, and rich curriculum (Callahan et al., 2015). The curriculum model incorporates elements from three primary sources. The first is Tomlinson's (2001) philosophy of differentiation, which contributed a focus on big ideas and an emphasis on matching the degree of challenge to the individual students. From Renzulli and Reis's (1985) Schoolwide Enrichment Model, the CLEAR curriculum model adopted engagement through learning process skills and conducting in-depth investigations. Finally, from Kaplan's (2005) Depth and Complexity model, the CLEAR curriculum model borrowed elements of depth through patterns and big ideas, as well as elements of complexity through interdisciplinary connections and various perspectives.

All three of these models have been associated with greater achievement, although not all of the studies conducted on their effectiveness involved a randomized control group design (Callahan et al., 2015).

The CLEAR curriculum model has served as the basis for the creation of two units at each of the following grades: third, fourth, and fifth. Because identified gifted learners spend a significant amount of time in classrooms being exposed to what they already know, the units are designed to increase challenge by increasing the depth and complexity of the concepts presented, incorporating more abstract content, relying on more open-ended problem-solving, and using more higher-level critical thinking skills (Callahan et al., 2015). The curriculum was also designed to allow students to work with more independence and with more options, as well as with an accelerated instructional pace. The learning goals are aligned with national standards and embody skills essential to the domain. Furthermore, the curriculum incorporates a high degree of challenge through the use of advanced vocabulary used in the discipline, interdisciplinary and intradisciplinary connections, and identification of patterns, rules, perspectives, and questions within a unit (Callahan et al., 2015).

For the purposes of this study, I will focus on one of the third grades units, namely, the folklore unit. The CLEAR curriculum units are each designed to be completed in a semester if using a typical pullout arrangement, but could also be done on a daily basis in self-contained classes (Callahan et al., 2015). The goal of the folklore unit is to encourage students to explore folklore as a process of storytelling and communicating norms and culture, as well as expand skills in reading comprehension and writing. Students learn about motifs, stereotypes, and the universality of people and places. For their final project, they plan and implement a Folklore Festival in which they each embody a profession deriving from an interest in folklore.

Throughout the unit, learning is also assessed through formative assessments. In a three year-long randomized control study, Callahan et al. (2015) found the CLEAR curriculum units could help improve student learning and achievement and that implementation fidelity was significantly associated with student learning.

Fidelity. When assessing curriculum implementation, fidelity is an important but challenging aspect to consider (Callahan et al., 2015). Fidelity of implementation can moderate the effects of an intervention on an outcome of interest, but there is currently no standard method to assess fidelity (Moon & Park, 2016). Because identified gifted students experience interventions and instruction in a variety of grouping arrangements and under a variety of time constraints, intervention implementation exists on a continuum and fidelity will rarely be perfect (Moon & Park, 2016). Using the data collected on the units developed based on the CLEAR curriculum Callahan et al. (2015), Moon and Park (2016) found 75% of lessons were implemented with fidelity in the first cohort of participants, compared to 65% in the second cohort. Modifications were more likely to be negative than positive, and this pattern was more likely to hold true for pull-out classroom teachers than for teachers in self-contained classrooms. Time constraints were the most frequently cited cause for modifications, followed by student ability, which was cited significantly less frequently. Therefore, in studying factors in understanding how a specific curriculum predicts achievement, it will be important to consider the degree to which the curriculum was implemented with fidelity.

Geographic Rurality

Current status of rural education. The final factor that will be considered as a predictor of achievement in identified gifted students is geographic rurality. Nearly ten percent of students at public schools attend schools in rural areas where the high school dropout rate averages 11%,

but the dropout rate can be as high as 40% in the more remote regions (Burney & Cross, 2006; Hardre & Reeve, 2003; Provasnik et al., 2007). This pattern extends into college, with college enrollment rates lower in rural areas than in all others (Provasnik et al., 2007). Poverty further complicates the problems faced by rural schools (Hébert & Beardsley, 2001). Approximately 35% of children living in rural areas live in poverty (Provasnik et al., 2007) and this population includes some of the poorest students in America (Lockette, 2010). Rural poverty can be an obstacle to student achievement (Hardre & Reeve, 2003) and the issue is exacerbated by the fact that rural public schools tend to receive smaller percentages of revenue from federal sources than do city public schools (Provasnik et al., 2007). With more than half of the school districts and one-third of public schools nationwide residing in rural locations (Provasnik et al., 2007), addressing issues associated with rural education is an important undertaking.

Although it is difficult to define what rural is because of the diversity the term encompasses, rural places tend to be characterized by low population density, isolation, interdependence between the school and community, disagreement regarding the purpose of schooling, and an attachment to place (Budge, 2006; Burney & Cross, 2006). Rural economies tend to be weak in most of the nation, affected by geographic isolation, out-migration of human capital, and advances in technology (Budge, 2006). The consequent economic hardships can lead to social problems that can affect student achievement in these areas (Budge, 2006). In a case study of a rural community, Budge (2006) found students were apathetic, had limited goals, and didn't see how education was relevant to their lives. Furthermore, community leaders believed geographic isolation led to few quality or appropriately challenging experiences that would prepare students for lives after graduation, a concern that affects students' opportunities to develop their potential (Burney & Cross, 2006). In addition to a need for motivation, students in

rural areas experience an internal conflict between their connection to the community and the limited economic or educational opportunities available to them upon graduation, forcing many of them to leave (Budge, 2006).

Fortunately, what goes on in the classroom can help promote motivation in rural students (Hardre & Reeve, 2003). For instance, teachers can support student interests in school, which may lead to motivation and, as a result, persistence toward graduation (Hardre & Reeve, 2003). Increasing student autonomy, self-determined motivation, perceived competence, and self-efficacy may all contribute to greater student achievement in rural areas (Hardre & Reeve, 2003).

Sense of place. A unique aspect of rural communities is the powerful sense of place that is critical to citizens' identity development and quality of life (Budge, 2006). Therefore, separating education from sense of place can have a negative effect on students (Budge, 2006). Unfortunately, formal education has been associated with losing one's connection to the community in rural areas (Corbett, 2009), perhaps attributable to the lack of relevance in the curriculum to the students' own lives. Consequently, researchers have encouraged the incorporation of students' actual concerns in the curriculum used in schools (Lockette, 2010). One way in which this might be done is for teachers to encourage students to begin considering what it means to be living in a rural area (Lockette, 2010). In such a movement toward place-based education, the goal becomes to "ground learning in local phenomena and students' lived experience" (Smith, 2002, p. 586). By making knowledge more personally relevant, it becomes more valuable to students and can validate their own experiences and culture (Smith, 2002). As a result, students may become more engaged in school and experience greater achievements if there is less of a division between what students are learning in school and what they experience outside of school (Smith, 2002). A place-based education, by appealing to a sense of relevance,

may benefit identified gifted students in rural areas and help them feel more confident about staying in their community and helping it (Dai et al., 1998; Smith, 2002).

Identified gifted students in rural America. Although identified gifted students in rural areas are less likely to feel stigmatized for being gifted, they are also less likely to have academic peers (Burney & Cross, 2006; Cross & Burney, 2005). Therefore, identified gifted students in rural areas are likely to feel like a big fish in a small pond (Hébert & Beardsley, 2001). The lack of appropriate opportunities for identified gifted students in rural schools may also be a risk factor for achievement (Cross & Burney, 2005). Specifically, if rural students identified as gifted aren't exposed to challenges in their youth, they may resent advanced courses and challenges when they are older, which may then impact their potential for success in college (Burney & Cross, 2006; Cross & Burney, 2005). Therefore, such students need to develop positive self-efficacy, self-esteem, and self-concept (Burney & Cross, 2006). Given their unique situation and needs, it is important to conduct studies aimed at better understanding how educators can support the achievement of identified gifted students in rural areas.

Chapter III

METHODS

Research Question

The factors explored in the review of the literature have been associated with achievement in identified gifted students. However, few of them have been studied specifically among the population of identified gifted students in rural areas. Given the unique situation of students in rural areas, it will be important to study which factors significantly predict rural gifted student achievement in order to better understand how to help promote the factors that are associated with their success. Therefore, I will seek to address the following research question:

1. To what extent do the following factors predict literacy achievement of third-grade identified gifted students in rural areas: prior achievement, motivation, self-efficacy, mindset, stereotype threat, gender, race, and exposure to a unit based on the CLEAR curriculum model?

Data

Given the concerns about gifted underachievement in rural areas, where students are faced with limited opportunities and a lack of motivation and curriculum relevance (Budge, 2006), it is important to investigate the factors noted in the literature that might contribute to gifted student achievement in rural areas. Therefore, the primary research question in the present study is: to what extent do prior achievement, motivation, self-efficacy, mindset, stereotype threat, gender, and exposure to a unit based on the CLEAR curriculum model predict literacy achievement of third-grade identified gifted students in rural areas? The limited racial diversity of the sample precludes the inclusion of race as a variable. In an effort to answer this research question, I will conduct a series of exploratory regression analyses with various predictive

models incorporating varied selections of the identified predictors.

Data for the present study were collected as part of an overarching and ongoing study, Project PLACE, a randomized control trial designed to investigate the effects of place-based curriculum on literacy achievement in rural identified gifted students. The present study is designed to extend the analysis of the Project PLACE by using the collected data to investigate whether there are important predictors for literacy achievement in identified gifted students, and whether these predictors are related to heterogeneous treatment effects in the overarching study, or whether there are variations in treatment effects based on differences in baseline measures.

Data for Project PLACE were collected by the principal investigators and a research team of graduate students, including myself. Therefore, while the data analysis will be unique to the present study and independently conducted, the data collection was conducted by the research team. Therefore, the term "we" will be used when appropriate to represent the larger team effort involved in certain components of the methodology.

Identification of Districts

For the present study, I chose to include only data collected during the first year of participation for districts that had been recruited for Cohort 2 in Project PLACE; I excluded Cohort 1 due to the revision of measures following the analyses conducted with data collected from those students. All participating districts were characterized by both rurality and poverty and were identified due to their designation by the state of Virginia as rural. According to the U.S. Department of Education Common Core of Data Public School Universe (U.S. Department of Education, 2012), there are three possible classifications for rural districts:

1. Rural, fringe: A Census-defined rural territory located no further than five miles from an urbanized area or no further than 2.5 miles from an urban cluster;

2. Rural, distant: A Census-defined rural territory located between five and 25 miles from an urbanized area or between 2.5 and ten miles from an urban cluster; and
3. Rural, remote: A Census-defined rural territory further than 25 miles from an urbanized area and more than ten miles from an urban cluster.

As of 2013, there were 81 rural school districts in Virginia (National Center for Education Statistics, n.d.). In addition to being a rural district, to be considered for participation, at least 50% of the student population in the districts had to qualify for Free and Reduced Lunch according to the Virginia Department of Education Office of School Nutrition Programs. Two districts agreed to participate in Cohort 1, with an additional eight joining for Cohort 2 the following year. Both districts in Cohort 1 maintained participation in Project PLACE for a second year, thereby each yielding a new group of students for Cohort 2, bringing the total number of districts in the present study to ten. All participating districts were randomly assigned to either treatment or control conditions. Therefore, Cohort 2 consisted of five treatment districts and five control districts.

Intervention

CLEAR curriculum. Students identified as gifted in the treatment districts of Cohort 2 received instruction based on the CLEAR Curriculum during their third grade year, in which they completed units of instruction in folklore and poetry. Each unit adheres to the five foundational elements of the CLEAR Curriculum: continual formative assessment, clear learning goals, data-driven learning experiences, authentic products, and rich curriculum. Given the timeline and focus of the present study, I focused solely on the folklore unit.

Folklore unit. The folklore unit of the CLEAR Curriculum consists of twenty lessons aligned with state third-grade reading and writing standards, as well as national standards set

forth by the National Council of Teachers of English (NCTE). The objective of the unit is to provide students an opportunity to explore folklore and folktales as vehicles for storytelling and communicating social norms and cultural morals. In the process, students also develop reading skills and strategies, learn about narrative elements, and write for a variety of purposes.

Specific topics in the folklore unit include: an introduction of the literary terms used regarding folktales (e.g., folk, fairytale, fable, variant, culture, motif, and stereotype), a comparison of different categories of folklore, an exploration of how stories change when they are recorded and how folktales help readers develop feelings of empathy. The results of formative assessments conducted throughout the unit are used for differentiating activities. The culminating project for the folklore unit is the Folklore Festival, in which each student assumes the role of a profession stemming from folklore (folklorist, storyteller, or literary teller) in a festival performed for an audience. The identification of students through aptitude as measured by the Cognitive Ability Test –Verbal Battery (CogAT-V) and student traits, such as creativity and motivation, was aligned with the goals of the folklore unit.

Place-based components. Throughout the CLEAR Curriculum, icons are used to draw teacher attention to certain aspects of each lesson. Some icons stem from the Depth and Complexity Model (Kaplan, 2013), but others have been developed specifically for the CLEAR Curriculum. An important addition to the content of the lessons and instructional strategies is represented by an icon created specifically for Project PLACE, the Place icon. The Place icon is inserted at those junctures in the unit where students are completing tasks related to their own lived experiences. The icon symbolizes opportunities for students to draw connections between the content covered in class and their own community. One example of the use of the Place icon is a prompt for students to consider the fairytale-like qualities of wooded areas near their own

homes. In another lesson, students reflect on code-switching, sometimes employed to cover one's own accent in favor of better fitting in with one's surroundings or to avoid judgment. The purpose of these reflections is to encourage students in rural areas to make connections between the content they are learning in school and the rural communities in which they live. Additional details regarding the lessons in the unit, as well as information about the place-based elements in the lessons, can be found in Appendix B.

Mindset intervention. In addition to receiving instruction with the CLEAR Curriculum, students in districts assigned to the treatment condition received messages aimed at promoting a growth mindset via two routes: specific references in the units themselves and a separate mindset intervention in the form of a WebQuest.

***Curriculum*.** Lessons 2 and 4 of the Folklore unit include messages promoting a growth mindset. In Lesson 2, students learn the purpose of a fable is to convey a moral. Students are then asked to consider how the oral tradition of storytelling led to individuals who heard the stories expanding their knowledge the more they heard stories being narrated. After considering how many stories exist in the world today, students are then prompted to consider how much they are capable of learning. They are guided to the conclusion that, due to the vast quantity of books and stories available for them to read, there is an endless amount of information they are able to learn, which supports the belief associated with a growth mindset that there is no limit to one's ability to learn and grow.

In Lesson 4, the teacher defines *stereotype* for students and indicates that characters in fairytales are often based on stereotypes. After learning about *stereotype* as a noun, students then learn about the term as a verb. The teacher explains to students the harmful effects of stereotyping others and, more specifically, the negative consequences of believing stereotypes

about others' intelligence (e.g., girls aren't as good in math as are boys) to be true. This leads to a reminder of each student's ability to go beyond stereotypes to excel in any area in which they exert effort. In this way, subtle messages promoting a growth mindset are linked to the folklore curriculum.

WebQuest. In addition to the messages within the lessons of the unit, we implemented a separate intervention to promote a growth mindset among students in the treatment group. We developed the growth mindset intervention by adapting the relevant components from the intervention used by Blackwell et al. (2007) to a younger age group. We created a WebQuest intervention, an inquiry-based lesson that prompts students to read, source, and connect information from the internet (Dodge, 2015). Small-group and whole-group activities involve reading, watching, and discussing age-appropriate online materials about how the brain works, the nature of intelligence, and how to overcome stereotype threat. The lessons include information about neurons, how the brain reacts to learning something new, and neuroplasticity and are designed to be completed by students in a single four- to five-hour session.

Data Collection

Eligible rural school districts for Cohort 2 were identified and invited to participate. Following recruitment, all second-grade students at all participating schools completed the Verbal Battery of the Cognitive Abilities Test (CogAT-V). Second-grade teachers attended teacher training sessions regarding the use of three subscales of the Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS) with specific attention to the ways those characteristics might manifest in rural identified gifted students. The teachers then completed the scales for each of their students. We entered this data into a spreadsheet and computed national and local norms for the CogAT-V scores and district and classroom norms for

the SRBCSS scales which was then shared in meetings with district personnel to identify an additional pool of identified gifted students in each participating district that had not been identified through the schools' identification procedures.

During the next fall, students identified as gifted by the school district and by the project specific identification process – and now in the third grade – at both treatment and control schools completed the pre-intervention measures: the language arts subtests of the Iowa Assessment (Reading, Written Expression, and Vocabulary), as well as the measures of self-efficacy, mindset, and stereotype threat. Identified gifted students at the treatment schools received the intervention, including the use of the folklore unit and the mindset intervention during the fall or spring semester. All identified gifted students at both treatment and control schools completed the end-of-unit folklore test in the following spring.

Measures

Identification Measures

Upon identifying the participating districts, second-grade students could be identified to receive gifted services through one of two routes: they could be identified by their respective school district or they could be identified by the research team of Project PLACE.

Identification of students by districts. Refer to Appendix B for a more comprehensive overview of the identification procedures implemented in each participating school district. Note that the descriptions in Appendix B were collected from local gifted plans and that, in practice, these plans may differ from the actual implemented identification procedures.

Identification of students by Project PLACE. The identification of second-grade students by the Project PLACE research team to receive gifted services was based on data from two assessment instruments: The Cognitive Abilities Test-Verbal Battery (CogAT-V; Lohman,

2012) and three subscales (motivation, creativity, and reading) of the Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS; Renzulli, Smith, White, Callahan, & Hartman, 1976).

CogAT-V. The first step in the identification of gifted students for participation in the study was the administration of CogAT-V Level 9 (Lohman, 2012). The CogAT-V Level 8 test designed for second-grade students incorporated questions regarding images and read-aloud passages. After conferring with David Lohman, the primary author of the CogAT assessments, we determined the Level 8 form would not allow us to assess students' reading and writing abilities to the extent that would be necessary for our purposes (personal communication, January 14, 2015). Therefore, we administered the Verbal Battery of Level 9 of the CogAT to avoid ceiling effects when testing and to capture students' writing and reading abilities, which we identified as relevant skills for the language arts curriculum that would be implemented with identified gifted students in the treatment districts. The Verbal Battery of Level 9 consists of three subsections: Verbal Analogies, in which students identify the missing part of the analogy based on the relationship between two items; Sentence Completion, in which students select the best word to complete a sentence; and Verbal Classification, in which students identify which object best belongs in the same category as the three objects presented to them in the stem.

Reliability and validity. To evaluate the reliability and validity of the CogAT, Lohman (2012) relied on a sample of students from both public and private schools from each region of the country. Public schools were selected using three stratifying variables: geographic region, district enrollment, and Title I status. Within each combination of these three variables, schools were randomly selected. Private Catholic schools were stratified into five categories based on the size of school's diocesan enrollment. Private non-Catholic schools were selected at random from

each of the four geographic regions.

Based on the sample of public and private schools, Lohman (2012) provided reliability and validity estimates for the various levels of the CogAT. The split-half reliability of the Level 9 Verbal Battery for third grades students is reported as .93 and the standard error of measurement is reported as 4.3 (CogAT scores range from 50 to 160), with greater score variability at either end of the score range. The validity evidence for the CogAT is based on claims (Lohman, 2012) that the tasks incorporated in the CogAT subtests are similar to those used on other well-established measures of reasoning abilities. Furthermore, an inspection of the subtest correlations shows the correlations are moderately strong among the Verbal Battery subtests, with correlational values ranging from .65 to .68 (N = 6,136). Concurrent validity evidence has also been established between the CogAT and the Woodcock-Johnson III (r = .68), as well as between the CogAT and the Wechsler Intelligence Scale for Children (r = .79).

Administration. We administered the CogAT-V according to the procedures outlined in the CogAT manual to all second-grade students in participating districts. To the maximum extent possible, we scheduled make-up testing days for students who were absent during the initial administration of the CogAT-V. Students completed the CogAT-V in a location that was agreed upon with each district's personnel. In most cases, students completed the CogAT-V in their own classrooms, but they were occasionally pulled together into larger groups to complete the test in the cafeteria or another location.

Scoring. To convert students' raw scores on the CogAT-V to age, grade, and local percentile ranks, we submitted student answer sheets from Cohort 1 to the testing company for scoring. However, for Cohort 2, we scored CogAT-V in accordance with the procedures outlined in the CogAT Norms and Score Conversions Guide. To automate the process in an effort to

reduce the possibility of human error in calculations, we created a template in Microsoft Excel. After entering the relevant conversion tables from the CogAT Norms and Score Conversions Guide, we then applied a series of formulas that would convert the student's raw scores to the corresponding values for the various percentile ranks.

To check our procedure for hand-scoring the CogAT-V, we compared the results of our procedure using Cohort 1 data to the results returned to us by the testing company. Values for grade percentile rank were identical because they relied on exact values. However, values for age and local percentile ranks relied on a table organized by student age in three-month increments. Because the testing company used an undisclosed table with one-month increments, results for age and local percentile ranks differed slightly between our hand-scoring and the testing company. However, such differences were negligible, reaching a maximum of six points for age percentile ranks and 9.8 percentile points for local percentile ranks. Furthermore, differences in local percentile rank values reached a maximum of 5.1 after the 75th percentile, which was the point at which we began considering students for identification. Because these differences did not affect the rank-order of students, we deemed such differences to be negligible for identification purposes.

Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS; Renzulli et al., 1976). The second component of identification involved collecting teacher ratings of student behavior using the SRBCSS, a set of teacher rating scales designed to measure behavioral indicators in students of various characteristics associated with giftedness. We used only three of the SRBCSS scales for identification: creativity, motivation, and reading. We selected these scales because we anticipated students with higher levels of motivation, creativity, and reading engagement would be more likely to benefit from the units in the CLEAR language

arts curriculum we would be implementing with identified gifted students. The creativity, motivation, and reading scales consist of nine, eleven, and six items, respectively. Each item represents a specific behavior or trait that a student might demonstrate (e.g., "The student demonstrates a sense of humor."). After participation in a staff development session which provided guidance in interpretation of the scales and specific orientation on how the characteristics might manifest in rural students, teachers were instructed to rate each student in their classes on each of the three scales by indicating, on a six-point continuum the frequency of occurrence of the trait (ranging from never to always).

Reliability and validity. Content validity of the original SRBCSS forms was established through a review of the research on characteristics associated with identified gifted students; to be considered for inclusion, each scale item had to be referenced in at least three separate studies (Renzulli et al., 1976). Teachers and counselors were also asked to provide, following field tests, feedback regarding the effectiveness and usability of the scales. Comparisons of SRBCSS results between identified gifted (N = 40) and non-identified (N = 40) fifth-grade students at the same school produced statistically significant differences on the Learning, Motivation, Creativity, and Leadership scales. To establish content validity of the revised scales, the developers relied on responses from 60 experts in gifted education regarding the connection between the conceptual and operational definitions of each of the items on the revised scales (Renzulli et al., 2010). The experts also indicated the category to which each item best belonged (Learning, Motivation, Creativity, and Leadership), as well as the strength, on a scale of one (low strength) to three (high strength), of the item-category match. To retain an item, at least 70% of the experts had to categorize the item correctly and the average strength rating had to be at least 1.75. Content validity of the more recently-introduced Reading subscale was established through a similar

procedure. After identifying a list of characteristics often associated with the domain, the scale developers distributed the items to a broad range of at least 25 experts in reading; items were retained if they received an average strength rating of at least two from at least 80% of the experts.

To assess the reliability of the four revised SRBCSS subscales, the developers conducted a field test, in which teachers rated a random selection of their students (N = 572, of which 309 were identified as gifted) using the revised SRBCSS subscales; the school districts were selected through convenience sampling and were located in various geographic regions in the United States (Renzulli et al., 2010). The alpha reliability coefficient was .84 for Creativity and .90 for Motivation, supporting the internal consistency of the revised instrument. Reliability for the Reading subscale was established through a random sample of 726 students in grades four through six attending public schools; it was estimated, based on this sample, to be .94 (Renzulli et al., 2010).

Teacher training. To prepare second-grade teachers to use the SRBCSS forms reliably, we developed materials to use in training sessions for all involved teachers at all participating school districts. As part of the training sessions, we introduced examples of how various characteristics represented in the scales may be exhibited, specifically in rural identified gifted students. We also encouraged teachers to share examples of creativity, motivation, and reading engagement they had observed in their own students. Following the training session, teachers completed the three SRBCSS subscales on paper forms for each of their students. Teachers who needed additional time to complete the subscales were instructed to mail their forms back to us in a pre-addressed envelope.

Scoring. Teachers' scores for each item were weighted by the indicated frequency and

summed for a total subscale value, with higher values indicating higher levels of the subscale trait. The research team then entered the indicated values for each student into a template in Microsoft Excel that was programmed to compute each subscale total for each student. SRBCSS classroom z-scores were calculated for all students for each subscale. A similar procedure was used for calculating the SRBCSS z-scores at the district level for each student on each subscale.

Identification meetings. Upon agreeing to participate in the study, each school district had been instructed to implement their typical gifted identification practices according to their normal timeline. In administering the CogAT-V and SRBCSS, the purpose was not to replace the districts' identification practices, but rather to identify additional students to receive gifted services who may have otherwise been overlooked in the districts' standard identification procedures. Therefore, we held district identification meetings after district school personnel had already completed their own identification practices and compiled a list of students to receive gifted services based on their criteria. Additional information regarding the identification procedures implemented in each participating district can be found in Appendix B.

Identification meetings were typically attended by the district superintendent or the superintendent's designé, director of gifted services, PLACE project director, and PLACE project staff, although the superintendent and gifted director could invite additional staff at their discretion. To prepare for the identification meetings, project staff compiled the data from the student-completed CogAT-V and teacher-completed SRBCSS subscales into an Excel file for each district. We created these district profiles by entering information for each participating student in the district for the following categories: student name; raw score, classroom z-score, and district z-score for each subscale of the SRBCSS; and CogAT-V raw score, local age percentile rank, national grade percentile rank, and national age percentile rank. Student names

were highlighted in different colors to represent various combinations of score ranges on the CogAT-V (using a student's local age percentile rank) and the SRBCSS (using a student's district- or classroom-level z-score, whichever was greater). The categories were: (1) 90th percentile on CogAT-V score (national or district norms) and on SRBCSS ratings (on at least one subscale and relative to either classroom or district)[1], (2) 90th percentile on CogAT-V score only, (3) 90th percentile on CogAT-V score and 75th percentile on SRBCSS ratings, (4) 75th percentile on CogAT-V score and 90th percentile on SRBCSS ratings, (5) 90th percentile on SRBCSS ratings only, (6) 75th percentile on CogAT-V score and on SRBCSS ratings, (7) 75th percentile on CogAT-V scores only, and (8) 75th percentile on SRBCSS ratings only.

We brought these district profiles to the identification meetings to allow individuals from the research team and representatives from participating districts to meet and identify how many additional students the district personnel judged they could serve based on staff availability and numbers already identified in the district. A majority of the district personnel identified additional students who were characterized by either a high CogAT-V score (90th percentile or above) and moderate SRBCSS ratings (z-score of 1.0-1.49) or a moderate CogAT-V score (75-89th percentile) and high SRBCSS ratings (z-score of 1.5 or above), but a few selected students who were moderate in both CogAT-V and SRBCSS scores. Once identified, all students, whether identified by the district or as a result of our district identification meetings, received the same services. Descriptive statistics of the final sample can be found in Appendix C.

Pre-Intervention Measures

We administered standardized assessments of achievement and measures of self-efficacy,

[1] For all categorizations, the same comparisons were used; i.e., CogAT-V was compared to district or national norms and inclusion according to SRBCSS was based on either classroom or district norms on at least one subscale.

mindset, and stereotype threat in the fall of the identified students' third grade year[2]. Students in both treatment and control groups completed the pre-test measures. Teachers administered all the measures to their students during the same time frame or, when necessary due to scheduling constraints, as close in time to one another as possible. Although the Iowa Assessment is timed, the remaining pre-test measures are not, but they were designed to take no longer than approximately 30 minutes (total) to complete; this time was verified in field tests of the measures. All data collected via pencil-and-paper and were scored and entered into a Microsoft Excel spreadsheet by members of the Project PLACE research team.

Achievement. To measure student achievement at the beginning of the study, we administered Level 10 of the Iowa Assessments. We administered only the Reading, Written Expression, and Vocabulary sections due to our focus on literacy achievement. The Reading section consists of 42 items, Written Expression consists of 38, and Vocabulary consists of 34 (Iowa Testing Programs, 2013). In the Reading section, students respond to questions based on identifying, analyzing, and interpreting information in both literary and informational passages. In the Written Expression section, students respond to questions focused on effective ways of expressing ideas and identifying errors in text. Students also respond to questions incorporating various elements of writing such as organization, clarity, sentence structure, and effective or inappropriate language. In the Vocabulary section, students answer questions regarding specific vocabulary words used in a sentence or short phrase, identify synonyms for given words, and demonstrate knowledge regarding nouns, verbs, and modifiers.

Reliability and validity. Content validity of the Iowa Assessments was established through an extensive review process of items guided by state, professional, and international

[2] These instruments are also to be used for post-assessment at the conclusion of the intervention in Project PLACE.

standards, as well as frameworks and test specifications by the National Assessment of Educational Progress (NAEP), scholarly research, educator feedback, curriculum surveys, and assessment data (Dunbar & Welch, 2015). To further evaluate the validity and reliability of the Iowa Assessments, Dunbar and Welch relied on a national sample of students selected from public and private schools. The sample was selected to be representative of the national population in terms of ability and achievement, and consideration was also given to the diversity of the sample. Schools were selected based on district size, region, and socioeconomic characteristics, as indicated by Title I status and the percent of students eligible for free and reduced-price lunch. All grades in selected schools were included in the sample. Public schools were selected through stratified sampling on the basis of three variables: geographic region, district enrollment, and Title I status. Within each combination of these three variables, schools were selected at random and invited to participate. Private Catholic schools were stratified into five categories, based on diocesan enrollment and were then randomly selected in two stages from within each category. In the first stage, they selected dioceses at random from each of the five enrollment categories. In the second stage, schools were randomly selected from each of dioceses selected in the previous stage. Private non-Catholic schools were randomly sampled from within each of the four major geographic regions. The ethnic and racial diversity of the resulting sample of students closely resembled national distributions, with a maximum discrepancy of two percentage points.

Using the final sample of public and private schools, the test developers administered the appropriate level of the Iowa Assessment to each student in the Fall of 2010 (Dunbar & Welch, 2015). To assess the internal structure of the Iowa Assessments the developers conducted an exploratory factor analysis, which indicated three major constructs resembling the major

domains of the Common Core State Standards: literacy, mathematics, and written language mechanics. To evaluate predictive validity, the developers calculated correlations between the Iowa Assessments and ACT Composite scores; results ranged from .82 to .87, with higher correlations for the higher levels used (e.g., Grade 11 Iowa Assessment). Using the Kuder-Richardson 20 formula, the reliability coefficient of the Iowa Assessment Level 10 for fourth grade in the fall was estimated to be .90 for Reading, .90 for Written Expression, and .90 for Vocabulary. In the spring, these values were assessed to be .91 for all three subtests.

Scoring. Scores for achievement were calculated by determining the total number of questions answered correctly on each subtest of the Iowa Assessments, yielding a score for Reading, Written Expression, and Vocabulary. These were then summed to create a total achievement score for each participant.

Self-efficacy. The scale for measuring self-efficacy, "How I Feel About Reading and Writing" (HIFRW), was developed to gauge self-efficacy beliefs regarding language arts skills in third and fourth grade students. Although studies and measures of writing self-efficacy existed (Andrade, Wang, Du, & Akawi, 2009; Hidi, Berndorff, & Ainley, 2002; Pajares, 1996, 2003; Pajares, Miller, & Johnson, 1999; Shell, Colvin, & Bruning, 1995; Shell, Murphy, & Bruning, 1989), they did not incorporate all aspects of literacy that were relevant to the CLEAR Curriculum treatment. Furthermore, existing instruments were not cognitively appropriate for younger children. Therefore, we developed the HIFRW scale specifically to assess writing and reading self-efficacy in third and fourth grade students. We adapted items from the existing scales to reflect self-efficacy relating to skills that could be reasonably expected from third and fourth grade students, based on the Virginia Standards of Learning, the Common Core Curriculum for Language Arts, and big ideas from previous PLACE curricula.

We began by defining reading self-efficacy as student perceptions of the degree to which they had the skills required for reading comprehension. Writing self-efficacy referred to student self-perceptions of their skills in communicating information effectively in written form. Finally, we defined research self-efficacy as student perceptions of their skills in investigation and reporting from numerous sources on a specific topic.

Item creation. To create the items for the HIFRW scale, we began with a review of over 40 items, which included newly constructed items and revised items from pre-existing scales (Pajares et al., 1999). All items were written in affirmative "can do" language, in accordance with Bandura's (2006) recommendation. After eliminating items that were either redundant or not essential skills in language arts, as indicated by a language arts expert on our team, we retained 14 items. We also re-scaled the response categories to reflect four response options, which we determined in consultation with a measurement expert would be more appropriate for younger children than Bandura's (2006) recommended scale of 0 to 100. We provided detailed descriptions for each of the four options: "I definitely can't do it," "Maybe I can do it," "I'm pretty sure I can do it," and "I can definitely do it" (Bell, 2007).

Expert review and cognitive interviews. Experts in language arts with experience teaching third and fourth grade students and experts in gifted education with experience creating instruments for third and fourth grade identified gifted students reviewed the items for content and language structure and we revised them accordingly. Following the revisions, we conducted cognitive interviews with nine third grade students in a rural school district who were either identified as gifted or as advanced readers. For the cognitive interviews, we focused on the scale's overall structure, vocabulary used in the scale, ease of completion, the meaning the students attached to the items, and the instructions provided. Based on how students interpreted

the items, we revised the language of the items to improve clarity (Bell, 2007). Overall revisions resulted in a 15-item scale. Items represented behaviors indicative of reading and writing self-efficacy beliefs (e.g., "I can read smoothly and easily"), to which students responded by selecting one of the four available options.

Pilot studies. The self-efficacy scale underwent two pilot studies. For the first pilot study, we administered the 15-item scale to a sample of 47 third and fourth grade students attending an enrichment program, as well as identified gifted students attending a school district in southwestern Virginia. We found the overall alpha reliability estimate to be an acceptable .80. Additionally, we noted the reliability coefficient of internal consistency would increase to .81 by removing two of the items. We also examined the pattern of responses and found most students were selecting "sort of true" or "very true" for most statements. We conducted an independent t-test to investigate mean score differences between students in second and third grade and those in fourth and fifth grade on all items. We found a significant difference for only one of the items, which indicated that students were more likely to select "sort of true" or "very true" for most of the items, regardless of their grade level. We were therefore prompted to consider expanding the number of response options to increase variability in student responses. Finally, we assessed skewness and kurtosis values for each item to determine normality of each item's response distribution.

Based on the results of the aforementioned analyses, two items were excluded from the exploratory factor analysis conducted next. After conducting the EFA, an additional item was removed from the scale due to cross-loading. Therefore, following the first pilot investigation, the self-efficacy scale consisted of 12 items representing three factors: simple writing and reading task, complex writing and reading task, and research.

For the second pilot study, 191 students participating in a summer program for identified gifted students completed the newly revised 12-item scale. The new scale consisted of five response options: “I am sure I can’t do it,” “I don’t think I can do it,” “I think I might be able to do it,” “I am pretty sure I can do it,” and “I am definitely sure I can do it.” Reliability estimates for internal consistency of each of the three factors ranged from .68 to .78. Following an exploratory factor analysis, we found that the scree plot and eigenvalues did indicate three factors with acceptable factor loadings above .40. However, communality of item 11 was .36 and was therefore removed before re-conducting an exploratory factor analysis. Results of the second EFA still indicated three factors, although an examination of the factor loadings does not suggest a logical grouping across factors. The overall reliability estimate for internal consistency of the 11 items was .87. Based on the high overall internal consistency and the results of the EFA, we concluded that the HIFRW scale represented a single general scale of self-efficacy in reading and writing without any subscales.

Scoring. Scores for self-efficacy were calculated by assigning each response option a numerical value, ranging from 1 for “I am sure I can’t do it” to 5 for “I am definitely sure I can do it.” Responses were then averaged across the 11 items for each participant, creating an overall self-efficacy score for which higher values represented stronger self-efficacy beliefs relative to reading and writing.

Mindset. To measure implicit theories of intelligence, we used the Implicit Theories of Intelligence Scale (Dweck, 2000). Dweck (2000) has developed two different measures of implicit intelligence: a 6-item scale and an 8-item scale. Dweck (2000) recommended the 6-item scale for children who are ten years old or older, while the 8-item scale is recommended for use with adults. However, insufficient validity evidence exists for the use of 6-item scale with

children younger than ten years old. Furthermore, no researchers have provided validity and reliability evidence for scores from the 6-item scale for young identified gifted students. Therefore, we conducted a pilot study to compare psychometric properties of the 6-item scale with the 8-item scale when used to measure implicit theories of intelligence with identified gifted third and fourth grade students.

Cognitive interviews. We conducted cognitive interviews in January 2015 with nine third and fourth grade students. The purpose was to assess item readability and clarity of the 8-item Implicit Theories of Intelligence Scale (Dweck, 2000), in which the 6-item scale is embedded. Based on the results of the interview, we revised items as needed prior to conducting a pilot test of the scale, renamed "How Does Your Brain Work?" with two separate samples.

Pilot study. For the pilot study, we administered the revised 8-item scale to a sample of 43 students. The sample consisted of third and fourth grade students identified to receive gifted services in a public school program, as well as third and fourth grade students participating in a Saturday Enrichment Program (SEP). Students were considered to participate in SEP on the basis of teacher and parent ratings of the student using ten items derived from the SRBCSS (Renzulli, Hartman, & Callahan, 1971). One student did not complete the survey, leading to a total sample size of 42 students. Because of the small sample size, we ran a descriptive analysis and calculated internal consistency reliability estimates for two sub-factors. Reliability estimates for the two sub-factors were .75 and .84, which fall in an acceptable or good range (George & Mallery, 2003). Based on the Shapiro-Wilk test, most items were normally distributed with the exception of three items. Of these three items, we could remove two of them to result in the 6-item scale Dweck (2000) recommended for children aged ten and older. Therefore, we decided to use the 6-item scale to assess implicit theories of intelligence in our study. The reliability

estimates for the two sub-factors using the 6-item scale were .58 and .81.

Scoring. Scores for mindset were calculated by assigning each response option a numerical value, ranging from 1 for "Strongly Agree" to 5 for "Strongly Disagree." Responses to the items were then reverse-coded so that greater numerical values would be indicative of a stronger agreement with the statements. An entity mindset score was created by averaging the responses for the three entity mindset statements, while a similar process was used to create an incremental mindset score. An overall mindset score was produced by averaging the original entity mindset values with the recoded incremental mindset values so that lower values were more indicative of an entity mindset and higher values were more indicative of an incremental mindset.

Stereotype threat. The scale measuring stereotype threat, "Who I Am and How I Learn" (WIAHIL), was used to assess stereotype threat relative to gender, ethnicity, socioeconomic status, reading and writing, and living in a rural community. To create the scale, we began with an examination of the Social Identities and Attitudes Scale (SIAS; Picho & Brown, 2011), a scale designed to measure stereotype threat in adolescents. We selected and revised items from the gender, ethnicity, and stigma consciousness factors of the SIAS to make them more suitable for the reading and cognitive level of elementary school students. We also identified three additional factors due to our belief that they would be relevant for elementary school age students living in impoverished rural areas: reading/writing, rural settings, and low socioeconomic status. Using the format of the items on the SIAS, we created items for the newly identified factors. Experts in gifted education, elementary education, and literacy reviewed all items of the revised scale. As a result, we duplicated the scale to create two separate forms, one for girls and the other for boys, thus reducing the need for complex language in our stems. We

also reformatted the 7-point Likert scale to a 5-point Likert scale to account for our younger sample of students. The response options were “Strongly disagree,” “Disagree,” “Neither agree nor disagree,” “Agree,” and “Strongly agree.”

Cognitive interview. Following the revisions, we administered the WIAHIL scale to nine third and fourth grade students who were identified as gifted in their respective school districts. During administration, we conducted a cognitive interview with the students. Student feedback resulted in further revisions to improve clarity. As a result, the scale was modified to a 45-item scale.

Pilot studies. We conducted two pilot studies of the WIAHIL scale. The first consisted of students from two samples: third and fourth grade students who participated in a Saturday Enrichment Program, as well as identified gifted students in the third and fourth grades in a local school district. Due to a request of the school district, students from the second sample completed the scale without the items relating to ethnicity. Of the 101 participants across both samples, a total of 85 completed the scale. Internal consistency estimates for the proposed factors ranged from .53 to .89. We also conducted an exploratory factor analysis on five of the newly created factors (rural background identification, rural background stigma consciousness, low-SES identification, low-SES stigma consciousness, and reading/writing identification); we excluded those pertaining to ethnic identification and ethnic stigma consciousness from the analysis as we were not able to administer to those items to part of our sample. We also excluded items measuring gender identification and gender stigma consciousness because they were not newly created. The resulting scree plot and eigenvalues indicated seven factors with some items presumed to be associated with one factor loading on another (e.g., items from the Low-SES Stigma Consciousness factor and the Rural Background Stigma Consciousness factor loaded on

the same factor, while items measuring Reading/Writing identification loading on two separate factors). Because we had initially anticipated five factors, we conducted a varimax rotation with five fixed factors. All communalities fell above .40, indicating an acceptable range, with the exception of two items which we decided to remove from the scale. We also removed five items because they either cross-loaded on two factors or were redundant. An additional item was modified because it had also cross-loaded on two factors.

The resulting WIAHIL scale comprised 38 items with the following factors: Low-SES and Rural Background Stigma Consciousness, Reading Identification, Writing Identification, Rural Background Identification, Low-SES Identification, Gender Identification, Gender Stigma Consciousness, Ethnic Identification, and Ethnic Stigma Consciousness.

We conducted a second pilot study of the WIAHIL scale due to our small sample size for the first pilot study. Our sample consisted of 159 students attending a Summer Enrichment Program. We conducted an exploratory factor analysis to evaluate if the items on the scale reflected the nine factors identified at the end of the first pilot study. The scree plot and eigenvalues confirmed nine factors. One of the items was moved to a new factor based on its factor loading, while one was revised in hopes of making it more likely to clearly load on one of the factors. The final scale consisted of 38 items with the following nine factors: Gender Stigma Consciousness, Ethnic Identification, Ethnic Stigma Consciousness, Rural Identification, Low-SES Identification, Reading/Writing Identification, two Gender Identification factors, and Rural Background and Low-SES Stigma Consciousness. Reliability estimates for all factors ranged from .52 to .89.

Scoring. Results from the Social Identities and Attitudes Scale (Picho & Brown, 2011) are meant to be interpreted as unique factor scores, not an overall score (Smith & Cokley, 2016).

Therefore, results from the WIAHIL scale were similarly interpreted. Stereotype threat scores were calculated by first assigning each response option a numerical value, ranging from 1 for "Strongly disagree" to 5 for "Strongly agree." Averages were then created from the items that comprise each of the nine factors, yielding a total of nine scores representative of varying forms of stereotype threat vulnerability (e.g., gender identification or ethnic stigma consciousness).

Because stereotype threat is most likely to be felt in environments that include the group being stereotyped along with a group that isn't (Steele, 1997), I hypothesized that stereotype threat vulnerability with regard to rural identity would be less significant when all students in the sample attended a rural school. Additionally, given the gender gap in reading achievement (Brookings Institution, 2015), I hypothesized that stereotype threat with regard to gender would be a relevant consideration given the exposure to the folklore unit and the presence of both genders in any given school. Therefore, for the present study, I chose to focus specifically on stereotype threat with regard to gender. To create a numerical indicator for stereotype threat vulnerability with regard to gender, I averaged the three relevant factors from the scale: the two gender identification factors and the gender stigma consciousness factor. This yielded a single score for which larger numerical values were indicative of greater stereotype threat vulnerability with regard to gender.

Post-Intervention Assessment

One post-test measure[3] is an end-of-unit folklore assessment to be administered to students in both the treatment and control conditions. We designed the unit assessment to align with both Virginia's Standards of Learning (SOLs) for third grade English and the learning objectives for the CLEAR Curriculum Folklore unit. In this way, the assessment would be

[3] This measure is used in addition to the other measures noted above which will be administered at the end of the two-year intervention for each cohort in Project PLACE.

equally fair to both students in the treatment schools who received the CLEAR Curriculum and students in the control schools who received traditional standards-based instruction.

Test development. To develop the assessment, we began by creating a table of specifications covering the eight objectives of the folklore unit, as well as the lessons in which each objective appeared. We then identified specific sub-standards of third grade SOLs 3.1, 3.2, 3.4, and 3.5 as relevant standards that would be covered in the control schools. Each staff member was assigned two or three lessons from the folklore unit and was then tasked with creating five assessment questions that covered the material from those lessons and aligned with the SOLs. We reviewed this bank of question items to ensure appropriate reading level. We were cautious to avoid questions that could only be answered by students who received the folklore curriculum; for instance, questions that required knowledge of the specific passages or experiences in the folklore unit were excluded from consideration. Finally, we verified that the correct answer for each question was clear and distinct from the distractor answer choices and that the questions stems were longer than the answer choices, as recommended by Thorndike and Thorndike-Christ (2010).

After revision of the items in the question bank and the reading passages, each team member conducted an independent review of the items based on two criteria: how well it represented the SOL and how well it represented the unit objectives for which it had been created. We compiled the feedback into a spreadsheet which was then reviewed by the principal investigators for Project PLACE.

The project team met again to revise the assessment based on the results of the independent reviews. We considered the independent ratings of the quality and content of each item. If all of the reviewers agreed the item was of high quality and was relevant to the table of

specifications, it was retained. If the reviewers agreed the item was of low quality and/or it was not aligned with the objectives or SOL(s), we deleted the item. If there was disagreement regarding the item, we revised the item as a team until it was deemed satisfactory. We then assigned the items to the final assessment in accordance with the weights in the table of specifications. The questions were reformatted for consistency before submitting to three external reviewers: a content expert, an assessment expert, and a former director of gifted programs. These individuals reviewed the assessment for clarity, accuracy, and recommended assessment features. The reviewers expressed minimal concerns, which were addressed through revisions. The final unit assessment consisted of thirty multiple-choice questions and five reading passages; not all questions were accompanied by a reading passage.

Scoring. Results on the folklore assessment were recorded as a raw score of correct answers out of the thirty possible questions on the assessment.

Specification of Regression Models

To what extent do motivation, self-efficacy, mindset, stereotype threat, gender, and exposure to a unit based on the CLEAR curriculum model predict literacy achievement of third-grade identified gifted students in rural areas? To investigate these factors noted in the literature that might contribute to gifted student achievement in rural areas, I used Stata 14 to conduct a series of exploratory regression analyses with various predictive models incorporating varied selections of the identified predictors. Therefore, to answer the primary research question, I began my analysis with the following model consisting of all predictors, including a covariate to control for prior achievement:

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + e_i$$

Achievement was student *i*'s quantitative score on the folklore post-assessment. Prior

achievement was measured as a student's total score on the Iowa Assessment. Motivation was measured by a teacher's numeric rating of student motivation using the SRBCSS Motivation scale, while self-efficacy, mindset, and stereotype threat were measured by student responses to the relevant pre-test measures. Gender was a qualitative variable and was coded 0 for male and 1 for female. Exposure to the folklore unit of the CLEAR Curriculum (the treatment condition) was also coded qualitatively, with 0 for students in control schools and 1 for those in treatment schools. Additional dummy indicators for districts were included in this model, as well as each subsequent regression described below. To control for missing values, binary missing indicators for each covariate were also included in each regression model.

I tested additional models incorporating interaction terms with the curriculum variable, based on covariates that, according to the literature, may have differential treatment effects:

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 curriculum_i \times mindset_i + e_i$$

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 curriculum_i \times motivation_i + e_i$$

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 curriculum_i \times gender_i + e_i$$

I considered the possibility of an interaction effect with curriculum for three predictors: mindset, motivation, and gender. Because incremental theorists believe intelligence can be improved through effort (Dweck, 2003), I hypothesized that students with an incremental mindset may be more likely to persevere in the face of a more challenging curriculum, such as the lessons in the folklore unit, which may then contribute to greater achievement on the post-assessment. Students with an entity mindset, on the other hand, may be less motivated to achieve academically (Lin-Siegler, Ahn, et al., 2016) due to their belief that outcomes are not directly

related to effort. As a result, they may be less likely to remain motivated in the face of a challenging curriculum, thereby possibly affecting their performance on the post-assessment. Similarly, students who are more motivated tend to be more likely to seek challenging tasks and persevere in the face of difficulties (Lin-Siegler, Dweck, & Cohen, 2016), which may contribute to their greater achievement. Therefore, there was a possibility for an interaction effect with curriculum on achievement. Finally, given the potential gender gap in English and language arts achievement (Dai et al., 1998), boys and girls may respond differently to exposure to the folklore unit of the CLEAR Curriculum. Therefore, I tested for an interaction effect between curriculum and gender.

Finally, I considered interaction effects with motivation by considering the following models:

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 motivation_i \times selfefficacy_i + e_i$$

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 motivation_i \times mindset_i + e_i$$

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 motivation_i \times gender_i + e_i$$

$$achievement_i = \beta_0 + \beta_1 priorachievement_i + \beta_2 motivation_i + \beta_3 selfefficacy_i + \beta_4 mindset_i + \beta_5 stereotype_i + \beta_6 gender_i + \beta_7 curriculum_i + \beta_7 motivation_i \times stereotype_i + e_i$$

I considered the possibility for an interaction between motivation and self-efficacy given prior research that has established self-efficacy as a predictor of performance, motivation, and academic resilience (Bandura, 1977; Martin & Marsh, 2006; Siegle & McCoach, 2007; Stevens et al., 2004). Similarly, an interaction between motivation and mindset was a relevant consideration given the correlation between mindset and the attribution of failure and success and, consequently, motivation (Lin-Siegler, Ahn, et al., 2016). Because motivation may be

affected by socialization to traditional gender domains (Dai et al., 1998), an interaction between motivation and gender was also considered. Finally, because increased stereotype threat is associated with holding an entity mindset (Callahan, 2012), which is consequently associated with a student's motivation (Lin-Siegler, Ahn, et al., 2016), an interaction between motivation and stereotype threat was analyzed, as well. Refer to Figure D1 in Appendix D for a conceptual model of the regression models tested.

The purpose of the exploratory regression analyses was to identify potentially important predictors of literacy achievement in identified gifted students in rural areas from among the total set of predictors listed in the research question. Additionally, I wanted to identify possible interactions between the treatment and student characteristics, as well as between motivation and student characteristics. To identify potentially important predictors, I considered both statistical and practical significance. In order to compare relative importance of the covariates, I looked at standardized coefficients. Once I identified the subset of predictors deemed to be potentially important, I conducted a secondary analysis of various models incorporating only these predictors. I also included interaction terms between the predictors and the curriculum variable, as indicated in the models above, to determine if there were heterogeneous treatment effects. In addition to interaction effects with curriculum, I also considered possible interaction effects with motivation, as described above. Interaction terms were added incrementally and I used the added interaction term's t-test value to determine its significance. To assess model fit, I used the root mean squared errors (RMSE), R-squared values, and Bayesian Information Criteria (BIC; Burnham & Anderson, 2004) to determine significance, with lower BIC and RMSE and higher R-squared values being preferable. If an interaction term proved to be significant, it was retained and I added the next interaction term from the models described above. If it was non-significant,

it was dropped and I proceeded to test the next interaction term.

Chapter IV

RESULTS

The initial sample size at the start of the study consisted of five treatment districts and five control districts and a total of 219 students. Two treatment districts dropped from the study, yielding a total of three treatment districts. Additionally, fifteen students were lost due to moving to a new district or declining to participate in the study. The final sample consisted of 180 students, 82 of whom were in treatment districts while the remaining 98 were in control districts. Refer to Appendix C for a description of the sample.

All participating districts in the present study were classified by their rurality and location in Virginia, in addition to at least 50% of students being eligible for free or reduced price lunch. Using data available through the Virginia Department of Education (2016a; 2016b; 2017) from the 2016-2017 school year, on average, there were approximately 3,300 students enrolled in each district, although student enrollment ranged from roughly 1,300 to around 5,600 among the districts. The percentage of students eligible for free or reduced price lunch was around 60% on average across all districts. While an average of 94.53% (*SD* = 3.43) of students in control districts were White, there was more diversity in the student population at treatment schools, where, on average, 60% (*SD* = 27.73) of students were White, 26.45% (*SD* = 21.09) were African American, and 10.06% (*SD* = 10.54) were Hispanic. The third grade reading pass rate on the Standards of Learning (SOL) assessment at the end of the year averaged 74.2% for the control districts and 69.0% for the treatment districts, indicating a slight academic advantage for students in the control schools, where the average advanced pass rate was also higher (14.4% in control districts and 12.0% in treatment districts). Refer to table C1 for means and standard deviations on all district-level characteristics.

Missing Covariate Information

In order to maximize use of the available data, I did not use case-wise deletion to handle missing data. Instead, observations were classified as either complete if all covariate data points were present or incomplete if at least one data point was missing. Refer to Appendix C for descriptive statistics regarding the measures for the sample of complete observations and a comparison of the complete and incomplete subgroups of observations. Refer to Appendix E for a correlation table for the pre-intervention measures used.

Regarding missing data from the efficacy scale, any individual items from the scale that were missing from a single student were excluded from the scoring process for that student and the formula for determining the average was adjusted accordingly. For instance, if a student answered 10 of the 11 items on the self-efficacy scale, his score was produced by calculating the sum of his responses and dividing by 10 rather than by 11. The same process was used for calculating each student's total mindset score, subscale scores for entity and incremental mindset, and stereotype threat vulnerability with regards to gender.

Attrition Analysis

Observations with no posttest scores were considered attrited cases. There were a total of 23 students (13%) with no posttest score; fourteen of these students were in control districts and nine were in treatment districts. Note that these were not necessarily students who dropped from the sample. Rather, attrited cases may have simply been the result of an absence on the day of the posttest administration. Refer to Table C3 for a comparison on baseline measures between observations with complete and incomplete posttest data. A comparison on baseline measures between treatment and control conditions reflected minimal differences between attrited cases in the treatment districts and their control district counterparts.

Pre-Intervention Measures

Based on scores from the present study, the internal consistency estimate for the overall mindset scale was .64, while the estimates for the entity and incremental subscales, when considered separately, were .77 and .73, respectively. The internal consistency estimate for the self-efficacy scale was .87 while that for stereotype threat with regards to gender was .81. Finally, the internal consistency estimate for the folklore objective assessment was .59 across all items.

To determine effect sizes on each covariate between the treatment and control groups, Cohen's d was calculated by subtracting the control group mean from the treatment group mean and then dividing by the standard deviation of the control group, $d = \frac{\bar{X}_T - \bar{X}_C}{s_C}$. This calculation would allow effect size to be interpreted in terms of treatment group deviation from the baseline control group. Using this procedure on the pre-intervention measures, the effect size was -.69 for prior achievement on the Iowa Assessment, -.08 for motivation, -.50 for self-efficacy beliefs, .06 for mindset, and .15 for gender stereotype threat. For both prior achievement and self-efficacy beliefs, students in the control group had higher scores than did students in the treatment group. Therefore, although districts were randomized, there was evidence that students in the control group may have been more academically advantaged at the start of the study than their treatment group counterparts.

Additive Regression Models

I regressed student results on the folklore assessment using the covariates identified under the Specification of Regression Models. Results of the additive regression analyses can be found in Table F1; the curriculum variable was retained for all models because it represented the treatment condition and excluding it might therefore lead to biased coefficients. Additionally, to

account for the hierarchical structure of the data resulting from a single district often encompassing multiple schools, I used Huber-White robust standard errors to deal with heteroscedasticity in the data structure. I then ran the same analyses using clustered standard errors to allow each school to have its own variance structure. While the clustered standard errors were likely more accurate, there were four observations with missing school identification data and the resulting standard errors were similar to those yielded by the robust standard errors. A comparison of the standard error values for the main effects model and for Model 2 can be found in Table F2.

Beginning with the main effects model, only prior achievement and mindset were statistically significant predictors of achievement on the folklore assessment ($p < .05$) and were therefore retained in the subsequent model. Gender was statistically significant ($p < .10$) level and because it has been associated in the literature with domain-specific achievement (Olszewski-Kubilius & Lee, 2011), I retained it for the second model, as well, but dropped it from the third model to adhere to a more conservative α-level. Finally, to test if prior achievement alone was enough to predict future achievement, I dropped mindset from the regression analysis in the fourth model.

Prior achievement was strongly predictive of achievement on the folklore assessment; for each increase of one standard deviation on the Iowa Assessments, students, on average, scored approximately two points higher (out of thirty) on the posttest, controlling for all other covariates. Although the standard deviation of folklore posttest scores was roughly eight points ($\bar{X} \approx 21$; see table C1), an increase in two points is notable given the maximum possible score of thirty points on the assessment. A stronger growth mindset was negatively associated with achievement on the folklore assessment after controlling for all other covariates in the model. An

increase in one standard deviation on the mindset scale (indicating a stronger growth mindset) was associated with a decrease in roughly .90 points on the posttest in all models, controlling for all other covariates. This points to the potentially more complicated interpretation of mindset alluded to in the literature (Callahan, 2012) and the possible benefit of not only a growth mindset, but also, in certain aspects, a fixed one. With regards to gender, after controlling for all other covariates, girls tended to outperform boys on the folklore assessment by nearly one point and this difference was statistically significant ($p < .10$).

From the models in Table F1, I selected Model 2 to use as a base model because it retained the predictors that were either statistically significant ($p < .05$) and the predictors that were practically significant, such as gender, whose coefficient was similar in magnitude to that of mindset. Furthermore, Model 2 maintained a high R-squared value and a low root mean squared error (RMSE) without any extraneous terms that did not contribute to additionally explained variance in the outcome. Model 2 was also associated with a lower BIC than Model 1. Based on this model, students in the treatment group performed, on average, .51 points higher on the folklore assessment than did students in the control group, controlling for all other covariates. Although this difference was not statistically significant, a difference of .51 points out of thirty in favor of students in the treatment group should be noted, particularly given the marked difference in prior achievement between the two groups at the start of the study (treatment group mean = 64.58; control group mean = 81.64). These results suggest a possible association between exposure to the place-based elements and high-level challenge of the CLEAR Curriculum (paired with a growth mindset intervention) and literacy achievement in identified gifted students. Refer to Figure D2 for a conceptual model illustrating the results of Model 2.

Interactive Regression Models

Using Model 2 in Table F1 as a base model, I tested various interaction terms with both curriculum and motivation, as described under Specification of Regression Models. Although neither curriculum nor motivation proved to be statistically significant predictors of achievement, I wanted to explore whether their interactions with other variables would prove to be otherwise based on the theoretical foundations in the literature. Refer to Table F3 for the results of these regression analyses. Using an incremental F-test on each interaction term, none of the interaction terms proved to be statistically significant ($p < .05$) and all of them were consequently dropped.

Chapter V

DISCUSSION

Numerous factors, including motivation, mindset, self-efficacy, stereotype threat vulnerability, gender, and curricula, have been noted in the literature to affect the achievement of identified gifted students and aid in the process of transforming potential into achievement. The purpose of this study was to explore, more specifically, the relationship between such factors and literacy achievement in young identified gifted students in rural schools.

At the start of the study, students in the control group had notably higher scores on a measure of prior achievement than their counterparts in the treatment group (refer to Table C1 in Appendix C). However, by the end of the study, following exposure to the CLEAR Curriculum folklore unit and after receiving the intervention promoting a growth mindset, students in the treatment group and students in the control group averaged the same score on their folklore objective assessment (23 out of 30). Although the present study does not aim to draw causal conclusions, it is worth noting the apparent growth experienced by students in the treatment group following exposure to a place-based and high-level challenging curriculum, despite the lack of statistical significance of the treatment variable in the regression analyses. Furthermore, while the exposure was only to one unit, it is possible that one unit, if appropriately engaging, might be sufficient in significantly altering a student's perspective of the learning process, to the extent that related factors, such as self-efficacy and motivation, are altered and, in turn, further promote the development of potential into achievement in future educational experiences. Essentially, the repercussions from one unit may prove to be more long-standing than a mere temporary interest in a topic.

As with the curriculum variable, some of the covariates tested did not prove to be statistically significant, namely motivation and self-efficacy. However, this should not immediately discount considering them as worthy catalysts for academic achievement. For instance, motivation and scores on the folklore posttest shared a correlation of roughly $r = .17$, while self-efficacy and posttest scores were correlated by $r = .13$. Although these are relatively weak correlations, these variables have a strong background of research support in their favor and should therefore continue to be investigated to better understand their role in promoting academic achievement. Additionally, it is possible that the influence of motivation, self-efficacy, and stereotype threat vulnerability may be masked because they already influence prior achievement scores, yielding a coefficient for prior achievement of a relatively greater magnitude. Therefore, while prior achievement is a significant predictor of future literacy achievement, it may be that several of the other covariates that were not statistically significant, such as motivation or self-efficacy, may be indirectly predictive of later achievement, as well. I will now focus on two covariates that did prove to be statistically significant in their prediction of academic achievement: prior achievement and mindset.

Prior Achievement

The importance of prior achievement as a factor promoting consequent literacy achievement is underscored in the results of the present study. Prior achievement, coupled with the treatment variable, sufficiently explained approximately 87% of the variance in student scores on the folklore posttest. Given that knowledge tends to build upon itself, it is not surprising that a strong foundation of prior knowledge would be so critical in ensuring future academic understanding and success. For students, then, who enter gifted programs with more limited prior knowledge and skills, such as English language learners or at-risk students, the

importance of scaffolding instruction becomes critical (Siegle et al., 2016). This conclusion is heavily supported by the literature resulting from studies with students from a variety of age groups and nations (Hemmings & Kay, 2010). In one such study, prior achievement, even from three years prior, was capable of explaining roughly half of the variance in elementary student math scores (Basque & Bouchamma, 2016). The measurement of prior achievement, however, should be taken with caution. Young, Worrell, and Gabelko (2011) found that although GPA was a significant predictor of achievement for students in a summer enrichment program, math grades were not, thereby suggesting a single grade given by a teacher in one subject may not be as representative of a student's readiness as their GPA across several classes. Therefore, in the present study, the use of the Iowa Assessments rather than grades to indicate prior achievement would hopefully allow for a more valid interpretation of prior achievement.

Another approach to understanding the significance of prior achievement can be seen in the reciprocal effects model (REM), in which academic self-concept is presumed to support academic achievement, which, in turn, further strengthens a student's academic self-concept (Seaton, Marsh, Parker, Craven, & Yeung, 2015). In a study involving academically advanced high school students, Seaton et al. (2015) found REM worked in the same way for advanced students whether they attended an academically selective school or not. Although students' general academic self-concept was not within the scope of the present study, the modest correlation (r = .35) between reading and writing self-efficacy and prior achievement observed could warrant additional exploration into the applicability of REM to young identified gifted students in rural schools.

It is important, as well, to distinguish between the relationship between prior achievement and the outcome and the relationship between aptitude and the outcome. The correlation

coefficient between the measure of prior achievement, the Iowa Assessment, and the measure of aptitude, the CogAT-V, was approximately .61. The correlation coefficient is moderately strong, but not strong enough to suggest these two measures assessed the same construct. In correlating each of these measures with the outcome, the folklore posttest, the results revealed a stronger correlation coefficient for the Iowa Assessment (r = .51) than for the CogAT-V (r = .40). Therefore, prior literacy achievement appears to be more strongly associated with future literacy achievement than does a child's overall aptitude. This suggests that domain-specific accomplishments and achievements may better shape a child's future success than their aptitude, which may be indicative of the importance of environment in shaping aptitude into achievement in order to promote success.

Mindset

The results from the present study regarding the importance of prior achievement are perhaps not surprising, but the results regarding mindset may be perceived as more unexpected. In the present study, an increase in one standard deviation on the mindset scale (interpreted as adopting a stronger growth mindset) was associated with a decrease, on average, of nearly one point on the folklore posttest (see Table F1 in Appendix F). Although this appears to be contrary to some of the literature that advocates a growth mindset as a catalyst for academic achievement (e.g., King, 2012), it is not entirely without support from other researchers (e.g., Bahník & Vranka, 2017) and may point instead to the potential benefits to be gained from students adopting elements from both a fixed and growth mindset.

There are several potential interpretations of the results of the present study concerning mindset as a factor promoting the development of gifted potential into achievement. The first concerns the potential complexity of our interpretation of the mindset construct. While some

researchers (Ablard, 2002; Dai & Feldhusen, 1996; Feldhusen & Dai, 1997) have found identified gifted students tend to hold growth mindsets, others (Mudrak, 2011; Snyder et al., 2013) have found they are more likely to hold fixed mindsets. Differences in conclusions may be attributed to a number of variations in these studies (e.g., different samples or measures), but they may also underlie a greater complexity in the interpretation and understanding of mindset. Traditionally, mindset has been viewed as a continuum, with incremental mindsets on one end and entity on the other (Ablard & Mills, 1995). Scales for measuring mindset have also been worded in general terms (e.g., Dweck, 2000) with no domain specification. In general, incremental mindsets have been viewed as the more favorable mindset to possess, while entity mindsets have been perceived as nonconductive for learning (Dweck & Leggett, 1988).

More recently, some of these beliefs about the nature and benefits of mindset have been questioned as researchers further investigate the underlying complexity of the mindset construct. For instance, some researchers (e.g., Sriram, 2014) have noted an individual's mindset may be mixed: an individual may possess an entity mindset in one domain but an incremental mindset in another. In the present study, the mindset scale was not domain-specific. Therefore, when reading items on the general mindset scale with no domain specificity, it would be impossible to know what context each student attributed to the question, and such contexts may not have been consistent across students. A student who was academically strong in English may have responded to the items with an English class context in mind, while another may have resorted to a class in which they struggled academically. The lack of domain specificity, therefore, may have muddled the interpretation of the results in the present study and overlooked the greater complexity behind the mindset construct.

Additionally, other researchers (e.g., Callahan, 2012) have raised the question of the benefits of an entity mindset in certain situations; the results of the present study similarly challenge the notion that a fixed mindset is necessarily non-conducive to learning. For instance, in the present study, mindset was assessed at the start of students' third-grade year, their first year in their school's gifted program. In a study by Makel et al. (2015), they found students generally believed giftedness to be more fixed than intelligence. This might result from an internalization of the label they receive, believing it to be a stable characteristic about themselves. If this holds true for the students in the present study, then it is possible that upon being labeled as gifted, the students who identified more strongly with their new label tended toward more of a fixed mindset. Their fixed mindset might therefore be interpreted as a strong belief and conviction in their own abilities in the classroom, which might be a positive force in favor of their achievement, thereby making a fixed mindset positively associated with achievement. If students believe their own giftedness to be fixed, they may also be emboldened to take academic risks when learning because they do not fear failure. Based on this interpretation, one could expect a positive correlation between an entity mindset and academic self-concept. Although this proved to be correct for the correlation between an entity mindset and reading and writing self-efficacy (r = .13), the correlation was weak and notably weaker than the correlation between an incremental mindset and self-efficacy (r = .35). Furthermore, reading and writing self-efficacy is different than a student's sense of overall academic self-concept, so the probability that a fixed mindset promoted academic achievement via greater academic self-concept is still possible, although further exploration would require data beyond the scope of the present study.

In addition to the complexity of the construct itself, the results regarding mindset should also be considered in light of the scale and the items themselves used to measure the construct. While these results may indicate the possibility that six items are not sufficient for validly assessing a construct as complex as mindset, they may also stem from the wording on the scale itself, as well as the consequent student interpretations of the individual items and their possible contextualization around each item. For instance, the items on the scale are all worded in terms of *change*, rather than *improvement*. For students who have just received the gifted label, they may interpret the idea of a change in how smart they are as a regression toward the mean for they may believe they are already as smart as they can possibly be. If these items were worded in a way that aligned more directly with the growth and fixed mindsets they were intended to assess—for instance, "You can always greatly *improve* how smart you are"—the resulting scores may differ significantly, particularly for identified gifted students who might misinterpret the items otherwise. Therefore, a fixed mindset score for students identified as gifted may actually be construed as a conviction in the belief that they do not believe themselves capable of regressing in terms of gifted potential. Such a belief could then be associated with greater academic performance because it could reflect greater fearlessness in the face of challenge. If students believe themselves to be incapable of losing intelligence or gifted potential, they may be more likely to then successfully engage in challenges, thus allowing a fixed mindset—as measured by the scale—to serve as a factor promoting their achievement. Further investigation into potential differences in results when using a scale with more growth-specific wording, in addition to cognitive interviews with students, would be warranted in better comprehending the construct of mindset, particularly as it applies and is interpreted by students identified as gifted.

Adding to the complexity of the mindset construct, I would like to raise the possibility that incremental and entity mindsets may not reside on the same scale but, instead, may each represent their own scale and that each individual possesses a certain degree of each mindset with regard to any given domain. The mindset scale was scored by reverse-coding the responses for the three incremental statements and maintaining original coding for the three entity statements. These were then averaged together so that a higher score indicated a stronger incremental mindset and a lower score was indicative of an entity mindset. If incremental and entity mindsets are truly opposites of one another, one would expect a perfect positive correlation between the mindset score and the score from the incremental items and a perfect negative correlation between the mindset score and the score from the entity items. After running the analyses, the correlation between mindset and the incremental items was strong (r = .66), as was the correlation between mindset and the entity items (r = -.78), but neither was perfect. Therefore, even if a student strongly agreed with a statement such as "How smart you are is something that you can't change very much," he or she didn't necessarily strongly disagree with the statement, "You can always greatly change how smart you are."

Furthermore, I reran the regression analysis for the final model but replaced the mindset covariate with a separate incremental mindset variable and an entity mindset variable. The results revealed the statistical significance (p < .05) of the incremental mindset variable but not of the entity mindset variable. Although these results alone do not provide sufficient grounds to ascertain the idea that incremental and entity mindsets do not reside on the same scale, I believe they do warrant further investigation in a future study to help establish the possible benefits of each type of mindset in promoting academic achievement.

One final consideration is that differences in growth and fixed mindsets may only be salient in the face of challenges (Blackwell et al., 2007) and in moments when students need to decide whether they will exert the effort necessary to attempt to overcome the challenge or not. As Blackwell et al. (2007) noted, in elementary school environments, which tend to be more supportive with less of an emphasis on failure, students with a fixed mindset may be protected from the potential negative consequences of maintaining a fixed view of intelligence. If this is the case, then students who expressed a fixed mindset may not be experiencing it as a negative factor against achievement and may even be experiencing it as a positive one if it is strengthening their sense of academic self-concept.

Recommendations

Based on the importance of prior achievement in promoting future achievement, a primary recommendation that stems from the present study is for schools to ensure sufficient scaffolding is implemented for students transitioning into a gifted program. Although students in the treatment group began the study with lower overall scores on the Iowa Assessment, their average on the folklore posttest surpassed that of the control group, even if slightly. It is possible that exposure to the CLEAR Curriculum unit provided sufficient differentiation and connections to students' prior knowledge via the provision of place-based elements, as well as high-level challenge, thereby helping students effectively bolster their formerly weaker performance relative to students in the control group.

Regarding mindset, I would also recommend exercising caution in assuming that promoting a growth mindset is sufficient for promoting student achievement. For instance, in the present study, students in the treatment group participated in a growth mindset intervention. Although I did not have post-intervention data on student mindsets, if a fixed mindset was more

significantly predictive of greater academic achievement, it may be that there is benefit to students receiving a more blended message about the advantages to each belief about intelligence and how best to apply these beliefs so they may manifest themselves productively in their actions regarding learning.

Additionally, given the correlation between prior achievement and mindset (r = .31), in studies investigating mindset, it would be important to control for prior achievement prior to drawing any conclusions about the nature of the relationship between a growth mindset and academic achievement. Otherwise, researchers may be attributing positive benefits to mindset that are actually stemming from variations in prior achievement. For instance, after running the regression analysis with mindset, the treatment variable, and the district indicators, the coefficient for mindset dropped in magnitude from nearly -.90 to -.43 ($p < .05$). Therefore, when not accounting for prior achievement, the relationship between a growth mindset and academic achievement may appear to be different than it would be otherwise. Given its significance in predicting later academic achievement, prior achievement should be controlled in studies investigating predictors of academic achievement in order to attain more accurate coefficients and interpretations.

Finally, the perceived growth in achievement for students in the treatment group whose levels of prior achievement were significantly lower at the start of the study serves as reason to recommend more place-based curricula for use with sub-populations of students for whom general curricula might bear limited relevance. Although the present study did not seek to establish causal connections between the folklore unit of the CLEAR Curriculum and student outcomes, for students in the treatment group to have demonstrated equal academic performance on the posttest despite their initial difference in the baseline comparison is notable. It signals the

possibility for personally engaging, challenging, and relevant curriculum to help bridge the gap between potential and performance.

Limitations

Some limits to the present study should be noted, first of which is the sample size. While not small, a sample size of 180 students falls short of ideal, especially given the number of predictors tested.

Additionally, I did not include a measure for fidelity of treatment in my regression analyses. Although it would be important to consider to what extent the CLEAR Curriculum folklore unit was implemented as intended, such a question went beyond the scope of the present study. As part of Project PLACE, treatment district teachers were asked to complete a log at the end of each folklore lesson to help the project team monitor fidelity and teachers' impressions of how the lesson progressed, but this data was not available at the time of the present study. Data collected from these logs would be important to consider in a future study, particularly given the importance of fidelity when implementing a curriculum (Callahan et al., 2015). For instance, did some teachers cut certain aspects of the curriculum out of concern the content might be too challenging for their students? Or, in other cases, did time restrictions mandate the elimination of certain portions of the curriculum? Such alterations to the intervention would be important to consider when assessing fidelity of the treatment implementation.

Similarly, a more in-depth analysis that controls for not only districts, but also teachers would have been useful, as teachers can play a critical role in fostering student motivation (Siegle, Rubenstein, & Mitchell, 2014). For instance, teachers with a background in gifted education may be more willing to challenge their students with a high-level curriculum while teachers without such a background might be more hesitant to do so and, through their

consequent adjustments to the curriculum, may reduce treatment fidelity. While all teachers in the treatment districts participated in a one-day orientation to the CLEAR Curriculum, differences in teacher background may have also impacted the implementation of the units. For example, teachers with more experience may be better capable of implementing the CLEAR Curriculum folklore unit as it was intended, while teachers who are newer to the profession may struggle more with the task of implementing lessons they did not create and incorporating strategies, such as differentiation, that may be more unfamiliar to them.

While this study was a quantitative one, an exploration into some of the more qualitative variables that might be related to student achievement was absent in this study, including family- or school-level variables, such as income and resources (Nonoyama-Tarumi, Hughes, & Willms, 2015). Such variables, while beyond the scope of the present study, might have aided in explaining additional variance in student outcomes. The exclusion of race from the regression models due to a lack of sufficient diversity may also have impacted the results, given the importance of race in predicting student achievement, even for identified gifted students (Plucker et al., 2010).

Finally, mindset, along with the pre-intervention measures, was assessed at the start of students' third-grade year. For the majority of participating students, the folklore posttest was administered toward the end of the fall semester. However, for one district—the largest participating district in the study—the folklore posttest was not administered until the end of the spring semester. Because the mindset intervention was conducted during the school year, for some students, by the time they took the posttest, they may have already experienced a shift in their mindset that would not be reflected in the mindset data collected. As a result, their mindset, as recorded from the pre-intervention measures, may be different from the mindset at the time of

the posttest and this difference may be more notable for students in the district that delayed the posttest. Consequently, the strength of the predictive relationship of mindset toward the posttest might differ across districts.

Further Research

The results of the present study raise numerous questions that could be explored in future studies, the majority of which revolve around mindset. First, how does mindset change with time after entrance into a gifted program? This question encompasses not only initial changes after entrance, but also long-term patterns of change. Does the mindset an identified gifted student possess tend to change according to a certain pattern with time? If so, does it differ significantly from the mindsets held by a student not identified as gifted? How do these patterns change according to academic settings (e.g., homogeneous grouping, mixed-ability, etc.), if at all?

In addition to exploring how mindset may change with time for identified gifted students, examining the mindset construct itself would be a worthy endeavor. According to the present study, it clearly maintains significance in predicting achievement, but the process by which this occurs remains unclear. Are incremental and entity theories part of the same continuum? Or, as I suggested earlier, are they two separate scales for which each individual has a measurable score, depending on the domain? In which situations might a fixed mindset be conducive to learning? For example, if a student has a fixed mindset regarding the strength of their capabilities, might this not give them the confidence to tackle more challenging problems? Although Mueller and Dweck (1998) posit that such a belief might lead to students wanting to avoid challenges in order to maintain their sense of self-worth, it appears, based on the results of the present study, that fixed mindsets do not always lead to challenge avoidance or poor academic performance. A related question to explore would be an investigation into the degree to which the mindset

indicated by a student on a scale aligns with the behavior they would exhibit when confronted with a challenge.

Finally, it is important to continue the exploration into the most significant predictors of student success, not only for the general population of students, but also for the sub-populations of students, such as identified gifted students in rural areas, who may easily be overlooked. These factors need not be limited to student-level predictors; an incorporation of teacher-level data, such as teacher mindset or self-efficacy relative to the content, would be worth considering. It is through a better understanding of how factors such as motivation, mindset, and self-efficacy relate to stronger academic outcomes that educators can better prepare stronger students for greater success.

References

Ablard, K. E. (2002). Achievement goals and implicit theories of intelligence among academically talented students. *Journal for the Education of the Gifted, 25*, 215-232.

Ablard, K. E., & Mills, C. J. (1995). Implicit theories of intelligence and self-perceptions of academically talented adolescents and children. *Journal of Youth and Adolescence, 25,* 137-148.

Abu-Hamour, B., & Al-Hmouz, H. (2013). A study of gifted high, moderate, and low achievers in their personal characteristics and attitudes toward school and teachers. *International Journal of Special Education, 28*(3), 5-15.

Alter, A. L., Aronson, J., Darley, J. M., Rodriguez, C., & Ruble, D. N. (2010). Rising to the threat: Reducing stereotype threat by reframing the threat as a challenge. *Journal of Experimental Social Psychology, 46,* 166-171.

Altintas, E., & Ozdemir, A. S. (2015). The effect of developed differentiation approach on the achievements of the students. *Eurasian Journal of Educational Research, 61,* 199-216. doi: 10.14689/ejer.2015.61.11

Ambady, N., Shih, M., Kim, A., & Pittinsky, T. L. (2001). Stereotype susceptibility in children: Effects of identity activation on quantitative performance. *Psychological Science, 12,* 385-390.

Andrade, H. L., Wang, X., Du, Y., & Akawi, R. L. (2009). Rubric-referenced self-assessment and self-efficacy for writing. *The Journal of Educational Research, 102,* 287-301.

Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology, 38,* 113-125. doi: 10.1006/jesp.2001.1491

Aronson, J., & Inzlicht, M. (2004). The ups and downs of attributional ambiguity: Stereotype vulnerability and the academic self-knowledge of African American college students. *Psychological Science*, *15*, 829-836.

Aronson, J., Lustina, M. J., Good, C., Keough, K., Steele, C. M., & Brown, J. (1999). When White men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of Experimental Social Psychology*, *35*, 29-46.

Aronson, J., & Steele, C.M. (2005). Stereotypes and the fragility of human competence, motivation, and self-concept. In C. Dweck & E. Elliot (Eds.), *Handbook of Competence & Motivation* (pp. 436-456). New York, Guilford.

Atalay, O., & Kahveci, N. G. (2015). An experimental study on effectiveness of integrated curriculum model (ICM) in social studies education for gifted and talented learners. *Educational Research and Reviews*, *10*, 1049-1062. doi: 10.5897/ERR2015.2151

Bailey, R., Pearce, G., Smith, C., Sutherland, M., Stack, N., Winstanley, C., & Dickenson, M. (2012). Improving the educational achievement of gifted and talented students: A systematic review. *Talent Development and Excellence*, *4*(1), 33-48.

Bahník, S., & Vranka, M. A. (2017). Growth mindset is not associated with scholastic aptitude in a large sample of university applicants. *Personality and Individual Differences*, *117*, 139-143. doi: 10.1016/j.paid.2017.05.046

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191-215.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307–337). Charlotte, NC: Information Age Publishing.

Basque, M., & Bouchamma, Y. (2016). Predictors of mathematics performance: The impact of prior achievement, socioeconomic status and school practices. International Studies in Educational Administration, 44(1), 85-104. Bell, A. (2007). Designing and testing questionnaires for children. *Journal of Research in Nursing*, *12*, 461–469. doi: 10.1177/17449871079616

Benbow, C. P., & Stanley, J. C. (1980). Sex differences in mathematical ability: Fact or artifact? *Science*, *210*, 1262-1264.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*, 246-263.

Bråten, I., & Strømsø, H. I. (2004). Epistemological beliefs and implicit theories of intelligence as predictors of achievement goals. *Contemporary Educational Psychology*, *29*, 371-388. doi: 10.1016/j.cedpsych.2003.10.001

Braun, M. T., & Oswald, F. L. (2011). Exploratory regression analysis: A tool for selecting models and determining predictor importance. *Behavior Research Methods*, *43*, 331-339. doi: 10.3758/s13428-010-0046-8

Budge, K. (2006). Rural leaders, rural places: Problem, privilege, and possibility. *Journal of Research in Rural Education*, *21*(13), 1-10.

Burney, V. H., & Cross, T. L. (2006). Impoverished students with academic promise in rural settings: 10 lessons from Project Aspire. *Gifted Child Today*, *29*(2), 14-21.

Burnham, K. P., & Anderson, D. R. (2004). Multimodel inference: Understanding AIC and BIC in model selection. *Sociological Methods Research, 33*, 261-304. doi: 10.1177/0049124104268644

Callahan, C. M. (2012). In closing. In R. F. Subotnik, A. Robinson, C. M. Callahan, & E. J. Gubbins (Eds.), *Malleable minds: Translating insights from psychology and neuroscience to gifted education* (pp. 267-269). Storrs, CT: National Research Center on the Gifted and Talented.

Callahan, C. M., Moon, T. R., Oh, S., Azano, A. P., & Hailey, E. P. (2015). What works in gifted education: Documenting the effects of an integrated curricular/instructional model for gifted students. *American Educational Research Journal*, *52*, 137-167. doi: 10.3102/0002831214549448

Clark, J. K., Eno, C. A., & Guadagno, R. E. (2011). Southern discomfort: The effects of stereotype threat on the intellectual performance of US southerners. *Self and Identity*, *10*, 248-262. doi: 10.1080/15298861003771080

Coleman, L. J., Micko, K. J., & Cross, T. L. (2015). Twenty-five years of research on the lived experience of being gifted in school: Capturing the students' voices. *Journal for the Education of the Gifted*, *38*, 358-376. doi: 10.1177/0162353215607322

Corbett, M. (2009). Rural schooling in mobile modernity: Returning to the places I've been. *Journal of Research in Rural Education*, *24*(7), 1-13.

Cramer, J., & Oshima, T. C. (1992). Do gifted females attribute their math performance differently than other students? *Journal for the Education of the Gifted*, *16*, 18-35.

Cross, T. L., & Burney, V. H. (2005). High ability, rural, and poor: Lessons from Project Aspire and implications for school counselors. *The Journal of Secondary Gifted Education*, *16*, 148-156.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1997). *Talented teenagers: The roots of success and failure*. Cambridge, United Kingdom: Cambridge University Press.

Dai, D. Y. (2000). To be or not to be (challenged), that is the question: Task and ego orientations among high-ability, high-achieving adolescents. *The Journal of Experimental Education, 68*, 311-330.

Dai, D. Y. (2002). Are gifted girls motivationally disadvantaged? Review, reflection, redirection. *Journal for the Education of the Gifted, 25*, 315-358.

Dai, D. Y. (2012). Giftedness in the making: A response to Ziegler and Phillipson. *High Ability Studies, 23*, 47-50.

Dai, D. Y., & Feldhusen, J. F. (1996). Goal orientations of gifted students. *Gifted and Talented International, 11*, 84-88.

Dai, D. Y., Moon, S. M., & Feldhusen, J. F. (1998). Achievement motivation and gifted students: A social cognitive perspective. *Educational Psychologist, 33*, 45-63. doi: 10.1080/00461520.1998.9653290

Delcourt, M. A. B., Cornell, D. G., & Goldberg, M. D. (2007). Cognitive and affective learning outcomes of gifted elementary school students. *Gifted Child Quarterly, 51*, 359-381. doi: 10.1177/0016986207306320

Dodge, B. (2015). *Welcome*. Retrieved from http://webquest.org

Dunbar, S., & Welch, C. (2015). *Iowa Assessments forms E and F: Research and development guide*. Orlando, FL: Houghton Mifflin Harcourt Publishing Company.

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., . . . Japel, C. (2007). School readiness and later achievement. *Developmental Psychology, 43*, 1428–1446. http://dx.doi.org/ 10.1037/0012-1649.43.6.1428

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.

Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.

Dweck, C. S. (2003). Beliefs that make smart people dumb. In R. J. Sternberg (Ed.), *Why smart people can be so stupid* (pp. 24-41). New Haven, CT: Yale University Press.

Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. Mussen & E. M. Hetherington (Eds.), *Handbook of child psychology, socialization, personality and social development* (pp. 643-691). Hoboken, NJ: Wiley.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95,* 256-273.

Ehrlinger, J., Mitchum, A. L., & Dweck, C. S. (2016). Understanding overconfidence: Theories of intelligence, preferential attention, and distorted self-assessment. *Journal of Experimental Social Psychology, 63,* 94-100. doi: 10.1016/j.jesp.2015.11.001

Erdley, C. A., Cain, K. M., Loomis, C. C., Dumas-Hines, F., & Dweck, C. S. (1997). Relations among children's social goals, implicit personality theories, and responses to social failure. *Developmental Psychology, 33,* 263-272.

Feldhusen, J. F., & Dai, D. Y. (1997). Gifted students' attitudes and perceptions of the gifted label, special programs, and peer relations. *The Journal of Secondary Gifted Education, 9,* 15-20.

Fletcher, K. L., & Speirs Neumeister, K. L. (2012). Research on perfectionism and achievement motivation: Implications for gifted students. *Psychology in the Schools, 49,* 668-677. doi: 10.1002/pits.21623

Ford, D. Y., Harris III, J. J., Tyson, C. A., & Trotman, M. F. (2002). Beyond deficit thinking: Providing access for gifted African American students. *Roeper Review, 24,* 52-58.

Freeman, J. (2003). Gender differences in gifted achievement in Britain and the U.S. *Gifted Child Quarterly, 47,* 202-211.

Gagné, F. (1995). From giftedness to talent: A developmental model and its impact on the language of the field. *Roeper Review, 18,* 103-111.

Gagné, F. (2000) Understanding the complex choreography of talent development through DMGT-based analysis. In: K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik (Eds.) *International handbook of giftedness and talent* (pp. 67-80). Oxford, United Kingdom: Elsevier Science.

Gallagher, J. J. (2015). Psychology, psychologists, and gifted students. *Journal for the Education of the Gifted, 38,* 6-17. doi: 10.1177/0162353214565548

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Applied Developmental Psychology, 24,* 645-662. doi: 10.1016/j.appdev.2003.09.002

Guskin, S. L., Okolo, C., Zimmerman, E., & Peng, C.-Y. J. (1986). Being labeled gifted or talented: Meanings and effects perceived by students in special programs. *Gifted Child Quarterly, 30,* 61-65. doi: 10.1177/001698628603000203

Hardre, P. L., & Reeve, J. (2003). A motivational model for rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology, 95,* 347-356. doi: 1037/0022-0663.95.2.347

Hatano, G., & Oura, Y. (2003). Reconceptualizing school learning using insight from expertise research. *Educational Researcher, 32,* 26-29.

Hébert, T. P., & Beardsley, T. M. (2001). Jermaine: A critical case study of a gifted black child living in rural poverty. *Gifted Child Quarterly*, *45*, 85-103.

Heller, K. A., & Ziegler, A. (1996). Gender differences in mathematics and the sciences: Can attributional retraining improve the performance of gifted females? *Gifted Child Quarterly*, *40*, 200-210.

Hemmings, B., & Kay, R. (2010). Prior achievement, effort, and mathematics attitude as predictors of current achievement. *The Australian Educational Researcher*, *37*(2), 41-58.

Hernández Finch, M. E., Speirs Neumeister, K. L., Burney, V. H., & Cook, A. L. (2014). The relationship of cognitive and executive functioning with achievement in gifted kindergarten children. *Gifted Child Quarterly*, *58*, 167-182. doi: 10.1177/0016986214534889

Hertzog, N. B. (2003). Impact of gifted programs from the students' perspectives. *Gifted Child Quarterly*, *47*, 131-143. doi: 10.1177/001698620304700204

Hidi, S., Berndorff, D., & Ainley, M. (2002). Children's argument writing, interest, and self-efficacy: An intervention study. *Learning and Instruction*, *12*, 429-446.

Hong, E., & Aqui, Y. (2004). Cognitive and motivational characteristics of adolescents gifted in mathematics: Comparisons among students with different types of giftedness. *Gifted Child Quarterly*, *48*, 191-201. doi:10.1177/001698620404800304

Hong, Y.-Y., Chiu, C.-Y., Dweck, C. S., Lin, D. M.-S., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology, 77*, 588-599.

Hong, H.-Y., & Lin-Siegler, X. (2012). How learning about scientists' struggles influences students' interest and learning in physics. *Journal of Educational Psychology, 104*, 469-484. doi: 10.1037/a0026224

Hyde, J. S., Fennema, E., & Lamon, S. J. (1990). Gender differences in mathematics performance: A meta-analysis. *Psychological Bulletin, 107*, 139-145.

Iowa Testing Programs (2013). *Iowa Assessments Levels 9-14: Directions for administration*. Rolling Meadows, IL: Riverside.

Jarvis, J. M. (2009). Planning to unmask potential through responsive curriculum: The "famous five" exercise. *Roeper Review, 31*, 234-241. doi: 10.1080/02783190903177606

Junge, M. E., & Dretzke, B. J. (1995). Mathematical self-efficacy gender differences in gifted/talented adolescents. *Gifted Child Quarterly, 39*, 22-26.

Kanli, E., & Emir, S. (2013). The effect of problem based learning on gifted and normal students' achievement and creativity levels. *Necaitbey Faculty of Education Electronic Journal of Science and Mathematics Education, 7*(2), 18-45.

Kaplan, S. (2013). Depth and complexity. In C. M. Callahan & H. L. Hertberg-Davis (Eds.), *Fundamentals of gifted education* (pp. 277–286). New York, NY: Routledge.

Kerr, B., Colangelo, N., & Gaeth, J. (1988). Gifted adolescents' attitudes toward their giftedness. *Gifted Child Quarterly, 32*, 245-247. doi: 10.1177/001698628803200201

Kim, K. H. (2008). Underachievement and creativity: Are gifted underachievers highly creative? *Creativity Research Journal, 20*, 234-242. doi: 10.1080/10400410802060232

Kim, M. (2016). A meta-analysis of the effects of enrichment programs on gifted students. *Gifted Child Quarterly, 60*, 102-116. doi: 10.1177/0016986216630607

King, R. B. (2012). How you think about your intelligence influences how adjusted you are: Implicit theories and adjustment outcomes. *Personality and Individual Differences, 53,* 705-709. doi: 10.1016/j.paid.2012.05.031

Kramer, L. R. (1991). The social construction of ability perceptions: An ethnographic study of gifted adolescent girls. *The Journal of Early Adolescence, 11,* 340-362. doi: 10.1177/0272431691113003

Levy, S. R., Stroessner, S. J., & Dweck, C. S. (1998). Stereotype formation and endorsement: The role of implicit theories. *Journal of Personality and Social Psychology, 74,* 1421-1436.

Li, A. K. F., & Adamson, G. (1995). Motivational patterns related to gifted students' learning of mathematics, science, and English: An examination of gender differences. *Journal for the Education of the Gifted, 18,* 284-297.

Lin-Siegler, X., Ahn, J., Chen, J., Fang, F.-F. A., & Luna-Lucero, M. (2016). Even Einstein struggled: Effects of learning about great scientists' struggles on high school students' motivation to learn science. *Journal of Educational Psychology, 108,* 314-328. doi: 10.1037/edu0000092

Lin-Siegler, X., Dweck, C. S., & Cohen, G. L. (2016). Instruction interventions that motivate classroom learning. *Journal of Educational Psychology, 108,* 295-299. doi: 10.1037/edu0000124

Lockette, T. (2010). Tapping the power of place. *Education Digest, 76*(4), 59-62.

Lohman, D. F. (2012). *Cognitive Abilities Test Form 7: Research and development guide.* Rolling Meadows, IL: The Riverside Publishing Company.

Brookings Institution. (2015). *The 2015 Brown Center report on American education: How well are American students learning?* Washington, DC: Tom Loveless.

Lüftenegger, M., Kollmayer, M., Bergsmann, E., Jöstl, G., Spiel, C., & Schober, B. (2015). Mathematically gifted students and high achievement: The role of motivation and classroom structure. *High Ability Studies*, *26*, 227-243, doi: 10.1080/13598139.2015.1095075

Lummis, M., & Stevenson, H. W. (1990). Gender differences in beliefs and achievements: A cross-cultural study. *Developmental Psychology*, *26*, 254-263.

Makel, M. C., Snyder, K. E., Thomas, C., Malone, P. S., & Putallaz, M. (2015). Gifted students' implicit beliefs about intelligence and giftedness. *Gifted Child Quarterly*, *59*, 203-212. doi: 10.1177/0016986215599057

Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, *43*, 267-281. doi: 10.1002/pits

McCoach, D. B., & Siegle, D. (2003). Factors that differentiate underachieving gifted students from high-achieving gifted students. *Gifted Child Quarterly*, *47*, 144-154.

Meier, E., Vogl, K., & Preckel, F. (2014). Motivational characteristics of students in gifted classes: The pivotal role of need for cognition. *Learning and Individual Differences*, *33*, 39-46. doi: 10.1016/j.lindif.2014.04.006

Moon, T. R., & Park, S. (2016). Fidelity of intervention of English/language arts elementary curriculum for gifted students: An exploratory investigation in different service delivery models. *Journal for the Education of the Gifted*, *39*, 62-79. doi: 10.1177/0162353215624161

Morisano, D., & Shore, B. M. (2010). Can personal goal setting tap the potential of the gifted underachiever? *Roeper Review, 32,* 249-258. doi: 10.1080/02783193.2010.508156

Mudrak, J. (2011). 'He was born that way': Parental constructions of giftedness. *High Ability Studies, 22,* 199-217. doi: 10.1080/13598139.2011.622941

Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology, 75,* 33-52.

National Center for Education Statistics. (n.d.). *Common core of data* [Data file]. Retrieved from https://nces.ed.gov/ccd/districtsearch/

Nonoyama-Tarumi, Y., Hughes, K., & Willms, J. D. (2015). The role of family background and school resources on elementary school students' mathematics achievement. *Prospects, 45,* 305-324. doi: 10.1007/s11125-015-9362-1

Olszewski-Kubilius, P., & Lee, S.-Y. (2011). Gender and other group differences in performance on off-level tests: Changes in the 21st century. *Gifted Child Quarterly, 55,* 54-73. doi: 10.1177/0016986210382574

Olszewski-Kubilius, P., & Turner, D. (2002). Gender differences among elementary school-aged gifted students in achievement, perceptions of ability, and subject preference. *Journal for the Education of the Gifted, 25,* 233-268.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66,* 543-578.

Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading and Writing Quarterly, 19,* 139-158. doi: 10.1080/10573560390143085

Pajares, F., Johnson, M. J., & Usher, E. L. (2007). Sources of writing self-efficacy beliefs of elementary, middle, and high school students. *Research in the Teaching of English, 42,* 104-120.

Pajares, F., Miller, M. D., & Johnson, M. J. (1999). Gender differences in writing self-beliefs of elementary school students. *Journal of Educational Psychology, 91,* 50-61.

Park, D., Gunderson, E. A., Tsukayama, E., Levine, S. C., & Beilock, S. L. (2016). Young children's motivational frameworks and math achievement: Relation to teacher-reported instructional practices, but not teacher theory of intelligence. *Journal of Educational Psychology, 108,* 300-313. doi: 10.1037/edu0000064

Phan, H. P. (2012). The development of English and mathematics self-efficacy: A latent growth curve analysis. *The Journal of Educational Research, 105,* 196-209. doi: 10.1080/00220671.2011.552132

Phillips, N., & Lindsay, G. (2006). Motivation in gifted students. *High Ability Studies, 17,* 57-73. doi: 10.1080/13598130600947119

Picho, K., & Brown, S. W. (2011). Can stereotype threat be measured? A validation of the Social Identities and Attitudes Scale (SIAS). *Journal of Advanced Academics, 22,* 374-411.

Plucker, J. A., Burroughs, N. A., & Song, R. (2010). *Mind the (other) gap! The growing excellence gap in K-12 education.* Bloomington, IN: Center for Evaluation and Education Policy.

Preckel, F., Goetz, T., Pekrun, R., & Kleine, M. (2008). Gender differences in gifted and average-ability students: Comparing girls' and boys' achievement, self-concept, interest, and motivation in mathematics. *Gifted Child Quarterly, 52,* 146-159. doi: 10.1177/0016986208315834

Provasnik, S., KewalRamani, A., Coleman, M. M., Gilbertson, L., Herring, W., & Xie, Q. (2007). Status of education in rural America (NCES 2007-040). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Rastegar, A., Jahromi, R. G., Haghighi, A. S., & Akbari, A. R. (2010). The relation of epistemological beliefs and mathematics achievement: The mediating role of achievement goals, mathematics self-efficacy, and cognitive engagement. *Procedia Social and Behavioral Sciences*, *5*, 791-797.

Reis, S. M., & Morales-Taylor, M. (2010). From high potential to gifted performance: Encouraging academically talented urban students. *Gifted Child Today*, *33*, 28-38.

Renzulli, J. S. (2012). Reexamining the role of gifted education and talent development for the 21st century: A four-part theoretical approach. *Gifted Child Quarterly*, *56*, 150-159. doi: 10.1177/0016986212444901

Renzulli, J. S., Hartman, R. K., & Callahan, C. M. (1971). Teacher identification of superior students. *Exceptional Children*, *38*, 211-214.

Renzulli, J. S., & Reis, S. M. (1985). *The Schoolwide Enrichment Model: A comprehensive plan for educational excellence*. Mansfield Center, CT: Creative Learning Press.

Renzulli, J. S., Smith, L. H., White, A. J., Callahan, C. M., & Hartman, R. K. (1976). *Scales for rating the behavioral characteristics of superior students*. Mansfield Center, CT: Creative Learning Press, Inc.

Renzulli, J. S., Smith, L. H., White, A. J., Callahan, C. M., Hartman, R. K., Westberg, K. L., … Sytsma Reed, R. E. (2010). *Scales for rating the behavioral characteristics of superior students: Technical and administration manual*. Waco, TX: Prufrock Press Inc.

Ritchotte, J. A., Matthews, M. S., & Flowers, C. P. (2014). The validity of the achievement-orientation model for gifted middle school students: An exploratory study. *Gifted Child Quarterly, 58,* 183-198. doi:10.1177/0016986214534890

Ritchotte, J., Rubenstein, L., & Murry, F. (2016). Reversing the underachievement of gifted middle school students: Lessons from another field. *Gifted Child Today, 38,* 103-113. doi: 10.1177/1076217514568559

Ritchotte, J. A., Suhr, D., Alfurayh, N. F., & Graefe, A. K. (2016). An exploration of the psychosocial characteristics of high achieving students and identified gifted students: Implications for practice. *Journal of Advanced Academics, 27,* 23-38. doi: 10.1177/1932202X15615316

Roberts, S. M., & Lovett, S. B. (1994). Examining the "F" in gifted: Academically gifted adolescents' physiological and affective responses to scholastic failure. *Journal for the Education of the Gifted, 17,* 241-259.

Schroder, H. S., Moran, T. P., Donnellan, M. B., & Moser, J. S. (2014). Mindset induction effects on cognitive control: A neurobehavioral investigation. *Biological Psychology, 103,* 27-37. doi: 10.1016/j.biopsycho.2014.08.004

Schwartz, D. L., Cheng, K. M., Salehi, S., & Wieman, C. (2016). The half empty question for socio-cognitive interventions. *Journal of Educational Pscyhology, 108,* 397-404. doi: 10.1037/edu0000122

Schwery, D., Hulac, D., & Schweinle, A. (2016). Understanding the gender gap in mathematics achievement: The role of self-efficacy and stereotype threat. *School Psychology Forum: Research in Practice,* 10, 386-396.

Seaton, M., Marsh, H. W., Parker, P. D., Craven, R. G., & Yeung, A. S. (2015). The reciprocal effects model revisited: Extending its reach to gifted students attending academically selective schools. *Gifted Child Quarterly, 59,* 143-156. doi: 10.1177/0016986215583870

Shell, D. F., Colvin, C., & Bruning, R. H. (1995). Self-efficacy, attribution, and outcome expectancy mechanisms in reading and writing achievement: Grade-level and achievement-level differences. *Journal of Educational Psychology, 87,* 386-398.

Shell, D. F., Murphy, C. C., & Bruning, R. H. (1989). Self-efficacy and outcome expectancy mechanisms in reading and writing achievement. *Journal of Educational Psychology, 81,* 91-100.

Siegle, D. (2015). Dr. James Gallagher's concern for gifted learners beyond academics. *Journal for the Education of the Gifted, 38,* 58-63. doi: 10.1177/0162353214565554

Siegle, D., Gubbins, E. J., O'Rourke, P., Langley, S. D., Mun, R. U., Luria, S. R., … Plucker, J. A. (2016). Barriers to underserved students' participation in gifted programs and possible solutions. *Journal for the Education of the Gifted, 39,* 103-131. doi: 10.1177/0162353216640930

Siegle, D., & McCoach, D. B. (2007). Increasing student mathematics self-efficacy through teacher training. *Journal of Advanced Academics, 18,* 278-312.

Siegle, D., Rubenstein, L. D., & Mitchell, M. S. (2014). Honors students' perceptions of their high school experiences: The influence of teachers on student motivation. *Gifted Child Quarterly, 58,* 35-50. doi: 10.1177/0016986213513496

Smith, G. A. (2002). Place-based education: Learning to be where we are. *Phi Delta Kappan, 83,* 584-594. doi: 10.1177/003172170208300806

Smith, L.V., & Cokley, K. (2016). Stereotype threat vulnerability: A psychometric investigation of the Social Identities and Attitudes Scale. *Measurement and Evaluation in Counseling and Development*, *49*, 145-162. doi: 10.1177/0748175615625752

Snyder, K. E., Barger, M. M., Wormington, S. V., Schwartz-Bloom, R., & Linnenbrink-Garcia, L. (2013). Identification as gifted and implicit beliefs about intelligence: An examination of potential moderators. *Journal of Advanced Academics*, *24*, 242-258. doi: 10.1177/1932202X13507971

Sriram, R. (2014). Rethinking intelligence: The role of mindset in promoting success for academically high-risk students. *Journal of College Student Retention*, 15, 515-536. doi: 10.2190/CS.15.4.c

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613-629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*, 797-811.

Sternberg, R. J. (2001). Giftedness as developing expertise: A theory of the interface between high abilities and achieved excellence. *High Ability Studies*, *12*, 159-179. doi: 10.1080/13598130120084311

Stevens, T., Olivarez Jr., A., Lan, W. Y., & Tallent-Runnels, M. K. (2004). Role of mathematics self-efficacy and motivation in mathematics performance across ethnicity. *The Journal of Educational Research*, *97*, 208-221.

Stoeger, H., Steinbach, J., Obergriesser, S., & Matthes, B. (2014). What is more important for fourth-grade primary school students for transforming their potential into achievement:

The individual or the environmental box in multidimensional conceptions of giftedness? *High Ability Studies*, *25*, 5-21. doi: 10.1080/13598139.2014.914381

Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking giftedness and gifted education: A proposed direction forward based on psychological science. *Psychological Science in the Public Interest*, *12*, 3-54. doi: 10.1177/1529100611418056

Thorndike, R. M., & Thorndike-Christ, T. (2010). *Measurement and evaluation in psychology and education*. Boston, MA: Pearson Education, Inc.

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms (2nd ed.).* Alexandria, VA: Association for Supervision and Curriculum Development.

U.S. Department of Education. (2004). *Title IX – general provisions* (No Child Left Behind Act, P.L. 107-110 (Title IX, Part A, Definition 22)). Retrieved from http://www2.ed.gov/policy/elsec/leg/esea02/pg107.html

U.S. Department of Education. (2012). *Documentation to the NCES Common Core of Data Public Elementary/Secondary School Universe Survey: School year 2010-11* (NCES 2012-338rev). Retrieved from https://nces.ed.gov/ccd/pdf/psu102agen.pdf

van der Meulen, R. T., van der Bruggen, C. O., Spilt, J. L., Verouden, J., Berkhout, M., & Bögels, S. M. (2014). The pullout program day a week school for gifted children: Effects on social-emotional and academic functioning. *Child Youth Care Forum*, *43*, 287-314. doi: 10.1007/s10566-013-9239-5

VanTassel-Baska, J., Zuo, L., Avery, L. D., & Little, C. A. (2002). A curriculum study of gifted-student learning in the language arts. *Gifted Child Quarterly*, *46*, 30-44.

Virginia Department of Education (2016a). *2016-2017 Fall Membership by Division & Ethnicity* [Data file]. Retrieved from

http://www.doe.virginia.gov/statistics_reports/enrollment/fall_membership/report_data.shtml

Virginia Department of Education (2016b). *School Year 2016-2017 National School Lunch Program (NSLP) Free and Reduced Price Eligibility Report* [Data file]. Retrieved from http://www.doe.virginia.gov/support/nutrition/statistics/free_reduced_eligibility/2016-2017/divisions/frpe_div_report_sy2016-17.pdf

Virginia Department of Education (2017). *2016-2017 Division Test-by-Test Percent Passing & Percent Advanced (8/15/2017)* [Data file]. Retrieved from http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml

Vlahovic-Stetic, V., Vidovic, V. V., & Arambasic, L. (1999). Motivational characteristics in mathematical achievement: A study of gifted high-achieving, gifted underachieving and non-gifted pupils. *High Ability Studies*, *10*, 37-49.

Webb, A. F., Vandiver, B. J., & Jeung, S. (2016). Does completing an enriched writing course improve writing self-efficacy of talented secondary students? *Gifted Child Quarterly*, *60*, 47-62. doi: 10.1177/0016986215605359

Wellisch, M., & Brown, J. (2013). Many faces of a gifted personality: Characteristics along a complex gifted spectrum. *Talent Development and Excellence*, *5*(2), 43-58.

Wilson, T. D., & Buttrick, N. R. (2016). New directions in social psychological interventions to improve academic achievement. *Journal of Educational Psychology*, *108*, 392-396. doi: 10.1037/edu0000111

Young, A. E., Worrell, F. C., & Gabelko, N. H. (2011). Predictors of success in accelerated and enrichment summer mathematics courses for academically talented adolescents. *Journal of Advanced Academics*, 22, 558-577. doi: 10.1177/1932202X11413886

Appendix A

"Folklore and Fairytales: The Art of Storytelling"

The folklore unit of the CLEAR Curriculum is designed to introduce students to storytelling through folklore and fairytales, as well as the purpose of folklore to communicate societal norms and cultural mores. Students study these big ideas through their roles as folklorists, storytellers, and originators of literary tales. In addition to learning about folklores, students rehearse their reading and writing skills, as well as reinforce their comprehension of narrative elements. The culminating project is a Folklore Festival, in which each student embodies the role of a profession related to folklore and collaborate in the execution of a festival for an audience. Refer to Table A1 for an overview of the lessons encompassed by the folklore unit, in addition to examples of interwoven elements of place.

Table A1

Overview of Lessons in the CLEAR Curriculum Folklore Unit

Lesson	Description	Examples of Place Elements
Lesson 1	Students complete the unit pre-assessment. The teacher initiates a discussion on what a fairytale is and then reads a fable to the students. Students write a summary of the story and begin learning the vocabulary associated with the unit. Students complete a concept map related to the various forms of folklore.	Students are encouraged to take their Folklorist Journals with them and take note of anything they observe in their community. They also think of different types of stories that are told in their community. They are encouraged to bring in examples of folklore that has been written by local authors.
Lesson 2[a]	The teacher reads a fable to the students, who then discuss the moral of the story. Students learn about the purpose of folklore. The teacher reads a fairytale to the students, who then compare and contrast the two stories. Students learn about simple and complex folktales. Students learn about how storytelling helps listeners learn new things,	N/A

	thus yielding an infinite amount of knowledge they are capable of learning. They also learn about how the brain reacts to hearing a story.	
Lesson 3	Students complete a formative assessment then listen to the teacher read a fairytale. They learn about empathy and sympathy. They also learn about universal motifs that are common in folklore and learn more specifically about fairytales.	Students are encouraged to share their own experiences with empathy versus sympathy. They also think of examples of situations that may be specific to where they live.
Lesson 4[a]	Students learn about formulaic openings and character types for fairytales. They learn about stereotypes and consider how stereotypes about people can be harmful, particularly with regards to stereotypes about intelligence. They also reflect on stereotypes they have heard about living in a county or in a city.	Students are asked if there is a wooded area near their home, as well as the fairytale-like qualities of that area.
Lesson 5	The teacher reads a fable to the students. Students discuss what cultural norms are, as well as the difference between objective and subjective culture. Students reflect on their own culture and participate in a word sort of adjectives and character types and an activity in which they sort different stories. They complete a formative assessment at the end.	Students consider how members of their community prepare for each season. They also consider how their culture may appear to outsiders. Students are encouraged to observe people in their community for signs of objective or subjective culture.
Lesson 6	The teacher reads a fairytale to the students. Students learn about variants in folktales between cultures.	The fairytale told here is an Appalachian folktale variant of *Cinderella*. The region of Appalachia includes the community in which the students live. Students also consider if there are variants of *Cinderella* that exist in their community.
Lesson 7	The teacher reads a fairytale to the students, who then reflect on the formulaic elements in the story. They also learn about folklorists as collectors of stories, in addition to learning about specific well-known folklorists.	N/A

Lesson 8	The teacher reads a fairytale to the students, who then analyze the sequence of events. Students work in small groups to analyze stories based on readiness, after which they learn about motifs and type-indexing.	Students learn about a Cherokee folktale. They are also prompted to ask a member of their community about their favorite story to identify any recurring motifs. Finally, they are encouraged to identify folktales told in their community and what their type-index might be.
Lesson 9	The teacher reads the students a fable, after which they discuss culture and learn about storytelling in different cultures in the world. They learn about the three main folklore jobs that will be represented in the Folklore Festival.	The teacher can encourage students to begin thinking about their own community culture. They are also encouraged to think of a favorite story or favorite local author.
Lesson 10	Students learn about compound words and how storytellers can change words to suit their audience. The teacher reads a fairytale to the class, emphasizing the importance of delivery, using jokes and ghost stories as illustrative examples.	Students are asked to consider details about their own lives that are clearly tied to their location. They are also encouraged to think of jokes or ghost stories told in their community.
Lesson 11	Students learn about story openers. They hear a fairytale and work on visualizing what is being read aloud. They learn about limiting and evocative adjectives and practice writing with strong imagery. They complete a formative assessment.	Students consider how stories typically begin in the area where they live. They are encouraged to work with adjectives to describe people, places, or events in their community.
Lesson 12	Students continue to explore the importance of delivery and audience in storytelling. They participate in a Reader's Theater, in which they practice delivering an oral story to a small group.	To illustrate good storytelling, the teacher may read an excerpt of a story set in a rural area. Students are also encouraged to write an original story based on where they live or a community moral.
Lesson 13	The teacher shares two fairytales with the class and asks students to compare them. Students practice creating a story diagram and learn about retellers.	Students consider how they would tell stories about their own experiences differently to individuals in their community

		as opposed to those outside of it. They also think of stories that may have been told in their communities for many generations and how the written and the oral forms may have differed.
Lesson 14	The teacher reads two versions of the same fairytale to the students, who then compare and contrast them. They learn about the importance of word choice and practice brainstorming stronger versions of simpler words. They learn about literary tellers and salons, as well as fairytale structure. They begin writing their own folktale.	Students think about words that are commonly used where they live. They are prompted to think of how they may have had to change something about themselves, such as their dialect, to fit in somewhere else. When it comes to writing their own story, they are encouraged to make it about where they live.
Lesson 15	Students hear from a guest literary teller, preferably from their own community. Students continue writing their own folktale. Students begin brainstorming which profession they would like to have in the Folklore Festival.	Students are encouraged to think about stories in their community that need to be told. The teacher may also invite a local storyteller to class to share local folklore with the students.
Lesson 16	Students learn about fakelore. They begin moving through the rotations depending on their role (folklorist, storyteller, or literary teller) for their professional folklore work.	Students learn about the story of Paul Bunyan—a well-known character from a rural background—as an example of fakelore.
Lesson 17	Students reflect on the difference between a folklorist and a storyteller. They continue working in their professional learning groups.	Students consider if telling stories in a way other than orally detracts from the place in which the story was first told. They are also encouraged to consider their audience at the Folklore Festival as they work.
Lesson 18	Students finish their work in their professional learning groups. They review the rubric for their folklore performance.	For the final anthology, students write a short biography about each student and where they're from. They are encouraged to emphasize

		how place may have influenced their story.
Lessons 19 and 20	Students perform in the Folklore Festival.	N/A

[a] Denotes a lesson in which messages promoting a growth mindset have been incorporated.

Appendix B

Identification Procedures of Participating Districts

We relied on the results of the CogAT and SRBCSS to identify students to receive gifted services for Project PLACE. However, this identification procedure was designed to supplement the pre-existing procedures in place at each district. Refer to Table B1 for information regarding the identification measures traditionally used in each of the participating school districts. Unless otherwise indicated, the screening measures listed are used with all students, while the remaining identification measures represent the multiple criteria for which data may be collected, thus creating a student profile. Refer to Table B2 for a more detailed description of the procedure, along with specific measures, used for identification in each district.

Table B1

Gifted Identification Measures Outlined in Local Plans for the Education of the Gifted in Participating Districts

Measures	District							
	A[a]	B[a]	C[a]	D	E	F	G	H
Universal screening at grade 2 with Naglieri Nonverbal Ability Test (NNAT)	X	X	X					
Student products, performance, or portfolio	X	X	X	X	X	X	X	X
Observation of in-class behavior	X	X	X	X	X	X	X	X
Rating scales, checklists, or questionnaires	X	X	X	X	X	X	X	X
Nationally norm-referenced achievement test	X	X	X	X	X	X	X	X
Nationally norm-referenced aptitude test	X	X	X	X	X	X	X	X

Record of previous achievement	X	X	X	X	X		X	X
Individual student interview	X			X	X	X	X	X
Other measures					X[b]	X[c]		X[d]

[a] Treatment district.
[b] District E also uses the Brigance tests and Scale Achievement tests, if needed, along with out-of-grade testing.
[c] District F also uses state standardized test results, PALS Assessment, and ASSESS test.
[d] District H also uses state standardized test results and the PALS Assessment.

Table B2

Description of District Procedures for Gifted Identification in Local Plans for the Education of the Gifted

District	Procedure
A	Universal screening occurs in grades 2 using the gifted behaviors checklist and the NNAT2. Referrals can be made by teachers, family members, self, or others with knowledge of students' gifted potential. Data are collected using identification measures and are then reviewed by the Identification/Placement Committee.
B	Universal screening occurs in grade 1 using the NNAT, in addition to a review of standardized achievement test scores and student performance. Referrals can be made by school personnel, parents, self, peers, or community members. Data are collected from identification measures, including the students' most recent grades, and are then reviewed at the monthly division eligibility meeting. The Wechsler Abbreviated Scale of Intelligence or Woodcock-Johnson III NU are used for the nationally norm-referenced aptitude and achievement tests, and the Scales for Rating the Behavioral Characteristics of Superior Students are used for teacher rating scales. Students are found eligible if they meet the cutoff score using a matrix-based point system.
C	Universal screening occurs in grade 2 using the NNAT. Referrals may be made by parents, teachers, students, peers, self, professionals, or others. Data are collected from identification measures and are then reviewed by the placement committee, consisting of a classroom teacher, counselor, school psychologist, gifted site coordinator, and principal or designee. Data are entered into an Eligibility Matrix and students who meet a set cut-off score are deemed eligible for identification. Students who score below the cut-off may still be considered for identification.

D	Screening occurs continuously using results of state standardized assessments, teacher and parent input, and PALS assessment scores. Referrals may be made by classroom teachers, instructional staff, parents, students, and self. Data are collected from identification measures and are used to create a student file. A placement committee consisting of a classroom teacher, counselor, principal or designee, and gifted education coordinator reviews the following information to determine eligibility: ability and academic achievement test results, teacher and parent checklists, and classroom observation and performance results. Ability tests include the K-Bit, C-Toni 2, WIAT III, and WISC IV, while achievement tests include SAGES and SCALE.
E	Screening occurs continuously using results from the Measurement of Academic Progress (MAP), Slosson Reading Test, and Kingore Observation Inventory, in addition to data from classroom assessments and observation of student performance. Referrals may be made by parents, teachers, students, peers, self, professionals, or others. A placement committee consisting of a classroom teacher, gifted education resource teacher, counselor, gifted education coordinator, and principal or designee review the data. The ability test used may be the OLSAT, while the achievement test options include SAGES-2. To be identified for General Intellectual Aptitude, students must have a majority of scores in the range of the 96th percentile.
F	Screening occurs using the PALS Assessment, ASSESS Test, SAGES-2, Teacher Assessment Rating Scale, and overall academic performance. Referrals may be made by parents, teachers, students, peers, self, professionals, or others. Data are collected using the identification measures and are reviewed by a placement committee, consisting of a classroom teacher, counselor, administrator, and school gifted coordinator. Students may be identified for General Intellectual Aptitude if they score in the 93rd percentile of age norms or higher in one or more discipline. Ability tests may include the Otis-Lennon Ability Test, while achievement tests may include SAGES or the Woodcock-Johnson.
G	Referrals may be made by teachers, instructional staff, parents, students, and self. Data are collected using identification measures and are reviewed by the placement committee, consisting of a classroom teacher, gifted resource teacher, and principal or designee. Ability tests include the CogAT. Rating scales may be completed by both the teacher and parent. The Slosson test is also administered.
H	Screening is continuous throughout the year and relies on test scores, classwork, and observation, and include results from the Kingore Observation Inventory System. Referrals may be made by teachers, parents, and students. Data are collected from the identification measures and are reviewed as a holistic case study by the placement committee, consisting of the classroom teacher, gifted coordinator, principal or designee, and counselor. Students must score highly or have potentially high performance in verbal and non-verbal areas. Achievement

	tests may include SAGES. A behavior checklist is completed by both the teacher and the parent(s).

Appendix C

Descriptive Statistics of Sample

The final sample for the study consisted of 180 students distributed among three treatment districts and five control districts. There were 82 students in treatment districts and 98 in control districts. The pre-intervention measures for the present study assessed prior achievement (using the Iowa Assessments), motivation (using the Motivation subscale from the SRBCSS), self-efficacy, mindset, and stereotype threat. All measures were administered to students in both the treatment and control districts. A subset of the sample (N = 135) had no missing data points on any of the pre-intervention measures and were, therefore, considered complete observations while the remaining participants (N = 45) were missing at least one data point and were consequently considered incomplete observations. Refer to Table C1 for descriptive information, including means and standard deviations for each pre-intervention and post-intervention measure, regarding the subset of the sample with complete observations. Additionally, Table C1 contains district-level demographic and academic performance data averaged across the districts in each condition.

In order to compare the two subsets of participants, those with no missing pre-intervention data and those with missing observations on at least one pre-intervention measure, refer to Table C2, in which summary statistics are shown on certain covariates and the folklore posttest for each of the two subsets of students. Finally, for a baseline comparison of students with posttest data to those without posttest data, refer to Table C3.

Table C1

Descriptive Statistics of Sample

	Treatment	Control
Student-Level Characteristics		
N	66	69
Number of districts	3	5
Average age in years[a]	7.88 (.57)	7.97 (.38)
% Male	42.42	55.07
Prior Achievement	64.58 (19.37)	81.64 (18.69)
Motivation	57.05 (7.09)	56.88 (8.76)
Self-Efficacy	3.80 (.83)	4.14 (.71)
Mindset	3.91 (.82)	3.94 (1.11)
Stereotype Threat	2.87 (.90)	2.87 (.74)
Folklore Posttest	20.93 (8.39)	21.00 (8.67)
District-Level Characteristics[b]		
Full-Time Students	3356 (1952.29)[c]	3333.6 (1658.16)
% FRPL[d] Eligibility	61.58 (8.40)	59.1 (8.09)
% White	60.13 (27.73)	94.53 (3.43)
% African American	26.45 (21.09)	1.56 (1.12)
% Hispanic	10.06 (10.54)	2.18 (2.50)
% Asian	.45 (.53)	.25 (.25)
% American Indian	.14 (.02)	.11 (.06)
% Native Hawaiian/Pacific Islander	.08 (.01)	.05 (.05)
% Two or more races	2.69 (2.38)	1.32 (.82)
SOL[e] Grade 3 Reading Pass Rate (2016-2017)	69.0 (5.0)	74.2 (7.46)

SOL Grade 3 Reading Advanced Pass Rate (2016-2017)	12.0 (2.0)	14.4 (1.67)

Note: Standard deviations in parentheses.
[a] Age calculated at beginning of third-grade school year (September) for participants in Cohort 2.
[b] Data reported by the Virginia Department of Education (2016a; 2016b; 2017).
[c] Number of full-time students ranged from 1,364 to 5,266 in the treatment districts and ranged from 1,644 to 5,969 in the control districts.
[d] Free or reduced price lunch.
[e] Standards of Learning.

Table C2

Comparison on Measures Between Observations with Complete and Incomplete Covariate Data

	Complete	Incomplete
Prior Achievement	73.30 (20.80)	62.77 (24.27)
Motivation	56.96 (7.95)	57.41 (8.79)
Self-Efficacy	3.97 (.79)	4.04 (.71)
Mindset	3.92 (.98)	3.60 (1.03)
Stereotype Threat	2.87 (.82)	3.06 (.86)
Folklore Posttest	23.79 (3.81)	22.92 (4.28)

Table C3

Attrition Analysis on Baseline Measures

	Non-Attrited Cases		Attrited Cases	
	Treatment	Control	Treatment	Control
Prior Achievement	64.34 (19.65)	80.64 (18.62)	59.56 (25.90)	65.29 (27.65)
Motivation	57.00 (7.14)	57.82 (8.79)	54.33 (7.98)	54.64 (8.62)
Self-Efficacy	3.80 (.88)	4.18 (.65)	3.86 (.68)	3.86 (.66)
Mindset	3.86 (.84)	3.94 (1.03)	4.24 (1.02)	3.17 (1.25)
Stereotype Threat	2.95 (.88)	2.91 (.73)	3.07 (1.35)	2.47 (.57)

Note: Attrition analysis for observations with no outcome (folklore posttest) score.

Appendix D

Conceptual Model of Regression Models and Results

Figure D1 represents a conceptual model of the various covariates and the interaction terms tested in the present study. Figure D2 represents the interpretations of the statistically significant covariates in the final model selected.

Figure D1

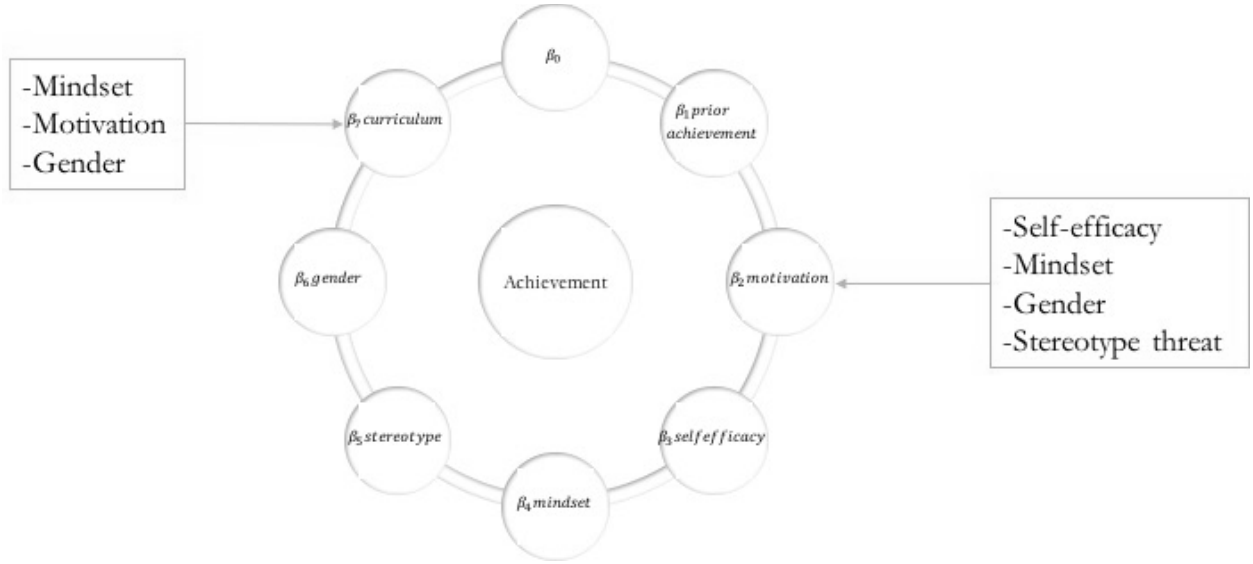
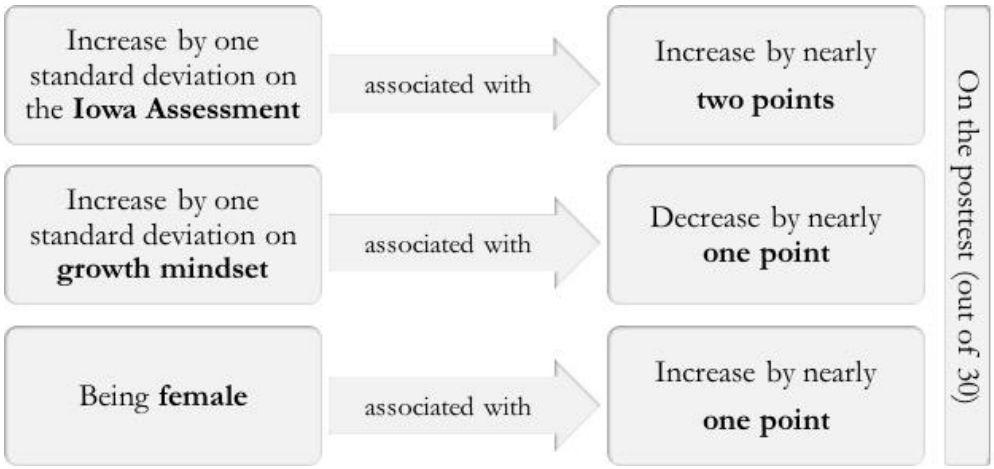


Figure D2



Appendix E

Descriptive Statistics of Measures

The pre-intervention measures for the present study assessed prior achievement (using the Iowa Assessments), motivation (using the Motivation subscale from the SRBCSS), self-efficacy, mindset, and stereotype threat. All measures were administered to students in both the treatment and control districts. Correlations among the measures for the subset of students for whom there were no missing data points on the pre-intervention measures can be found in Table E1.

Table E1

Correlations Between Pre-Intervention Measures

	1	2	3	4	5
1. Prior Achievement	–				
2. Motivation	.35***	–			
3. Self-Efficacy	.35***	.00	–		
4. Mindset	.31***	.17*	.12	–	
5. Stereotype Threat	-.03	-.01	-.14	.10	–

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

Appendix F

Regression Results

Table F1 presents the results of the regression of literacy achievement on the standardized pre-intervention measures of prior achievement, motivation, self-efficacy, mindset, and gender stereotype threat vulnerability, as well as gender and exposure to the CLEAR Curriculum folklore unit. The regression results in Table F1 are reported using Huber-White robust standard errors. Refer to Table F2 to compare the standard errors when using Huber-White robust standard errors with the standard errors when clustering at the school level in both Model 1 (the main effects model) and Model 2 (the final model chosen). Note that there were four observations with missing school identification data and the resulting clustered standard errors were similar to those yielded by the robust standard errors. Refer to Table F3 for the results of the regression analyses on the standardized pre-intervention measures and interaction terms.

Table F1

Regression of Literacy Achievement on Standardized Pre-Intervention Measures

	Model 1	Model 2	Model 3	Model 4
Prior Achievement	2.06***	2.23***	2.19***	2.00***
	(.37)	(.35)	(.36)	(.37)
Motivation	.28			
	(.27)			
Self-Efficacy	.14			
	(.21)			
Growth Mindset	-.89***	-.90***	-.93***	
	(.31)	(.30)	(.31)	
Gender Stereotype Threat Vulnerability	-.16 (.29)			
Female	.82*	.87*		
	(.46)	(.45)		
Curriculum	.44	.51	.38	.38
	(.79)	(.76)	(.71)	(.74)
Constant	22.92***	22.91***	23.36***	23.41***

	(.67)	(.66)	(.58)	(.64)
Indicators for District[a]	X	X	X	X
Indicators for Missing[b]	X	X	X	X
N	180	180	180	180
R^2	.88	.88	.88	.87
RMSE	3.11	3.10	3.11	3.19
BIC	993.97	980.47	973.81	974.14
p value	.00	.00	.00	.00

Note: Huber-White robust standard errors in parentheses.
[a]Dummy indicators for each district. "X" indicates presence in model.
[b]Binary indicators (present/missing) for each covariate. "X" indicates presence in model.
* $p < .10$
** $p < .05$
*** $p < .01$

Table F2
Comparison of Robust Standard Errors and Clustered Standard Errors in the Additive Regression Models

	Model 1 (R)	Model 1 (C)	Model 2 (R)	Model 2 (C)
Prior Achievement	2.06***	2.04***	2.23***	2.22***
	(.37)	(.38)	(.35)	(.40)
Motivation	.28	.30		
	(.27)	(.31)		
Self-Efficacy	.14	.15		
	(.21)	(.22)		
Growth Mindset	-.89***	-.89***	-.90***	-.90***
	(.31)	(.25)	(.30)	(.24)
Gender Stereotype	-.16	-.14		
Threat Vulnerability	(.29)	(.27)		
Female	.82*	.82	.87*	.87*
	(.46)	(.50)	(.45)	(.48)
Curriculum	.44	.52	.51	.56
	(.79)	(.84)	(.76)	(.77)
Constant	22.92***	22.93***	22.91***	22.93***

	(.67)	(.54)	(.66)	(.50)
Indicators for District[a]	X	X	X	X
Indicators for Missing[b]	X	X	X	X
N	180	176	180	176
R^2	.88	.88	.88	.88
RMSE	3.11	3.13	3.10	3.12
BIC	993.97	964.67	980.47	951.25
p value	.00	__[c]	.00	__[c]

Note: Huber-White robust standard errors in parentheses for (R) and clustered standard errors by school in parentheses for (C).
[a]Dummy indicators for each district. "X" indicates presence in model.
[b]Binary indicators (present/missing) for each covariate. "X" indicates presence in model.
[c]Overall p-values not reported due to the presence of multiple singleton dummies introduced by regressing with clustered standard errors.
* $p < .10$
** $p < .05$
*** $p < .01$

Table F3

Regression of Literacy Achievement on Standardized Pre-Intervention Measures and Interaction Terms

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Prior Achievement	2.20***	2.12***	2.27***	2.01***	2.06***	2.14***	2.06***
	(.36)	(.37)	(.36)	(.38)	(.38)	(.36)	(.38)
Motivation		.37		.39	.36	.46	.34
		(.31)		(.27)	(.28)	(.34)	(.30)
Self-Efficacy				.17			
				(.21)			
Growth Mindset	-1.01***	-.89***	-.91***	-.92***	-.88***	-.89***	-.86***
	(.32)	(.30)	(.30)	(.30)	(.30)	(.30)	(.30)
Gender Stereotype Threat Vulnerability							-.11 (.32)
Female	.00	.85*	.34	.83*	.88*	.88*	.88*
	(.00)	(.46)	(.71)	(.45)	(.45)	(.45)	(.47)

Curriculum	.17	.17	.61	.36	.28	.17	.14
	(.72)	(.74)	(.94)	(.74)	(.74)	(.75)	(.70)
Curriculum x Growth Mindset	.19						
	(.50)						
Curriculum x Motivation		-.24					
		(.33)					
Curriculum x Female							
Control x Female			1.00				
			(1.02)				
Motivation x Self-Efficacy				.07			
				(.05)			
Motivation x Growth Mindset					.11		
					(.10)		
Motivation x Female						-.41	
						(.52)	
Motivation x Gender Stereotype Threat Vulnerability							.07
							(.08)
Constant	23.62***	23.23***	23.08***	23.28***	23.28***	23.27***	23.33***
	(.59)	(.63)	(.70)	(.64)	(.63)	(.63)	(.62)
Indicators for District[a]	X	X	X	X	X	X	X
Indicators for Missing[b]	X	X	X	X	X	X	X
N	180	180	179[c]	180	180	180	180
R^2	.88	.88	.88	.89	.88	.88	.88
RMSE	3.13	3.11	3.11	3.10	3.10	3.11	3.11
BIC	983.75	989.35	980.26	992.94	988.77	989.15	993.61
p value	.00	.00	.00	.00	.00	.00	.00

Note: Huber-White robust standard errors in parentheses.
[a]Dummy indicators for each district. "X" indicates presence in model.
[b]Binary indicators (present/missing) for each covariate. "X" indicates presence in model.

[c]One observation was dropped from the analysis in Model 3 due to its status as a singleton indicator: it was the only observation for which the student was in the control group with missing data for gender.

[*] $p < .10$

[**] $p < .05$

[***] $p < .01$