Socioemotional Competencies, Cognitive Ability, and Achievement in Gifted Students

by

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ABSTRACT

This study examined the relations between cognitive ability, socioemotional competency (SEC), and achievement in gifted children. Data were collected on children between the ages of 8 and 15 years (n = 124). Children were assessed via teacher reports of SEC, standardized cognitive assessment, and standardized achievement assessment. Composite achievement significantly correlated with all areas of SEC on the Devereux Student Strengths Assessment (DESSA). Cognitive ability significantly correlated with all areas of SEC as well. Composite cognitive ability significantly correlated with all composite achievement, as well as with achievement in all subject areas assessed. Achievement scores tended to be higher in older age groups in comparison to younger age groups. When gender differences were found (in some areas of SEC and in language achievement), they tended to be higher in females. Gender moderated the relation between SEC and composite achievement. The areas of SEC that best predicted achievement, over-and-above other SEC scales, were Optimistic Thinking, Self-Awareness, and Relationship Skills. While cognitive scores did not significantly predict achievement when controlling for SEC, SEC did significantly predict achievement over-and-above cognitive ability scores. Overall findings suggest that SEC may be important in children's school achievement; thus it is important for schools and families to promote the development of SEC in gifted children, especially in the areas of optimism and self-awareness.

DEDICATION

This dissertation is dedicated to my family, who has shown me support always, even when they scratched their heads at me pursuing an advanced degree in Psychology. Also, to Kyle, who has shown me love and laughter beyond what I ever could have expected.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Within the past 10 years, elementary and secondary schools have had an increasingly strong focus on academic learning, achievement, and test scores. As a result, schools are generally less focused on the holistic and social-emotional development of students (National Research Council and Institute of Medicine, 2009). This may be attributed in part to the federal No Child Left Behind (NCLB) act, enacted in 2002, which required measurable student progress and achievement, so many schools shifted their concentration to preparing students for high-stakes academic testing (Zins, Weissberg, Wang, & Walberg, 2004). However, some researchers believe that the primary purpose of public schools is "preparing students to become knowledgeable, responsible, and caring citizens" (Zins et al., 2004, p. 25). This extends beyond students learning facts and being able to perform well on examinations – it implies that emotional and especially social development should be more of an imperative within the schools. Indeed, it has become recognized that social-emotional competence is extremely important for children's adjustment into adulthood (Merrell & Gueldner, 2010). In 2000, the U.S. Public Health Service declared that ''Mental health is a critical component of children's learning and general health. Fostering social and emotional health in children as a part of healthy child development must therefore be a national priority'' (p. 3).

Social-emotional development has been studied within many contexts. For instance, many researchers have studied aspects of social and emotional development in isolation, such as peer relations (Rubin, Bukowski & Parker, 2006)

or the ability to regulate one's emotions (Eisenberg et al., 1997). However, many social-emotional skills can be viewed as social-emotional competencies or strengths that together help promote resilience. Resilience has been defined as achieving positive outcomes while avoiding negative ones, despite adverse conditions (Wyman et al., 1999). Essentially, "a resilient child beats the odds for negative outcomes," (Neihart, Reis, Robinson, & Moon, 2002, p. 114). In fact, much research has been done on promoting resilience and social-emotional development, by creating and implementing intervention programs on social and emotional learning (SEL; Elias et al., 1997). SEL seeks to use classroom instruction and learning, "[building] children's skills to recognize and manage their emotions, appreciate the perspectives of others, establish positive goals, make responsible decisions, and handle interpersonal situations effectively" (Greenberg et al., 2003, p. 468). Some researchers (e.g., Zins et al., 2004) within the field have identified five person-centered SEL competencies: *self awareness*, which includes accurate self-perceptions of cognitions and emotions, recognizing strengths and values, and having a sense of self-efficacy; *social awareness*, or effectively relating to others including the ability to take others' perspectives and have empathy for them; *responsible decision making*, which refers to the ability to identify problems, evaluate situations, and use problem-solving skills; *self-management*, or self-regulation skills and the ability to control impulses, manage stress, motivate oneself, and take action towards goals; and *relationship management*, characterized by the ability to achieve satisfactory interpersonal relationships by communicating, cooperating, and utilizing support.

Many of these social-emotional competencies are not always directly addressed within school curriculum.

This study sought to research the social-emotional competencies of children who have been identified as gifted. While there is not complete agreement within the gifted literature on a definition of giftedness, one widely accepted version is from the National Association of Gifted Children (NAGC: 2010). The association defines giftedness as having exceptional aptitude (or ability to reason and learn) or competence (seen by performance or achievement in the top 10%). Individuals may have high aptitude or competence in one or more domains such as activities with symbol systems (e.g., mathematics, language arts, or music) or sensorimotor skills (e.g., dance, sports, or painting). The NAGC states that giftedness and talent are fluid concepts and that a spectrum of abilities needs to be considered. Thus, this conceptualization of giftedness is very broad in nature.

While other definitions of giftedness may also encompass many areas of ability, they also differentiate between the terms "gifted" and "talented." In 1997, Francois Gagné stated that gifted individuals possess untrained, natural abilities that are called aptitudes or gifts. These may be in different domains such as intellectual, creative, and social-emotional abilities. This is in contrast to talents, which refer to developed abilities and knowledge in a specific area. Similarly, recent researchers have distinguished gifted students, who achieve high scores on reliable and valid measures of ability, from talented students, who achieve high scores in an academic or performance-based area (Naglieri, Brulles, & Lansdowne, 2008).

Social and Emotional Development of Gifted Students

Due to the fact that researchers vary in their definitions of giftedness, the literature on the gifted population is not as clearly delineated as one might hope. In the realm of social-emotional development, gifted students have been found to have high self-concepts and to be highly motivated, well-adjusted, socially mature, and independent (Neihart et al., 2002). However other research suggests that gifted children are vulnerable to social and emotional difficulties, especially in the case of certain subpopulations such as those with a low socioeconomic, single parent, or African American background (Ford, 1996; Moon, Zentall, Grskovic, Hall, & Stormont-Spurgin, 2001).

Gifted students' social adjustment may vary depending on the level of giftedness. For instance, early research by Hollingworth (1926; 1942) found that children with intellectual ability scores between 125 and 155 were within the "optimal" range for confidence and friendship. However, she noted that children with ability scores above 160 were unlikely to find peers who were similar in interests and abilities and therefore felt more socially isolated. Hollingworth indicated that this was especially true for younger children (i.e., students five to nine years of age). More recently, gifted children have been described as falling into different classifications, such as exceptionally gifted (with a standard ability score between 160-179) and profoundly gifted (with an ability score equal to or above 180). Janos and Robinson (1985) found that children who were the most highly talented were the most vulnerable to peer relation difficulties because they were "out of sync" with school friends and family (p. 182), which is congruent with

Hollingworth's early findings. Additionally, in 1993, Gross found that of exceptionally and profoundly gifted children (with ability scores 160+), 80% reported experiencing social isolation within the regular education classroom. In a recent study, however, Perham (2012) found that gifted students with higher cognitive ability tended to have slightly higher interpersonal skills in comparison to moderately gifted students.

Social and emotional development by gender. Gifted students' social and emotional development may also be affected by gender. When considering the general population of children and adolescents, females have been found to adjust better to social situations and display more prosocial behavior when compared to male peers (Masten, Juvonen, & Spatzier, 2009). In comparison to boys, girls also are more likely to be sensitive to the distress of others, more likely to seek support, and tend to express emotions more (Rose & Rudolph, 2006). In the gifted population, a similar trend has been discovered; gifted girls more frequently display prosocial behavior, have less negative social behavior, and demonstrate overall higher social-emotional competence (D'Ilio & Karnes, 1987; Helt, 2008). A study by Luftig and Nichols (1990) examined the social rankings of students. The researchers compared the popularity of different types of students and found that gifted boys ranked as most popular, nongifted boys and nongifted girls ranked second most popular, and gifted girls ranked least popular of the four groups. The researchers postulated that boys might attempt to hide or mask their giftedness through different behaviors such as being funny in class. In terms of emotional development, some research has shown that

gifted males may experience more depression than gifted females (Bartell & Reynolds, 1988; Kline & Short, 1992).

Positive Traits in Gifted Students

Gifted students may also differ from nongifted peers in their motivation and attitudes surrounding learning. Researchers have found that gifted students tend to focus on mastery strategies and be more intrinsically motivated (Gottfried & Gottfried, 1996; Gross, 1997). They are also more likely to enjoy learning and approaching challenges (Gottfried, Gottfried, Bathurst, & Guerin, 1994).

Additionally, research has shown that gifted children tend to be more resilient than their nongifted counterparts (Neihart et al., 2002). In fact, they tend to share many traits with children who are considered resilient. For instance, they tend to have self-efficacy (Masten & Garmenzy, 1990), curiosity (Garmenzy & Rutter, 1983), and problem-solving skills (Masten & Garmenzy). These traits may serve as developmental assets (Neihart et al.). It has also been postulated that gifted children may experience additional perceived stressors compared to nongifted students, such as confusion, embarrassment, or guilt (Baker, 1996; Ford, 1989); however, gifted children may have better coping strategies that enable them handle these stressors and therefore be more resilient. These skills can result in positive emotional development (Bland, Sowa, & Callahan, 1994).

Social-Emotional Competence and Achievement

The current study looked at the relation between children's social-emotional competencies and achievement. According to Zins and colleagues (2004), this is a relatively new field, with the first study of this relation published by Hawkins in

1997. Subsequent studies of social-emotional learning intervention programs have varied in how they measure academic achievement outcomes, and some studies have not directly addressed achievement outcomes. Zins and colleagues (2004) stated that there is currently no strong evidence to support the relation between emotional development and academic achievement. Catalano, Berglund, Ryan, Lonczak, & Hawkins (2002), however, reviewed multiple SEL programs and outcomes to document connections between social and emotional development and academic achievement performance. They found that the effective youth SEL programs addressed a range of objectives, but all sought to strengthen social and emotional competencies and self-efficacy. They found that the prevention programs addressed positive development including improving academic performance and reducing the risk of academic failure (Catalano et al., 2002).

As stated previously, research studies have measured achievement in a variety of ways. Thus, there does not currently appear to be an agreed-upon measure of achievement within the field. Some researchers state that the broad concept of school success should be considered (Elias, Wang, Weissberg, Zins, & Walberg, 2002), rather than just test scores. School success is conceptualized as including multiple components – *school attitude*, *school behavior*, as well as *school performance* (Zins et al., 2004). *School attitudes* can include students' motivation and feelings of attachment to school. *School behavior*, on the other hand, refers to many outcomes, such as students' attendance, engagement, and study habits. *School performance* aligns with commonly viewed definitions of academic achievement,

such as subject mastery, grades, or scores on standardized tests. Thus, school success and achievement can be viewed as complex and multi-faceted.

A recent meta-analysis by Durlak and colleagues (2011) provides evidence that social-emotional competence relates to important student outcomes including academic achievement. The study included universal school-based SEL programs, and their review included over 200 studies and 250,000 students. The results of the meta-analysis revealed that, following the implementation of SEL programs, students demonstrated fewer conduct problems and less emotional distress (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). They tended to demonstrate more prosocial behaviors, better SEL competencies, and an improved attitude towards academics. Remarkably, there was also a significant improvement in students' post-intervention school achievement, as measured by standardized mathematics and reading tests (e.g., the Stanford Achievement Test or the Iowa Test of Basic Skills), and school grades (e.g., grades in specific subjects or students' overall GPA). The study found a small, but significant, effect size of 0.27, which the researchers equated to an 11-percentile gain in achievement following the SEL programs compared to the control group (Durlak et al., 2011). Other studies have found an increase of up to 17 percentile points in academic performance following SEL interventions (Payton et al., 2008). Durlak and colleagues noted that their results are comparable to meta-analyses of other educational interventions, strictly focused on academics (Hill, Bloom, Black, & Lipsey, 2007). A study by Ball of the Devereux Center for Resilient Children (2009) also found significant positive correlations between academic achievement on the TerraNova group achievement

test and social-emotional competencies as measured by the Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009).

Early social-emotional development and academic performance. Other studies have looked at early social and emotional competence and its relation to academic performance. For instance, Caprara and colleagues found that early prosocial behavior strongly predicted later academic achievement, even when controlling for earlier academic achievement (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000). While this study was conducted in Italy, it was noted that studies have found similar results in many countries, including the United States (e.g., Wentzel, 1993). Additionally, Merrell and Gueldner (2010) stated that a link between emotion regulation and academic performance has been well established in younger children (see Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). In a longitudinal study, Welsch, Parke, Widaman, & O'Neil (2001) found a reciprocal relationship between social competence (measured by prosocial and aggressive behaviors) and academic achievement (e.g., grades) – not only did social competence positively relate to later academic achievement, but early academic achievement also related to later social competence in second and third grades. In studying SEL programs, Durlak and colleagues' (2011) meta-analysis found that students' mean age was significantly and negatively related to their academic skill outcomes. However, this study went on to conclude that SEL programs are successful at all educational levels, from elementary to high school.

Relations between social-emotional competence and achievement. The relation between social and emotional competence and achievement may be quite

complex. Compelling arguments, based on empirical findings, have been made to conceptualize the relation (Zins et al., 2004). Information on the relation between social and emotional competence and achievement also derives from the study of children who lack these competencies. SEL has been described as an "enabling component" that helps promote school success and allows students to overcome barriers to their learning and development (Adelman & Taylor, 2000; Zins et al.) For instance, students who have better metacognition (awareness of their capabilities) and self-efficacy (confidence in their capabilities) tend to try harder, persisting when posed with challenges (Aronson, 2002). A number of other skills and activities can contribute to students learning more and obtaining better grades: setting academic goals, using self-discipline, motivating themselves, managing stress, and organizing an efficient work approach (Duckworth & Seligman, 2005; Elliot & Dweck, 2005). Additionally, it has been found that students perform better academically when they are able to use problem-solving skills to overcome obstacles and make responsible decisions regarding studying and completing homework (Zins & Elias, 2006).

It is postulated that children who perform better academically have more positive social and environmental assets (Payton et al., 2008). For instance, bonds to prosocial peers and social-emotional adaptation have been found to positively contribute to students' motivation for learning (Zins et al., 2004). Peers can influence a child's school success in a number of ways – they model skills, assist in problem-solving, serve as resources, and provide support (Schunk & Hanson, 1985).

A child's attachment towards school may also be a mediator in the relation between social-emotional competence and achievement (Payton et al.).

It is also hypothesized that emotion regulation skills are imperative for academic success. According to Blair (2002), who researched the integration of cognition and emotion, necessary cognitive processes for school include sustaining attention, memory, and planning. Merrell and Gueldner (2010), therefore, indicated "poor emotion regulation interferes with the very cognitive processes that are needed to attend to instruction, remember key concepts, and plan to complete homework." Emotion regulation may also affect the development of intrinsic motivation in the face of challenges, which may impact long-term engagement in studying and intellectual pursuits (Zins et al., 2004).

Another way in which emotion regulation may contribute to academic success is that it may lead to less inappropriate classroom behavior. Students who lack competence in regulating their emotions can have difficulties managing behaviors, which may lead to problems paying attention and completing academic tasks (Merrell & Gueldner, 2010). In contrast, students with better social and emotional competency in the area of self-management and self-regulation may be better able to control emotional outbursts and impulsive reactions in class; this may allow them to sit through class, interact appropriately with others (Zins et al., 2004), and engage in the coursework. Students with good emotion regulation may also be able to avoid risky behaviors that can interfere with school performance, such as substance use, premarital sex, and violence (Payton et al., 2008).

Relations between social-emotional competence and achievement in gifted students. The aforementioned studies of children's social and emotional competence in relation to school success were frequently focused on the general student population or on children deemed academically or socially at-risk, and not on the current study's population: gifted children. Despite a lack of empirical evidence in the relation between gifted children's social-emotional competency and achievement, some hypotheses may be drawn based on current research with the gifted population. These students tend to have some stronger specific social and emotional competencies which educational psychology research has found to be related to higher achievement (Aronson, 2002).

As stated previously, children who are gifted tend to have high self-efficacy or judgments of confidence in their abilities (Masten & Garmenzy, 1990). They also tend to have positive self-concepts or judgments relating to one's self-worth (Chamrad, Robinson, Treder, & Janos, 1995). Self-efficacy and self-concept, according to Aronson (2002), clearly influence motivation and academic achievement. Gifted children also tend to be more accurate in predicting their academic performance (Pajares, 1996); this relates to metacognitive skills and self-efficacy, both of which are closely tied to better learning and achievement (Bandura, Barbaranelli, Vittorio Caprara, & Pastorelli, 1996; Hofer & Pintrich, 2002). Self-efficacy was also found to be better developed in highly achieving gifted youth when compared to underachieving gifted children (Neihart et al., 2002).

Additionally, teaching children self-regulation may contribute to better interpersonal functioning and academic performance (Greenberg & Kusché, 1993).

Self-regulation includes skills such as setting realistic goals and using appropriate strategies; it has been found in highly achieving gifted students more frequently than in underachievers (Neihart et al., 2002). Moreover, highly achieving gifted children tend to have a stronger goal orientation and tend to find school meaningful, enjoyable, and beneficial (Neihart et al.).

Children who are gifted may also have better social development than same age non-gifted peers. Researchers have found that social development may be more consistent with mental age than with chronological age (Janos & Robinson, 1985; Karnes & Oehler-Stinnett, 1986), and they argue that the ability to reason and think abstractly leads to social and emotional development. Young gifted children are sometimes more popular than typical peers and tend to be well-liked (Schneider, Clegg, Bryne, Ledingham, & Crombie, 1989; Udvari & Rubin, 1996), which may suggest that young gifted children have strong social and emotional competencies. For example, gifted children tend to learn empathy at an early age and can be sensitive to the needs of others (Roeper, 1982; Roeper & Silverman, 2009). Also, gifted achievers have been found to participate in multiple activities and have a support system consisting of other achieving peers (Reis, 1995); the social support for these gifted students may help them to achieve in school. Although exceptionally gifted students can feel socially rejected with same-age peers, these gifted children are often able to create fulfilling relationships with older children with similar mental ages (Gross, 1993).

Gender Differences in Achievement

Over time and across countries, there have been mixed findings regarding gender differences in achievement. Early research from 1984 found differences in the self-efficacy of boys and girls in different subjects (Eccles, 1984). In that study, boys were found to have higher self-efficacy in math and girls had higher self-efficacy in English and reading. In 1998, Marsh and Yeung found that despite female's higher self-concepts in reading ability and lower self-concepts in math, their standardized test scores were only slightly higher in reading and slightly lower in math than males.

Neihart et al. (2002) noted that girls tend to get better grades, but get lower scores on some standardized tests. This may be related to Dweck's (2000) finding that girls are more likely to hold an entity (sometimes referred to as fixed) view of their intelligence and therefore are more likely to take on a learned helplessness point of view.

More current research, however, notes that despite some differences in cognitive ability, the academic performance of boys and girls is more similar than different (Meece & Daniels, 2008). A cross-cultural study including children from the U.S. and different Asian cultures found that, overall, boys and girls seem to perform similarly in their math and reading performance (Lummis & Stevenson, 1990). Again, this was despite differences found in their cognitive ability (e.g., girls scored higher on auditory and verbal memory while boys scored higher on spatial relations and general information tasks). It appeared that boys were better at applying some math concepts, but basic math and reading were similar across

genders. In congruence with this, a meta-analysis by Hyde and Linn (1988) showed that the stereotypical differences in verbal ability scores no longer existed.

Gender differences in achievement in gifted students. It is noted that the aforementioned studies on the relation between gender and achievement are based on the general population of children, and may vary in the gifted population. Preckel and colleagues (2008) compared the gender differences in math performance for both average ability and gifted students in Germany. They found gender differences in math achievement, with males performing higher on standardized test scores. However, similar academic grades were found across genders. Boys were also noted to have higher interests and self-concepts in math. Overall, the gender differences found in the study were reported to be larger in the gifted sample than within the average-ability students (Preckel et al., 2008). Olszewski-Kubilius and Turner (2002) also found differences in gender performance on standardized tests. Gifted elementary school males outperformed females in math starting in grade three. They found that the students' perceptions of their academic strengths related to their actual test performance. In contrast, a review by Freeman (2003) concluded that the academic achievements of gifted girls in Britain have exceeded those of gifted boys. This same gender difference was not found in the U.S. in their study. This may have been due to differences in self-efficacy in the two countries, as well as differences in curriculum and assessment, which was stated to favor female study patterns.

Cognitive Ability and Achievement

Intelligence and cognitive ability have also been linked to student achievement (Petrides, Frederickson, & Furnham, 2004; Neisser, 1996; Newsome, Day, & Catano, 2000). In fact, one of the first intelligence tests, the Binet-Simon Scale, was originally created by Alfred Binet and Theodore Simon (1905) as a measure of a child's ability to succeed in school. The current relation between intelligence and achievement can be viewed as important because school psychologists often interpret performance on these types of assessments in relation to one another (Naglieri & Bornstein, 2003), with the thought that intelligence tests measure general reasoning skills that predict academic achievement (Parker & Benedict, 2002). Neisser (1996) conducted early research on this relation and found that intelligence tests predict school performance well, and the correlation between the two was about .50, with about 25% of the overall variance accounted for. A review by Brody (1997) noted that intelligence scores were correlated with grades in school, performance on tests of reading and math, tests of academic content, as well as outcomes in humanities, sciences, and social sciences. Intelligence as measured by the WISC-III was found to relate to future achievement, while the achievement scores did not influence or relate to later psychometric intelligence (Watkins, Lei, & Canivez, 2007). Gender does not appear to be a determining factor; a study by Fergusson (2005) found no significant gender interactions when examining the relation between intelligence scores and educational outcomes. In general, no gender differences tend to be found in overall intelligence scores (Brody, 1992).

Some researchers have contended that intelligence is causally related to achievement (Jensen, 2000). A longitudinal study also found that intelligence scores were associated with long-term educational success and degree attainment (Fergusson, 2005). Early intelligence scores have also been predictive of reading scores six years later (Butler, Marsh, Sheppard, & Sheppard, 1985). The predictive validities of various cognitive ability assessments for school achievement are discussed in technical manuals. For instance, on various verbal and nonverbal batteries (including the Cognitive Abilities Test [CogAT; Lohman & Hagen, 2002]), the predictive validities for tests of verbal and quantitative reasoning ranged from r =. 6 to r = .8, whereas unidimensional nonverbal tests varied from approximately r = .3 to r = .6 (Latkin & Lohman, 2011). Flanagan (2000) also found that on the Wechsler Intelligence Scale for Children-Third Edition (WISC-III; Wechsler, 1991), overall intelligence correlated with various achievement tests and accounted for approximately 41% of variance in reading achievement.

Some researchers postulate that intelligence or cognitive ability tests are correlated to achievement tests because they are similar, especially in the task demands (Petrides et al., 2004; Waterhouse, 2006). However, other studies continue to show some strong correlations between cognitive ability test scores and achievement tests scores, even when the cognitive tests did not contain achievement-like subtests (Naglieri & Bornstein, 2003).

Relations among Social-Emotional Development, Cognitive Ability, and Achievement

Multiple researchers examining the relations between social-emotional development, achievement, and cognitive ability studied emotional intelligence as a measure of social and emotional development. Mayer, Salovey, and Caruso (2000) proposed the following definition of Emotional Intelligence (EI):

> Emotional intelligence involves the capacity to reason with and about emotions, including (1) the ability to perceive accurately, appraise, and express emotions; (2) the ability to access and/or generate feelings when they facilitate thought; (3) the ability to understand emotion and emotional knowledge, and (4) the ability to regulate emotions to promote emotional and intellectual growth. (pp. 328–329)

However, more recent EI researchers have suggested that EI can be divided into trait (trait emotional, personality-related) and ability (cognitive-emotional ability) EI (Petrides & Furnham, 2001).

The question of which is more predictive of achievement – social and emotional development or intelligence scores – remains to be clarified. A meta-analysis of different variables and their effects on student outcomes by Wang, Heartel, & Walberg (1993), concluded that student characteristics – social, behavioral, motivation, affect, cognitive, and metacognitive – had the most impact on academic achievement. Some researchers, such as Petrides, Frederickson, and Furnham (2004), have examined relations among EI, cognitive ability, and academic performance. In their large-scale British study, they found that EI moderated the

relation between cognitive ability and academic performance. Other findings indicate that EI scores did not appear to provide any substantial predictive validity of achievement, especially over and above cognitive ability and personality measures (Barchard, 2003; Matthews, Zeidner, & Roberts, 2004; Newsome et al., 2000). In Barchard's (2003) study, EI predicted 8% of the variance in academic success, while cognitive ability explained 17% of the variance. However, in Newsome and colleagues' study (2000), EI scores did not significantly relate to academic achievement. Studies have found that self-discipline accounts for more variance than IQ in predicting students' final grades (Duckworth & Seligman, 2005). Due to inconclusive results regarding the relations between social-emotional development, cognitive ability, and academic achievement, it has been suggested that cognitive variables should be considered in the prediction of academic performance (Chamorro-Premuzic, & Furnam, 2005; Mavroveli, 2011; Valiente et al., 2011).

Relations among Social-Emotional Development, Cognitive Ability, and Achievement in Gifted Students

While there are few studies of social-emotional development and achievement in the gifted population, Petrides and colleagues (2004) studied these relations, as well as the effect of intelligence scores, with a range of students. In the general population, these researchers found that EI tended to facilitate improvements in academic performance. However, they found that EI did not have the same significant effect in students with high intelligence scores (i.e., IQ > 128.2). They concluded that EI may be a more prominent factor when intellectual resources

are not as readily available. The critical review by Waterhouse (2006) also noted that researchers' repeated findings of significant positive correlations between EI and intelligence were flawed because they failed to include participants with very high and very low intelligence scores.

Areas of Cognitive Ability and Achievement in Subject Areas

Different studies have found that performance on indices of cognitive ability tests may relate to students' performance on different sections of standardized achievement tests. Verbal ability appears to be particularly important in predicting achievement. For instance, Barchard (2003) found that only verbal ability had a significant correlation with academic success; this variable was a better predictor of academic success than EI. Also, Evans, Floyd, McGrew, and Leforgee (2002) found that crystallized intelligence (Gc), which is often associated with verbal and language ability, correlated with reading achievement (r = .43), while fluid intelligence (Gf) did not. Within a gifted sample of both English Language Learner (ELL) students and non-ELL students, Latkin & Lohman (2011) reported quantitative ability scores were most predictive of math achievement scores, and verbal ability scores were the most predictive of reading. Nonverbal scores were the least predictive of achievement in their study.

Research specific to the CogAT (Lohman & Hagen, 2001) has been conducted to determine the relations to achievement scores. Lohman and Korb (2006) found that reading in grade 9 was best predicted by grade 4 CogAT Verbal scores. Additionally, grade 9 math was best predicted by grade 4 quantitative scores. Latkin (2012) also studied the CogAT, and found the test batteries provided strong

predictive validity for achievement. The two-year study yielded results consistent with previous studies – reading scores were most strongly correlated with verbal ability scores, and math more strongly correlated with quantitative reasoning scores. Again, nonverbal scores had lower correlations with the achievement measures. This was found even in ELL students.

The aforementioned studies conducted by researchers Latkin and Lohman have received some criticism. Naglieri and Ford (2005) noted that it was likely that similar skills were needed to solve problems in verbal, quantitative, and achievement tests. "There is a theoretical blurring of the lines between tests of 'achievement' and 'ability' that is apparent in many widely used tests…" (Naglieri & Ford, 2005, p. 32). Thus, the psychometric advantage that the verbal and quantitative tests have over nonverbal tests in prediction of achievement is not due to a theoretical advantage, but it appears to be due to comparable task demands.

Research Questions

This study examined the relations between social-emotional (or socioemotional) competencies, cognitive ability, and achievement in gifted children, and there are a number of research questions and hypotheses that were posed.

Research Question 1a. Is there a relation between socioemotional competence and academic achievement?

Hypothesis 1a. It is hypothesized that students who exhibit better-developed socioemotional competence will demonstrate higher academic achievement on standardized achievement measures.

Research Question 1b. Are there relations between the different areas of socioemotional competence and academic achievement?

Hypothesis 1b. It is hypothesized that students with higher socioemotional competency scale scores will demonstrate higher academic achievement on standardized achievement measures.

Research Question 1c. Which areas of socioemotional competency will best predict achievement?

Hypothesis 1c. Based on achievement research, it is hypothesized Self-Awareness and Goal-Directed behavior would best predict achievement scores.

Research Question 2a. Will overall socioemotional competence vary by gender?

Hypothesis 2a. It is hypothesized that gifted girls, as compared to gifted boys, will demonstrate better-developed overall socioemotional competency.

Research Question 2b. Will gender moderate the relation between socioemotional competency and achievement?

Hypothesis 2b. It is hypothesized that the relation between overall socioemotional competence and achievement may vary by gender.

Research Question 3. Will academic achievement vary by gender?

Hypothesis 3. It is hypothesized that there will be no differences in overall academic achievement between male and female gifted students.

Research Question 4. Will age moderate the relation between socioemotional competence and academic achievement?

Hypothesis 4. It is hypothesized that the relation between overall socioemotional competence and achievement skills may vary by age, with a stronger relation found in younger children.

Research Question 5. Is there a relation between overall cognitive ability and achievement?

Hypothesis 5. It is hypothesized that overall cognitive ability will have a significant positive correlation with the standardized measure of achievement.

Research Question 6. How well will cognitive ability predict achievement over and above the socioemotional competence measures?

Hypothesis 6. It is hypothesized that cognitive ability will predict more incremental variance in achievement over and above socioemotional competence.

Research Question 7. How well will socioemotional competence predict achievement over and above the cognitive ability measures?

Hypothesis 7. It is hypothesized that socioemotional competence will not predict more incremental variance in achievement over and above cognitive ability in the gifted population.

Research Question 8. Will cognitive ability vary by gender?

Hypothesis 8. No differences in overall cognitive ability are hypothesized to be found between girls and boys.

Research Question 9. Will certain areas of cognitive ability more strongly relate to standardized academic achievement scores in different subject areas?

Hypothesis 9a. It is hypothesized that verbal ability scores will most strongly relate to reading achievement scores.

Hypothesis 9b. It is hypothesized that quantitative ability scores will most strongly relate to math achievement scores.

CHAPTER 2

METHODS

Participants

Participants were students attending a large (approximately 33,000 student) K-12 school district in the Southwestern United States who were receiving gifted education services. Data were collected on 276 elementary and middle school students (grades K-8), with students participating in three types of gifted education programming offered in the district. One program was a cluster grouping setting, in which students at each grade level are grouped into mixed-ability classrooms (Brulles, Saunders, & Cohn, 2010). A second type of gifted programming represented was content-replacement services, in which students receive accelerated and enrichment in mathematics and language arts with a gifted specialist. The third type of programming was self-contained classes; in these, highly and profoundly gifted students who are radically accelerated in their academics attend the same classroom for all subjects.

The students in the study were classified as gifted based on scores on cognitive ability assessments administered by the school district prior to the current study. Criteria set by Arizona state law requires cognitive performance on a verbal, quantitative, or nonverbal test within the 97th percentile or above for a student to be classified as gifted.

As the current study sought to examine the relations between cognitive ability, socioemotional competencies, and achievement, only gifted students with standard scores in these areas (on the Cognitive Abilities Test, Devereux Student

Strengths Assessment, and Stanford Achievement Test Series, Tenth Edition) were included in the final sample (n = 124). This final sample included students from second through eighth grade, as they were the grade levels that were administered the achievement test. The students' ages were based on their age at the time of the DESSA ratings, which occurred in the summer following their school year with the teacher.

The students in this final sample ranged from 8-15 years (M = 10.96, SD = 1.81), with more females than males in the gender distribution (75 females, 49 males). The sample consisted of children of the following races and ethnicities: 56% Caucasian, 14% Hispanic, 17% Asian, 10% two or more races, 2.4% African American, and 0% Native Hawaiian or other Pacific Islander. This was representative of the school district's gifted population; however, in comparison to the general population of the district, there was underrepresentation of Caucasian (67% in general district population), Hispanic (24%), African American (4%), and Native American students (1%), and there was an overrepresentation of Asian students (4%). Some students were identified as gifted by qualifying in one area only. Twenty percent of students (n = 25) in the final sample were identified as gifted solely based on scores on a nonverbal ability estimate, 23% (n = 29) were identified based on verbal ability scores, and 13% (n = 16) were identified solely based on a quantitative ability scores only. Other students in the sample were identified based on scores in more than one ability area (verbal and quantitative, n = 18, 15%; verbal and nonverbal, n = 14, 11%; quantitative and nonverbal, n = 12, 10%). The sample had 8% of students (n = 10) identified as gifted in all three ability

areas, based on their cognitive ability scores. Students in the district were identified as gifted based on scores on different cognitive ability measures, such as the Cognitive Abilities Test (CogAT; Lohman & Hagen, 2001), Stanford-Binet Intelligence Scales (SB5; Roid, 2003), Naglieri Nonverbal Ability Test (NNAT2; Naglieri, 2008), and Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003). However, due to the fact that CogAT scores were used to identify the majority of the gifted students in the district (approximately 75% of the students), only cognitive ability scores from this assessment were utilized in this study. Significant outlier scores on the achievement measures, based on frequency and stem-and-leaf boxplot examination, were removed from the sample; this reduced the sample by three participants.

Measures

Devereux Student Strengths Assessment. The Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009) is a 72-item standardized behavior rating scale measuring social-emotional competencies that serve as protective factors for children. The assessment is norm-referenced and strength-based – it inquires about positive and adaptive behaviors (e.g., getting along with others) rather than negative or maladaptive behaviors (e.g., bothering others). The DESSA was normed on children from kindergarten through grade eight. The rating form is designed to be completed by parents/guardians, teachers, school staff, and other child-serving agencies (e.g., social service or mental health).

The DESSA offers insight into eight areas of social-emotional competence: Self-Awareness (understanding strengths and desire for self-improvement), Social

Awareness (ability to interact with others and demonstrate cooperation and tolerance), Self-Management (controlling emotions to face challenging situations), Goal-Directed Behavior (initiation and persistence in completing tasks), Relationship Skills (promote and maintain positive relationships), Personal Responsibility (careful and reliable in actions contributing to group efforts), Decision Making (problem-solving approach using values, experience, and responsibility), and Optimistic Thinking (positive thinking and confidence regarding life situations)(LeBuffe, et al., 2009).

The DESSA items all begin with the same stem ("During the past four weeks, how often did the child…") and are followed by questions about the child's strength-based behavior (e.g., "keep trying when unsuccessful" or "speak about positive things.") Each item was rated using a 5-point Likert scale ranging from 0 to 4 (Never = 0, Rarely = 1, Occasionally = 2, Frequently = 3, Very Frequently = 4). The DESSA provides a total *T*-score ($M = 50$, $SD = 10$), as well as *T*-scores for eight social–emotional competence subscales; *T*-scores above 60 are considered strengths, and scores below 40 are considered areas in need of improvement. Percentile ranks are also reported. The eight scales combined form a composite score called the Social-Emotional Composite (SEC, sometimes called the Total Protective factor), which provides an overall indication of the strength of the child's social–emotional competence related to resilience.

The standardization sample for the DESSA consisted of 2,500 children from across the United States who were representative of the U.S. population in respect to gender, race, ethnicity, region and socioeconomic status (LeBuffe, et al., 2009).

Evidence has been established for the reliability of the DESSA (LeBuffe et al., 2009; Nickerson & Fishman, 2009). The internal consistency of the composite SEC score, as measured by alpha coefficients, was high for teachers/staff (α = .99). The internal consistency of the subscales ranged from .87 to .93. The total test-retest reliability coefficient with a 1-week interval was high for teachers/staff (.94). In addition, the test-retest reliability coefficients for the subscales ranged from .86 to .94 when teachers/staff ratings were considered (Lebuffe, et al., 2009; Nickerson & Fishman, 2009). The inter-rater reliabilities were also adequate, with a correlation coefficient of .735 for teachers/staff. Additional outside reviewers noted strong reliability on the DESSA, with intraclass correlations greater than 0.7 and high internal consistency (Tsang, Wong, & Lo, 2012).

In terms of validity, empirical support has been established for the DESSA. Nickerson and Fishman (2009) explored convergent validity of the DESSA with the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004). The DESSA strongly and significantly correlated with the adaptive composite on the BASC-2 (parents r = .77, teachers r = .92). The DESSA was also found to have divergent validity, and it was significantly, negatively correlated with the majority of the BASC-2 clinical subscales for both teacher and parent ratings.

Additionally, the DESSA publishers found that the DESSA was effective in differentiating between students with and without social, emotional, and behavioral challenges. DESSA scores were compared to students who had previously been

identified as having social, emotional, and behavioral disorders. In comparison to their non-identified peers, the DESSA scale showed significant mean score differences (*p* values <.01). There was a median effect size of .80, and the effect size for the SEC score was 1.31. The SEC score was able to correctly predict group membership of 70% of students with social, emotional, and behavioral disorders and 76% of the non-identified students. As the DESSA measures protective factors, high scores were found to be associated with significantly fewer behavioral problems for students.

The Stanford Achievement Test Series, Tenth Edition (Stanford 10). The Stanford 10 is a group-administered, standardized achievement test. It is an untimed, multiple-choice assessment developed to comprise a battery of 13 test levels that assess students from kindergarten to grade 12 (Pearson, 2004). Stanford 10 offers different subtests and composite tests such as Reading, Mathematics, Language, Social Studies, and Science. In this specific study, Stanford 10 was used to assess students in Reading, Mathematics, and Language. In each area, students are asked to demonstrate both basic understanding (e.g., recognize information) and thinking skills (e.g., analysis and synthesis).

Stanford 10 yields norm-referenced and criterion-referenced information. For instance, the assessment produces raw scores, scaled scores, individual percentile ranks, stanines, grade equivalents, and normal curve equivalents.

Stanford 10 was standardized in both the spring and fall of 2002, with 250,000 and 110,000 students, respectively. The standardization sample included children from across the United States who were representative of the U.S.

population in regards to region, economic status, urbanicity (i.e., urban, suburban, and rural), and ethnicity.

Internal consistency for Stanford 10 was measured using the Kuder-Richardson Formula 20 (KR20) to determine reliability coefficients. Sufficient evidence for internal consistency was found with KR20 coefficients between .85 and .96 for students between second grade and eighth grades on total reading, writing, and language scores. Additionally, reliability was measured using alternate forms with different, but equivalent test versions; adequate reliability was found in the equivalency of the forms, with coefficients ranging between .76 and .92 on total reading, writing, and language scores in students between 2nd and 8th grade.

In regards to the validity of Stanford 10, there is little independent empirical support for this edition of the achievement assessment. With previous versions of the Stanford Achievement Test (SAT), Salvia and Ysseldyke (1981) referred to the SAT as a model for test standardization procedures with adequate reliability and content validity. For the tenth edition, the publisher attempted to obtain content validity by consulting with content area specialists and test construction professionals to review and evaluate the test questions (Pearson, 2004). While the publisher reports concurrent, convergent validity with the Otis –Lennon School Ability Test, Eighth Edition (OLSAT 8), it is noted that the OLSAT 8 was intended to be a measure of ability level (i.e., similar to a cognitive assessment), not achievement. The intercorrelations between total reading, math, and language scores and the total OLSAT 8 scores ranged between .64 and .78.

Convergent validity was found in Karrh's (2009) study, which compared the Texas Assessment of Knowledge and Skills (TAKS; Texas Education Agency, 2007) to Stanford 10 results. The total reading score on Stanford 10 was significantly correlated to TAKS reading in seventh grade students ($r = .67$, $p < .01$). Similarly, math scores for the students in seventh grade were significantly correlated on Stanford 10 and the TAKS ($r = .71$, $p < .01$). The study also found predictive value in Stanford 10 in comparison to later TAKS scores, with math being more predictive than reading. Studies have used Stanford 10 as an outcome variable, often in relation to other reading measures. For instance, Chard and colleagues (2008) found that first grade passage comprehension was a strong predictor of third grade performance on Stanford 10; however, this relation was not examined concurrently.

An early study of the SAT by Watkins and Wiebe (1984) noted that while the assessment was well-standardized, there was little evidence of construct validity for the different subtests, particularly in young children (grade 1). They found that scores appeared to be impacted by general verbal fluency and comprehension. It is noted, however, that this was based on a much earlier version of the SAT and the current study seeks to examine older students.

Cognitive Abilities Test. The CogAT (CogAT; Lohman & Hagen, 2001) is a group-administered, standardized, and norm-referenced test of reasoning abilities for students in kindergarten through grade 12. It is comprised of three separate batteries measuring verbal, quantitative, and nonverbal reasoning. The test is stated to measure general ability and "overall efficiency of cognitive processes and strategies that enable individuals to learn new tasks and solve problems, especially

in the absence of direct instruction" (Lohman, 2002, p. 1). The authors note that the CogAT is intended to measure developed abilities as opposed to innate ability, and scores may be influenced by in-school experiences. The authors also state that the CogAT can help predict achievement scores, especially when administered with the Iowa Test of Basic Skills (ITBS; Hoover, Hieronymus, Frisbie, & Dunbar, 1993); the ITBS and CogAT were co-normed.

There are two CogAT editions: the Primary is used in grades K-2, and the Multilevel is administered to grades 3-12. The number of items administered varies depending on the student grade level. The batteries can be administered individually or collectively. The CogAT provides a universal scale score, standard score, percent rank, and stanine score for each battery. The standard score is 100, with a normative average at the 50th percentile, and a standard deviation of 16. An overall composite score is also produced when students take all three batteries; this is created by determining the mean of the three battery scale scores.

Examples of tests comprising the batteries are discussed below. In the Verbal battery presented to the older students, there are three tests – Verbal Classification, Sentence Completion, and Verbal Analogies. In the classification test, the child must determine how three key words are alike. In the Sentence Completion task, the student must read a sentence with a blank space and must choose from listed word options to answer the question. On the verbal analogies task, children are presented with verbal analogies with a word missing and must use verbal reasoning to complete the task.

The CogAT Quantitative Relations test includes word questions that require basic arithmetic skills. The Equation Building test requires basic math skills to determine how numbers and symbols may be combined to produce a specific numerical answer. Students are also asked to determine which number comes next in a numerical series on the Number Series subtest.

On the Nonverbal battery, the tasks require visual and spatial skills. On the Figure Classification test, the student is given three figures that are alike and they must choose an option that best corresponds with the other three figures. On Figure Analogies, the student is presented with three figures. The first two figures relate in some way, and the third figure goes with one of the answer choices in an analogous way. The Figure Analysis subtest shows the student a picture of a folded paper with holes punched in it. The student must figure out how the paper will appear (i.e., where the holes will be) when unfolded.

Some aspects of the CogAT's reliability and validity were explored by Latkin and Lohman (2011). They reported that the CogAT Nonverbal score had a relatively small standard error of measurement (e.g., Composite SEM = 2.2) in comparison to other ability measures. Additionally these researchers found that the CogAT Verbal battery correlates highest with the Verbal Ability cluster on the Woodcock-Johnson III (WJ-III; Woodcock, McGrew, & Mather, 2001) and the Verbal Scale on the Wechsler Intelligence Scale for Children – Third Edition (WISC-III; Wechsler, 1991). The Nonverbal battery of the CogAT was stated to correlate with the Raven Progressive Matrices test (Raven, Court, & Raven, 1996) and Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997), with a range from $r = .62$ to $r = .65$. The

Nonverbal battery also correlated the most with Block Design on the WISC-III and Fluid Reasoning and Thinking Ability clusters (r = .5 to r = .58) on the WJ-III.

Procedures

The students in this IRB-approved study were selected by stratified random selection by the Director of Gifted Education within the school district. The DESSA rating scales were distributed to the students' gifted education teachers, and one rating scale was completed for each student in the study in the early summer, just after the end of the school year. The teachers received a small monetary compensation for their participation in the study. Demographic information on the students was recorded, and student names were replaced with identification numbers prior to the research team's involvement in order to protect student anonymity. Completed rating scales were scored and recorded by the research team. This archival study was completed following the data collection.

CHAPTER 3

RESULTS

Descriptive statistics, correlations, *t*-tests, multivariate analysis of variances (MANOVAs), and regressions were discussed in regards to the current study's variable measures: achievement, socioemotional competence, and cognitive ability. Statistical results were conducted using SPSS version 21.

The outcome variable of achievement was operationalized as Stanford 10 standard normal curve equivalent (NCE scores) in the areas of reading, language, and math. NCE scores are normalized standard scores with a mean of 50 and a standard deviation of 21.06; these are on an equal interval scale. An achievement composite was obtained by creating a mean score of the three measures. Socioemotional competence or SEC was operationalized as the DESSA Total Protective Factor score as well as the eight scale scores: Self-Awareness, Social Awareness, Self-Management, Goal-Directed Behavior, Relationship Skills, Personal Responsibility, Decision Making, and Optimistic Thinking. Students' cognitive ability was estimated by scores on the CogAT. Standard scores were obtained for each student's performance on the verbal, quantitative, and nonverbal batteries, and a composite score was computed.

Descriptive Information

Means and standard deviations of study variables are reported in Table 1. The correlation coefficients were computed among the Stanford 10 composite, reading, language, and math standard scores; DESSA Total and all eight above noted SEC scale scores; and CogAT composite, verbal, quantitative, and nonverbal ability

scores. Using the obtained coefficients would have artificially lowered the correlation estimates, since there was restriction in the range of scores (Guilford & Fruchter, 1978). Correlation coefficients were then adjusted and corrected for restriction in range where appropriate, using the formula provided by Guilford and Fruchter (1978). These adjustments were made by dividing [$r_c(S_u/S_c)$] by the square root of 1 - r_c^2 + r_c^2 x (S_u^2/S_c^2). In this formula, r_c was the correlation within the restricted group (i.e., the original correlations calculated between CogAT and DESSA scores), and S_c was the standard deviation of the variable on which the restriction occurs (e.g., CogAT scores). Both obtained and corrected correlations are presented in Tables 2-3; the corrected correlations were interpreted in context of this study.

T-tests and MANOVAs were used to examine differences between gender and age groups in the study variables. Significant differences, found in gender and age, were presented in Tables 4 & 5-6, respectively. When differences were found, typically higher scores were distributed within either older age groups or in females rather than in males. While age groups were compared in the MANOVA and post hoc analyses, it is noted that the students' actual ages were used in the context of the correlation analyses.

Relations between Socioemotional Competency and Achievement Variables

The relations between SEC and achievement were examined using correlation and regression analyses. The Stanford 10 achievement composite score significantly correlated with the composite socioemotional competence measure, the DESSA Total, $r(122) = .40$, $p < .01$. Additionally, all eight of the DESSA scale

scores significantly correlated with the Stanford 10 achievement composite score, range of *r*s = .24 to .46, *p*s < .01 (Table 3).

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of age groups (split by grade sections) on achievement scores, and significant differences were found across the three age groups, Stanford 10 Composite Wilk's $\Lambda = .71$, $F(6, 238) = 7.39$, $p < .01$, multivariate $\eta^2 = .16$ (Table 5). The composite achievement scores were found to be significantly higher in grades 4-5 ($M = 81.13$) in comparison to grades 2-3 ($M = 68.10$), $p < .05$. However, regression analyses, using product terms to represent interactions (Cohen, 1978), found no significant interactions of age in the relation between measures of SEC and achievement, DESSA Total $b = -.24$, $t(122) = -1.67$, $p > .05$ (Table 7).

T-tests revealed significant differences between genders in the DESSA Total, $t(122) = 2.32$, $p < .05$, males' $M = 53.06$ and females' $M = 57.11$, and in three socioemotional competency scales: Personal Responsibility, $t(122) = 2.46$, $p < .05$, males' $M = 52.84$ and females' $M = 57.48$; Optimistic Thinking, $t(122) = 2.53$, $p < .05$, males' $M = 53.00$ and females' $M = 57.85$; and Relationship Skills, $t(122) = 3.33$, $p < .01$, males' $M = 52.51$ and females' $M = 58.63$. In all four cases, females were found to score higher than males (Table 4). Regression analyses indicated that the relation between the DESSA Total score and composite achievement score was moderated by gender, $b = -.60$, $t(122) = -2.52$, $p < .05$; females had significant positive relations between the DESSA Total scores and achievement composite scores, $r(122) = .39$, $p < .01$, while the males had a non-significant relation between these scores, $r(122) = -.01$, $p > .05$. This moderation trend – with significant positive

relations for females and non-significant relations for males – was also found in analyses between DESSA scale scores and composite achievement scores (Table 8). Specifically, gender moderated the relation between Personal Responsibility and composite achievement scores, b = -.45, $t(122)$ = -2.05, p < .05. The relation between Relationship Skills and composite achievement scores was also moderated by gender, b = -.56, $t(122)$ = -2.44, p < .05.

Socioemotional competencies and reading. The Stanford 10 reading scores significantly correlated with the Personal Responsibility, Goal-Directed Behavior, Relationship Skills, and Self-Awareness scale scores, $r(122)$ = . 18, p < .05, $r(122)$ = . 21, p < .05, $r(122)$ = .18 , p < .05, and $r(122)$ = .21 , p < .05, respectively. The reading scores did not significantly correlate with the DESSA Total scores, $r(122)$ = .15, p > .05. MANOVA analyses, and consequential ANOVA follow-up analyses, revealed that the reading scores were significantly higher in students in grades 2-3 (M = 80.91) than they were in those in grades 6-8 (M = 70.27), $F(2, 121)$ = 5.17, p , < .01, η^2 = .08. However, regression analyses indicated no significant age interaction in the relation between reading and DESSA Total scores, b = -.27, $t(122)$ = -1.47, p > .05. Additionally, using t-tests, no significant differences were found between genders in reading scores, $t(122)$ = 1.41, p >.05.

Socioemotional competencies and language. The Stanford 10 language scores significantly correlated with the DESSA Total scores, $r(122)$ = .21. , p < .05, and most of the socioemotional competency scale scores, range of rs = .17 to .27, ps < .05 – with the exception of the Optimistic Thinking scale, $r(122)$ = . 07, p > .05. Again, in ANOVA analyses subsequent to initial MANOVA analyses, language scores

were found to be significantly higher in grades 6-8 (M = 76.11) and 4-5 (M = 74.65) in comparison to grades 2-3 (M = 58.69), $F(2, 121) = 12.24$, p , < .01, $\eta^2 = .17$. However, regression analyses found no significant interactions of age in the relations between the DESSA Total and language scores, b = -.40, $t(122) = -1.86$, p > .05.

Significant differences were found, using t-tests, between males and females on Stanford 10 language scores, with females scoring higher, $t(122) = 2.62$, p = .01, males' M = 64.17 and females' M = 72.91. Additionally, regression analyses indicated that gender moderated the relations between DESSA Total and language, b = -1.04., $t(122) = -2.85$, p <.05; Personal Responsibility and language, b = -.86, $t(122)$ = -2.57, p < .05; and Relationship Skills and language, b = -.81, $t(122) = -2.28$, p < .05. In each of these cases, the females had significant positive relations, and the males had non-significant relations.

Socioemotional competencies and math. Math scores on the Stanford 10 significantly correlated with the DESSA Total score, $r(122) = .29$, p < .01, as well as all eight of the scale scores, range of rs = .18 to .34, ps < .05, (Table 3). Math scores were found to be higher in older students, based on MANOVA and follow-up ANOVA analyses, $F(2, 121) = 8.82$, p , < .01, $\eta^2 = .13$. Both the 4-5 grader students (M = 81.13) and 6-8 grade students (M = 80.49) scored significantly higher than the 2-3 grade students (M = 68.10) on the Stanford 10 math assessment, ps < .01. Regression analyses indicated, however, that no significant interaction of age was found between the DESSA Total and math scores, b = -.55, $t(122) = -.29$, p > .05.

Moreover, *t*-tests found no significant differences between males and females in math scores on the Stanford 10, $t(122) = -.71$, $p > .05$.

Socioemotional competency scales in predicting achievement. Most of the socioemotional competency scales did not predict the achievement composite or subtests (i.e., reading, language, or math) over-and-above the other SEC scales (Table 9). Three scales predicted achievement scores. One of the SEC subscales was previously hypothesized to be related to achievement – Self-Awareness. The Self-Awareness scale significantly predicted both the composite achievement scores, $R^2\Delta = .03$, $F(1, 115) = 4.04$, $p < .05$, as well as the math scores, $R^2\Delta = .04$, $F(1, 115) = 5.53$, $p < .05$, over-and-above the other SEC scales. Self-Awareness accounted for 4% of the variance in composite achievement and 3% of the variance in math scores in these models. Optimistic Thinking was also predictive of achievement scores over-and-above the other DESSA scales – in the composite achievement scores, $R^2\Delta = .04$, $F(1, 115) = 5.12$, $p < .05$, and in language, $R^2\Delta = .04$, $F(1, 115) = 5.58$, $p < .05$, and math scores, $R^2\Delta = .03$, $F(1, 115) = 3.92$, $p < .05$. Optimistic Thinking thus accounted for 4% of the variance in composite achievement and language; it also accounted for 3% of the variance in math scores. Another significant predictor was Relationship Skills; this SEC scale predicted math over-and-above the other SEC scales, $R^2\Delta = .04$, $F(1, 115) = 5.65$, $p < .05$, and it accounted for 4% of the variance in math, but Relationship Skills did not predict the other achievement subtests or composite. Goal-Directed Behavior was the other SEC scale originally hypothesized to relate to achievement, but this scale did not significantly predict achievement over-and-above the other SEC scale scores, composite CogAT $R^2\Delta = .01$, $F(1, 115) = .03$, $p > .05$.

Goal-Directed Behavior only accounted for 1% of the variance in overall achievement.

Cognitive Ability and its Relation with Achievement Variables

Overall, *t*-test group comparisons revealed no significant differences in mean composite cognitive ability scores between males and females, $t(122) = -.96$, $p > .05$. Additionally, MANOVA analyses found no significant differences in mean cognitive ability between age groups, Wilk's $\Lambda = .94$, $F(2, 121) = .98$, $p > .05$, and no significant interactions of age were found in regression analyses between composite cognitive ability scores and achievement scores, $b = .05$, $t(122) = .29$, $p > .05$.

Composite cognitive ability measures and achievement variables. The correlation between the composite CogAT scores and the Stanford 10 achievement composite scores was significant, $r(122) = .36$, $p < .01$. Additionally, the composite CogAT scores significantly correlated with all the achievement scores – Stanford 10 reading, $r(122) = .27$, $p < .01$; language, $r(122) = .18$, $p < .05$; and math, $r(122) = .35$, $p < .01$.

Verbal ability measures and achievement variables. Verbal ability scores significantly correlated with reading scores only, $r(122) = .16$, $p < .05$. In regression analyses (Table 10), however, verbal ability scores did not predict reading over-and above the other two cognitive ability subtest scores, $R^2\Delta = .02$, $F(1, 120) = 2.23$, $p > .05$, and verbal ability only accounted for 2% of the variance in reading in this model.

Quantitative ability measures and achievement variables. Quantitative ability scores significantly correlated with math scores, $r(122) = .32$, $p < .01$. In

regression analyses, quantitative ability scores predicted math scores over-and-above nonverbal ability scores, $R^2\Delta = .04$, $F(1, 121) = 5.91$, $p < .05$, and they accounted for 4% of the variance in math scores. Quantitative ability scores did not predict math over-and-above combined verbal and nonverbal ability scores, $R^2\Delta = .02$, $F(1, 120) = 3.08$, $p > .05$; in this model, quantitative ability only accounted for 2% of the variance. Quantitative ability scores also significantly correlated with the achievement composite, $r(122) = .25$, $p < .01$. The regression analyses did not find quantitative ability scores to predict composite achievement over-and-above the other cognitive subtests, $R^2\Delta = .02$, $F(1, 120) = 3.08$, $p > .05$, though.

Nonverbal ability measures and achievement variables. Significant correlations were observed between the nonverbal ability scores and math scores, $r(122) = .27$, $p < .01$. Additionally, significant correlations were found between the achievement composite and nonverbal ability scores, $r(122) = .18$, $p < .05$. Nonverbal ability scores were not found to significantly predict composite achievement over-and-above the other cognitive subtests (Table 10). Nonverbal ability scores, however, were found to significantly predict math scores over-and-above quantitative and verbal ability scores, $R^2\Delta = .03$, $F(1, 120) = 4.24$, $p < .05$. Additionally, nonverbal ability scores significantly predicted math scores over-and-above quantitative ability scores, $R^2\Delta = .05$, $F(1, 121) = 6.01$, $p < .05$; in this case, nonverbal ability accounted for 5% of the variance in math scores.

Relations between Cognitive Ability Scores and Socioemotional Competency Variables

The composite CogAT scores significantly correlated with the DESSA Total scores, $r(122) = .28$, $p < .01$, as well as each of the SEC scales, range of rs = .16 to .32, ps < .05. Additionally, the quantitative ability scores significantly correlated with the DESSA Total scores, $r(122) = .37$, $p < .01$, and all SEC scales, range of rs = .21 to .41, ps < .01. The nonverbal ability scores significantly correlated with Decision-Making scores only, $r(122) = .15$, $p < .05$. The verbal ability scores did not significantly correlate with the DESSA Total scores, $r(122) = .01$, $p > .05$, or any of the SEC scales. No significant interactions of age, $b = .22$, $t(122) = 1.71$, $p > .05$, or gender, $b = .17$, $t(122) = .83$, $p > .41$, were found between the DESSA Total and composite CogAT scores.

Relations between Cognitive Ability, Socioemotional Competency, and Achievement Variables

Hierarchical regression analyses were conducted to determine which scales and subtests predicted the most variance in the dependent achievement variables. Composite CogAT scores were not found to significantly predict composite achievement, $R^2\Delta = .03$, $F(1, 121) = 3.27$, $p > .05$, reading, language, or math scores over-and-above the DESSA Total scores (Table 11). On the other hand, the DESSA Total scores significantly predicted composite achievement, $R^2\Delta = .05$, $F(1, 121) = 6.99$, $p < .05$; language scores, $R^2\Delta = .03$, $F(1, 121) = 4.26$, $p < .05$; and math scores, $R^2\Delta = .05$, $F(1, 121) = 6.09$, $p < .05$, over-and-above the composite CogAT scores. Controlling for cognitive ability, the DESSA Total scores accounted for 5% of the

variance in overall achievement, 3% of the variance in language scores, and 5% of the variance in math scores. The DESSA Total scores did not significantly predict reading scores over-and-above the composite CogAT scores, $R^2\Delta = .01$, $F(1, 121) = 1.03$, $p > .05$.

CHAPTER 4

DISCUSSION

This study aimed to examine the relations between cognitive ability, socioemotional competence, and achievement in gifted children. Although researchers have previously studied aspects of these constructs, less research has looked at the combined relations of all three. This is especially true within the gifted population. Overall, the goal of this study was to examine the impact of socioemotional competence and cognitive ability in relation to achievement in the gifted population. Although several of the study's hypotheses were supported (e.g., gifted students with better-developed socioemotional competence demonstrated higher academic achievement and cognitive ability scores had significant positive correlations with measures of achievement), some contrary findings were also observed.

As noted previously, the findings of the present study indicate that gifted children with better-developed socioemotional competencies scored higher on standardized achievement measures than students with lower socioemotional competency scores did. This supports previous researchers' notion that socioemotional competencies may promote school success by allowing students to persist when faced with challenges, regulate their emotions, motivate themselves, and problem-solve (Aronson, 2002; Duckworth & Seligman, 2005; Merrell & Gueldner, 2010; Zins & Elias, 2006). This overall finding supports Durlak and colleagues' (2011) meta-analytic finding regarding the importance of social-emotional well-being in academic success.

Many of the DESSA Social Emotional Competency (SEC) scale scores significantly correlated with language, math, and the composite achievement scores. Goal-Directed Behavior and Self-Awareness were specifically hypothesized to relate to achievement. Scale scores on both of these DESSA subscales significantly correlated with the composite achievement test score on the Stanford 10 Achievement test (Stanford 10), as well as reading, language, and math scores. The Self-Awareness scale measured the child's understanding of his or her personal strengths and limitations, as well as a desire for self-improvement. In some ways this may relate to metacognition and self-efficacy, important educational psychology concepts, which been found to correlate with children's persistence with challenges (Aronson, 2002). The Goal-Directed Behavior scale measured a child's initiation of and persistence in completing tasks. Items associated with Goal-Directed Behavior ask questions such as if the child will "try to do his/her best," "seek out additional knowledge or information," and "seek out challenging tasks." These are behaviors that may be observed in an intrinsically motivated learner; intrinsically motivated children are more likely to use effective learning strategies and achieve at higher levels in school (Gottfried & Gottfried, 1996). However, when it came to which of these two DESSA scales or socioemotional competencies predicted achievement better, Self-Awareness significantly predicted composite achievement over-and-above the other scales, while Goal-Directed Behavior did not. This may indicate that one's awareness of strengths and limitations and one's desire for self-improvement are critically important for achievement.

Interestingly, the Optimistic Thinking scale was also a significant predictor of achievement (e.g., composite, language, and math scores), even while controlling for the other DESSA scales. This scale examines a child's confidence, hopefulness, and positive thinking. Researchers in Positive Psychology, such as Lyumbomirsky, King, and Diener (2005) have reported that one's emotions influences one's thoughts which in turn, affects one's overall adjustment and success. In fact, optimism has been linked to effective problem-solving, and academic and occupational success (Gillham, 2000). Being optimistic aids young people in addressing challenges confidently and can help them to be resilient when they face frustrating situations or failure (Shatté, Reivich, Gillham, & Seligman, 1999). Children who seek out challenges may be more likely to be intrinsically motivated learners; intrinsically motivated children are more likely to use effective learning strategies and achieve at higher levels in school (Gottfried & Gottfried, 1996).

Another area of socioemotional competency that was not anticipated to strongly relate to achievement was Relationship Skills. This scale significantly correlated with composite achievement, as well as with all three subject areas (reading, language, and math). However, Relationship Skills did not predict composite achievement over-and-above the other SEC scales. Relationship Skills, though, did predict math scores over-and-above the other SEC scales. One possible explanation might be that math tends to look at patterns and relations in numbers, and the Relationship Skills scale measures consistent performance of actions that promote connections with others, which may require an understanding of the patterns in behavior that are related to maintaining these relationships. Another

interpretation could be that a student's relationships with others impacts his or her motivation to learn as well as school success in school – through collaboration in problem-solving with other students, observations of peers modeling academic skills, and support provided by others (Schunk & Hanson, 1985; Zins et al., 2004).

Although previous research has found that early socioemotional competency is important and predictive of later achievement, the current study did not find a significant interaction of age between overall socioemotional competency and achievement. It was expected that younger children would perform higher on standardized measures of achievement; however, the opposite was found. It is possible that his may relate to still-developing metacognitive skills and study skills (Schneider, 2002).

Previous studies have found that gifted girls tend to demonstrate higher socioemotional competence (D'Ilio & Karnes, 1987; Helt, 2008), and the current study also found that females scored higher in overall SEC scores. In addition, it was found that gender moderated the relationship between overall SEC and academic achievement scores. Females had a significant positive relation between these two variables, while males had a nonsignifcant relation. This may indicate that females are able to better utilize their socioemotional competencies to help seek support, problem-solve, and persist with challenges (Aronson, 2002; Rose & Rudolph, 2006; Schunk & Hanson, 1985), which in turn relates to higher achievement.

Over the years, research has shown that males and females in the general population tend to perform similarly in their academic performance (Lummis & Stevenson, 1990; Meece & Daniels, 2008). However, research within the gifted

population specifically has found more gender differences in achievement (Olszewski-Kubilius & Turner, 2002; Preckel et al., 2008). The findings from the current study found no gender differences in composite achievement scores, but females scored significantly higher than males in language. This finding may support early research which suggested that females have higher verbal ability than males (Halpern, 1986; Maccoby, 1966), which may lead to higher academic performance in a language-based area. However, gender differences were not found in verbal ability in the gifted students in this study. Other researchers, such as Colangelo and Kerr (1990), noted that on the ACT assessment, there are more females than males who had perfect scores on the English subtest. These higher language scores may also relate to females' high self-efficacy in this subject, in that they may have more confidence in their language skills (Freeman, 2003).

Gender was also examined in relation to cognitive ability scores. As suspected, no significant differences were found between gifted boys and girls in the composite or subtest scores of the cognitive ability measure. This supports previous studies indicating that cognitive ability tends to be similar across genders (Brody, 1992; Hyde & Linn, 1988).

Many researchers have purported that intelligence and cognitive ability relate to student achievement (Petrides, Frederickson, & Furnham, 2004; Neisser, 1996; Newsome, Day, & Catano, 2000), and some researchers even contended that intelligence is causally related to achievement (Jensen, 2000). The data from the current study supports the finding that cognitive ability and achievement scores

significantly relate – with overall cognitive ability scores correlating with overall achievement in all three areas: reading, language, and math.

The present study also sought to determine which areas of cognitive ability might more strongly relate to the different areas of standardized academic achievement. As suspected, verbal ability scores significantly correlated with reading achievement scores. On the other hand, verbal ability scores on their own were not enough to predict reading achievement scores – verbal ability scores did not predict reading over-and-above quantitative and nonverbal ability scores. Overall cognitive ability was more strongly correlated with reading scores, so this may suggest that reading may require a mix of abilities such as those related to language and reasoning.

In addition, quantitative ability scores were found to significantly correlate with math scores, but they did not predict math scores over-and-above the other two cognitive ability scores. Interestingly, nonverbal scores predicted math scores over-and-above the other two cognitive abilities, while quantitative ability scores were only found to significantly predict math scores over-and-above the nonverbal scores.

These findings indicate that both quantitative ability and nonverbal scores are important in predicting math achievement, but that nonverbal ability scores predicted more variance. Quantitative and nonverbal ability estimates both require higher-level reasoning skills. In nonverbal ability measures, students must consider relationships between abstract concepts, and in quantitative ability measures, students must problem-solve and reason with numbers. Standardized math

achievement measures, such as on the Stanford 10, also require students to use logic and math reasoning, as well as problem-solving strategies (Pearson, 2004), so a similar skill-set may be utilized when students are assessed on measures of quantitative ability, nonverbal ability, and math achievement. This may relate to planning processes (to select and apply strategies to efficiently solve a problem), an aspect of executive functioning, which has been found to relate to mathematic performance (Isman & Naglieri, 2011). Moreover, planning strategy instruction has been found to improve students' performance in math (Naglieri & Johnson, 2000).

Additional findings of the present study show significant positive correlations between composite cognitive ability test scores and the composite SEC scores, as well as all SEC subscales. Children with higher cognitive ability scores in this study were also rated by their teachers as having stronger socioemotional competencies. Interestingly, quantitative ability scores also significantly related to all SEC scales and the SEC composite. It is possible that, on quantitative ability measures, students must use problem-solving and look at relations between numbers; problem-solving and analytical skills may assist students in becoming socially and emotionally competent.

Most of the previous literature indicates that cognitive ability and student achievement are strongly linked (Petrides, Frederickson, & Furnham, 2004; Neisser, 1996; Newsome, Day, & Catano, 2000), and intelligence scores are often used to predict academic achievement (Parker & Benedict, 2002). On some assessments, the constructs of cognitive ability and achievement may even overlap to some degree, in that there are often some comparable task demands on tests of ability and

achievement. Despite prior findings regarding the relation between cognitive ability and achievement, the current study noted that composite cognitive scores did not significantly predict achievement scores when controlling for overall socioemotional competency. On the contrary, and unexpectedly, overall socioemotional competency predicted achievement over-and-above composite cognitive scores.

Although both cognitive ability scores and SEC scores significantly correlated with achievement, this study indicates that, in children identified as gifted, socioemotional competencies are more important to achievement, as they were more predictive of achievement than were cognitive ability scores. That is, in a population of children with a high level of intellectual ability, differences in achievement are better predicted by socioemotional competencies than they are by cognitive ability. This is a surprising finding, yet a handful of other researchers have reached similar conclusions. For instance, Petrides, Frederickson, and Furnham's (2004) determined that social and emotional development may moderate the relation between cognitive and academic performance. Also, this is in congruence with Wang, Heartel, & Walberg's (1993) findings that student characteristics, such as social and affective, impacted students' academic achievement. The predictive nature of socioemotional competency in achievement scores highlights the importance of promoting socioemotional competency, even in the gifted population, in which the trend may be for students to have somewhat advanced emotional development (Bland, Sowa, & Callahan, 1994).

In examining characteristics of socioemotional competencies and achievement measures, there may be an underlying construct contributing to the development of both: executive functioning, which allows people to control and coordinate thoughts and behavior (Luria, 1966; Shallice, 1982). Executive functioning, which has been found to relate to both socioemotional competency and achievement, includes selective attention, decision-making, working memory, and inhibition (Blakemore & Choudhury, 2006). Achievement and socioemotional competency are also both associated with the area of the brain associated with executive functioning – the prefrontal cortex (Bar-On et al., 2003). This area has been found to be important in both decision-making as well as socioemotional competence (Bar-On et al., 2003). Decisions and choices children make can impact personal lives and how people relate to others (Bar-On et al., 2003).

Executive functioning, discrete from general cognitive ability, may help in managing and controlling emotions, being flexible in situations, making decisions, and solving problems within a social context (Bar-On, Tranel, Denburg, & Bechara, 2003; Riggs, Jahromi, Razza, Dillworth-Bart, & Mueller, 2006). Emotions serve a role in organizing and directing behavior (Fisher, Shaver, & Carnochan, 1990) and impact attention, memory and problem-solving (Matthews & Wells, 1999). Studies have also found that children with poor executive functioning tend to have weak emotion regulation (Jahromi & Stifter, 2008). Additionally, a longitudinal study found that young children's inhibitory control predicted both behavioral outcomes and social competency two years later (Nigg, Quamma, Greenberg, & Kusché, 1998).

With regards to achievement, executive functioning tasks measure processes such as planning, self-monitoring, working memory, and impulse control; these are important to math and reading performance, which require complex skills and coordination of these executive functioning components (Best & Miller, 2010; Blair & Razza, 2007; Bull, Epsy, & Wiebe, 2008). Executive functioning has been found to be more important for school readiness than intelligence, and it is predictive of math and reading achievement throughout the school years (Blair & Razza, 2007; Gathercole, Pickering, Knight, & Stegmann, 2004). Literature on school readiness and school success also notes the importance of the self-regulation aspect of executive functioning (Normandeau & Guay, 1998; Wentzel, Weinberger, Ford, & Feldman, 1990). St Clair-Thompson and Gathercole (2006) found that other aspects of executive functioning, such as working memory and inhibition, predict general academic learning.

Limitations and Future Directions

It is important to note potential limitations to the present study, which may affect the interpretation of the results. For instance, some limitations within the sample and method were present. It is possible that a selection bias was present that affected which students were initially identified as gifted. For example, if a child had poor social skills and emotion regulation, this behavior may distract teachers and parents from identifying signs of high cognitive ability or academic performance and limit the referral of these students for assessment for gifted services. In addition, as noted earlier in the study, the final sample utilized was not exactly representative of the ethnic distribution of the general population. This limits the

ability to generalize the findings to all groups, given that some minority groups were underrepresented (e.g., Native American, Hispanic, and African American) and at least one group was overrepresented (e.g., Asian).

Additional limitations were present in the methods used to assess the constructs in the study. For instance, socioemotional competency was measured through teacher ratings exclusively. It would have been beneficial to utilize concurrent guardian ratings, as well as self-reports, to provide multiple views of a child's behavior and competency across different settings. This could possibly reduce some bias a teacher may have towards certain students, potentially impacting the validity of the reports. Other possible suggestions for future studies would be to use behavioral observations or sociometric procedures in addition to rating scales for a more comprehensive view of socioemotional competence.

The interpretation of the current findings may be further limited by the assessment used to measure the children's cognitive abilities. The CogAT, although commonly used as a measure of cognitive ability in gifted assessment, has a ceiling standard score of 150, which may limit the ability to differentiate students with higher scores on the measure. Other cognitive ability measures might be less likely to have ceiling effects, yet due to the cost of individualized assessments, the majority of the students in the district gifted program had only CogAT scores available. Additionally, some researchers have indicated that measures of ability and achievement often have similar task demands (Naglieri & Ford, 2005), so this must be taken into account when interpreting the relations between the two constructs.

Moreover, some limitations exist within the Stanford 10 measure. The Stanford 10 has multiple test levels, meaning a student may have different types of tasks presented for an academic subject area (e.g., reading) depending on their grade level. For instance, basic sentence reading is included for students in level Primary 1, which includes students in second grade, but not third. Thus, while standard scores are reported based on norm groups for each grade level, the construct of *reading achievement*, for example, may be represented differently across grades.

Moreover, third variables, not measured in the present study, could potentially exist and influence the relations between socioemotional competence, cognitive ability, and achievement. For instance, future studies may wish to examine family characteristics or home environments, which have been found to impact cognitive ability and eventual life outcomes such as achievement (Gottfried et al., 1994). Additionally, it is possible that socioeconomic status may relate to the findings, but this information was not available for individual students in the present study. Also, motivational concepts were discussed in relation to achievement, but these were not directly measured and may provide additional insight into the prediction of achievement scores in gifted children.

Due to the possibility that executive functions impact both socioemotional competencies and achievement, future studies should address executive functioning. In addition to measures of socioemotional competency and achievement, researchers should include both rating forms and behavioral observations to study executive functioning in relation to these constructs.

Examples of executive function measures include the Planning section of the Cognitive Assessment System (CAS; Naglieri & Das, 1997) and longer assessments such as the Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000). Additionally, a more recent measure of executive functions was created to not only identify strengths and weaknesses, but also to help guide and assess intervention – the Comprehensive Executive Function Inventory (Naglieri & Goldstein, 2013).

Conclusions

Prior to this study, few researchers had examined the relations between socioemotional competence, cognitive ability, and achievement; this was especially true when it came to the gifted population. The current study demonstrates that measures of both socioemotional competence and cognitive ability relate positively to academic achievement. Most notably, the findings also indicate that socioemotional competency was a stronger predictor of achievement than cognitive ability scores were in the gifted population.

This knowledge could have important implications for educators and parents. Educators should consider implementing SEL programs in the hopes of promoting academic achievement, since it appears that socioemotional competencies predict achievement when controlling for gifted children's cognitive ability scores. Although the findings of this study cannot be considered causal, previous longitudinal studies have found that social competence and SEL program implementation may lead to later positive outcomes in academics (Durlak et al., 2011; Welsch et al., 2001).

Multiple SEL programs have been developed in the hopes of improving socioemotional competencies of children. Some have been found to have positive effects not only on socioemotional development, but also on school outcomes. For instance, the Child Development Project (CDP; Schaps, Battistich, & Solomon, 1997) was found to promote prosocial behavior, and was also associated with more academic motivation and increases in academic performance over time (Schaps, Battistich, & Solomon, 2004). Additionally, research on implementation of the Social Decision Making/Social Problem Solving Project (SDM/SPS; Elias & Clabby, 1989) found more prosocial behavior, better coping, better attendance, better learning skills, as well as higher math, language, and social studies performance (Elias, 2004). Researchers in the area of neuropychological processing have suggested that SEL programs also promote the integration of executive functioning, verbal processing, and emotional awareness (Greenberg et al., 2004; Riggs et al., 2006). Additionally, teachers can use cognitive strategy training and metacognition as approaches to assist children to develop better executive functioning, especially in problem-solving situations (Efklides & Misailidi, 2010; McCloskey, Perkins, & van Diviner, 2008).

Areas of socioemotional competency that were found to significantly predict achievement (controlling for the other SEC scales) were Self-Awareness, Optimistic Thinking, and Relationship Skills. These are areas in which teachers of gifted children can focus their attention in building competency. In promoting self-awareness, those working with gifted children may encourage students to accurately assess their strengths and weaknesses in different areas, ask for

clarification and feedback, and learn metacognitive strategies to check for comprehension. This might also promote self-efficacy in the students.

Another area to target is optimistic thinking, and to build competency in this area, educators and guardians can support students in building confidence, setting high expectations, and thinking in a positive and hopeful manner. However, it is important to note that children need to set realistic, positive expectations, because fantasies tend not to promote motivation and success (Oettingen & Meyer, 2002). In the schools, teachers and psychologists can help children focus on their strengths and help children view events in optimistic ways (Terjesen, Jacofsk, Froh, & DiGiuseppe, 2004). In addition, programs have been developed to help promote optimism, by directly teaching children to develop this competency, such as the Penn Resiliency Program (Gillham, Jaycox, Reivich, Seligman, & Silver, 1990). Researchers, such as Seligman have studied positive psychology and have published different types of strategies to build optimism in students (e.g., Seligman, Steen, Park & Peterson, 2005).

Furthermore, Relationship Skills were found to predict achievement, even when controlling for other SEC scales. While the nature of this relation is not entirely apparent (and appears to be more pertinent for gifted girls), it could still benefit students to grow competent in performing positive social behaviors such as complimenting others, greeting them, showing appreciation for them, and attracting positive attention from peers and adults. Relationship skills can prove to be especially valuable as schools emphasize collaborative problem-solving and group

projects; in fact, the use of cooperative learning activities have been found to increase student motivation and achievement (Slavin, 1995).

In conclusion, this study supports the notion that, although cognitive ability is an important factor in predicting achievement, socioemotional competency is even more strongly related to achievement in gifted children. Executive functions may also play a part in the development of socioemotional competency and achievement. Educators may wish to concentrate on ways in which socioemotional competence and executive functions may be developed in children with high abilities, in the hopes of promoting not only their social and emotional development, but also their academic achievement.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	Linda Caterino Kulhavy EDB
From:	Mark Roosa, Chair Soc Beh IRB
Date:	09/27/2011
Committee Action:	**Exemption Granted**
IRB Action Date:	09/27/2011
IRB Protocol #:	1109006852
Study Title:	Gifted and Social Skills

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(1) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

Table 1

Means and Standard Deviations of Study Variables

Construct	Mean	*SD*
Age	10.96	1.81
Age Groupings (1-3)	1.97	.83
Gender (0-1)	.40	.49
Personal Responsibility	55.65	10.31
Optimistic Thinking	55.94	10.30
Goal-Directed Behavior	54.44	10.82
Social Awareness	54.31	10.51
Decision-Making	55.56	10.05
Relationship Skills	56.21	10.01
Self-Awareness	55.19	10.16
Self-Management	55.69	9.07
DESSA Total	55.51	9.41
Verbal	125.69	13.74
Quantitative	124.41	10.34
Nonverbal	125.10	12.56
CogAT Composite	129.61	8.22
Reading	75.56	15.72
Language	69.46	19.60
Math	76.30	17.13
SAT10 Achievement Composite	73.77	12.66

Notes. Age was grouped into "1" = Grades 2-3, "2" = Grades 4-5, and "3" = Grades 6-8; Gender was grouped into "0" = female and "1" = male; DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition.

Table 2

Obtained Correlations of Variables

	1	2	3	4	5	6	7	8	9
1 Age	-								
2 Gender (0-1)	-.05	-							
Socioemotional Competencies Scores									
3 Personal Responsibility	-.05	-.22*	-						
4 Optimistic Thinking	-.13	-.23**	.73**	-					
5 Goal-Directed Behavior	-.02	-.17	.90**	.75**	-				
6 Social Awareness	.04	-.14	.74**	.71**	.67**	-			
7 Decision-Making	.04	-.13	.83**	.77**	.86**	.81**	-		
8 Relationship Skills	-.04	-.30**	.74**	.72**	.72**	.76**	.82**	-	
9 Self-Awareness	-.04	-.18	.70**	.83**	.77**	.66**	.83**	.79**	-
10 Self-Management	.00	-.13	.85**	.72**	.76**	.85**	.84**	.77**	.67**
11 DESSA Total	-.04	-.21**	.91**	.87**	.90**	.86**	.94**	.89**	.87**
Cognitive Ability Scores									
12 Verbal	.13	-.01	.01	.02	.08	-.09	-.06	.05	.03
13 Quantitative	-.12	.07	.21*	.28**	.19*	.14	.20*	.23*	.26**
14 Nonverbal	.03	.03	.03	.01	.03	.12	.12	-.02	.06
15 CogAT Composite	.06	.09	.12	.15	.16	.09	.12	.13	.17
Achievement Scores									
16 Reading	-.24**	.13	.14	.10	.16	-.01	.07	.13	.16
17 Language	.41**	-.22*	.25**	.07	.23*	.17	.22*	.18	.16
18 Math	.35**	.06	.24**	.15	.22*	.23*	.28**	.15	.25**
19 SAT10 Achievement Composite	.27**	-.14	.30**	.14	.28**	.19*	.27**	.21*	.26**

	10	11	12	13	14	15	16	17	18
1 Age									
2 Gender (0-1)									
Socioemotional Competencies Scores									
3 Personal Responsibility									
4 Optimistic Thinking									
5 Goal-Directed Behavior									
6 Social Awareness									
7 Decision-Making									
8 Relationship Skills									
9 Self-Awareness									
10 Self-Management	-								
11 DESSA Total	.90**	-							
Cognitive Ability Scores									
12 Verbal	-.04	.10	-						
13 Quantitative	-.19*	.25**	.14	-					
14 Nonverbal	.11	.05	-.31**	.00	-				
15 CogAT Composite	.13	.15	.54**	.64**	.41**	-			
Achievement Scores									
16 Reading	.05	.11	.14	.09	-.00	.14	-		
17 Language	.21*	.20*	.00	.06	.09	.10	.14	-	
18 Math	.25**	.24**	-.11	,21*	.21*	.19*	-.02	.65**	-
19 SAT10 Achievement Composite	.24**	.26**	.01	.16	.14	.19*	.48**	.87**	.78**

Notes. DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition.

* $p < .05$, ** $p < .01$

Table 3

Corrected Correlations of Variables

	1	2	3	4	5	6	7	8	9
1 Age	-								
2 Gender		-							
Socioemotional Competencies Scores									
3 Personal Responsibility	-.05	-.22**	-						
4 Optimistic Thinking	-.12	-.23**	-	-					
5 Goal-Directed Behavior	-.02	-.16*	-	-	-				
6 Social Awareness	.04	-.13	-	-	-	-			
7 Decision-Making	.04	-.13	-	-	-	-	-		
8 Relationship Skills	-.04	-.30**	-	-	-	-	-	-	
9 Self-Awareness	-.04	-.17*	-	-	-	-	-	-	-
10 Self-Management	.00	-.15	-	-	-	-	-	-	-
11 DESSA Total	-.04	-.22**	-	-	-	-	-	-	-
Cognitive Ability Scores									
12 Verbal	.15	-.02	.01	.02	.10	-.10	.07	.05	.04
13 Quantitative	-.18	.11	.32**	.41**	.29**	.21**	.29**	.34**	.39**
14 Nonverbal	.03	.04	.04	.01	.03	.15	.15*	-.03	.07
15 CogAT Composite	.11	.17*	.23**	.29**	.30**	.16*	.23**	.24**	.32**
Achievement Scores									
16 Reading	.31**	.17	.18*	.14	.21*	-.02	.09	.18*	.21*
17 Language	.43**	-.23**	.27**	.07	.24**	.18*	.23**	.19*	.17*
18 Math	.42**	.06	.29**	.18*	.27**	.28**	.34**	.18*	.31**
19 SAT10 Achievement Composite	.42**	-.22*	.46**	.24**	.44**	.30**	.42**	.34**	.41**

	10	11	12	13	14	15	16	17	18
1 Age									
2 Gender									
Socioemotional Competencies Scores									
3 Personal Responsibility									
4 Optimistic Thinking									
5 Goal-Directed Behavior									
6 Social Awareness									
7 Decision-Making									
8 Relationship Skills									
9 Self-Awareness									
10 Self-Management	-								
11 DESSA Total	-	-							
Cognitive Ability Scores									
12 Verbal	-.05	.01	-						
13 Quantitative	.28**	.37**	-	-					
14 Nonverbal	.14	.06	-	-	-				
15 CogAT Composite	.24**	.28**	-	-	-	-			
Achievement Scores									
16 Reading	.06	.15	.16*	.14	.00	.27**	-		
17 Language	.23**	.21*	.00	.09	.11	.18*	-	-	
18 Math	.30**	.29**	-.12	.32**	.27**	.35**	-	-	-
19 SAT10 Achievement Composite	.38**	.40**	.01	.25**	.18*	.36**	-	-	-

Notes. DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition. The corrections were made by dividing $[r_c(S_u/S_c)]$ by the square root of $1 - r_c^2 + r_c^2 \times (S_u^2/S_c^2)$. Corrected correlations not reported within constructs.

* $p < .05$ (critical value .150 for one-tailed and .178 for two-tailed), ** $p < .01$ (critical value .210 for one-tailed and .232 for two-tailed)

Table 4

T-Tests for Gender Differences in Study Variables

Construct	*t*	Female *M*	Male *M*
Personal Responsibility	2.46*	57.48	52.84
Optimistic Thinking	2.53*	57.85	53.00
Goal-Directed Behavior	1.89	55.93	52.16
Social Awareness	1.54	55.48	52.51
Decision-Making	1.43	56.60	53.96
Relationship Skills	3.33**	58.63	52.51
Self-Awareness	1.94	56.61	53.00
Self-Management	1.48	56.67	54.18
DESSA Total	2.32*	57.11	53.06
Verbal	.15	125.84	125.45
Quantitative	-.77	123.80	125.35
Nonverbal	-.31	124.81	125.55
CogAT Composite	-.90	129.04	130.49
Reading	1.41	77.19	73.03
Language	2.62*	72.91	64.17
Math	-.75	75.42	77.65
SAT10 Achievement Composite	1.58	75.17	71.63

* $p < .05$, ** $p \leq .01$

Table 5

MANOVA and ANOVA Analyses of Age Differences in DESSA and CogAT scores

	MANOVA			ANOVA		Means by Grade Grouping		
Construct	Wilk's Λ	F	multivariate η^2	F	η^2	2-3	4-5	6-8
DESSA Scores (all scales and Total)	.86	.97	.07					
Personal Responsibility				.26	.00	56.30	54.70	55.88
Optimistic Thinking				.33	.01	56.93	55.55	55.23
Goal-Directed Behavior				.64	.01	55.23	52.85	55.18
Social Awareness				.19	.00	53.64	54.30	55.05
Decision-Making				.60	.01	55.09	54.65	56.98
Relationship Skills				.87	.01	57.36	54.55	56.60
Self-Awareness				.28	.01	55.77	54.20	55.53
Self-Management				.27	.00	55.70	54.93	56.43
DESSA Total				.29	.01	56.02	54.58	55.88
CogAT Scores (subtests and composite)	.93	.98	.03					
Verbal				.86	.01	125.55	123.75	127.78
Quantitative				.33	.01	125.41	124.05	123.68
Nonverbal				1.56	.03	122.52	127.18	125.88
CogAT Composite				.57	.01	128.86	129.33	130.73

Notes. DESSA = Devereux Student Strengths Assessment, CogAT = Cognitive Abilities Tests; no significant differences in Bonferroni posthoc comparisons were found between any groups on these measures.

* $p < .05$, ** $p < .01$

Table 6

MANOVA and ANOVA Analyses of Age Differences in Stanford 10 Scores

	MANOVA			ANOVA		Means by Grade Grouping		
Construct	Wilk's Λ	F	multivariate η^2	F	η^2	2-3	4-5	6-8
Achievement Measures (Reading, Language, Math, and Composite)	.71	7.39**	.16					
Reading				5.17**	.08	80.91 ++	74.97	70.27 ++
Language				12.24**	.17	58.69 ++ ++	74.65 ++	76.11 ++
Math				8.82**	.13	68.10 ++ ++	81.13 ++	80.49 ++
SAT10 Achievement Composite				4.77*	.07	69.23 +	76.92 +	75.62

Notes. SAT10 = Stanford Achievement Test Series – tenth edition.

* $p < .05$, ** $p \leq .01$; +$p < .05$, ++ $p \leq .01$ indicate significant differences in Bonferroni posthoc comparisons between the marked groups

Table 7

Regression Analyses of Interaction Effects of Age

Variable 1	Variable 2	*b*	*t*
DESSA Total	SAT10 Achievement Composite	-.24	-1.67
DESSA Total	Reading	-.27	-1.47
DESSA Total	Language	-.40	-1.86
DESSA Total	Math	-.06	-.29
CogAT Composite	SAT10 Achievement Composite	.049	.29
CogAT Composite	DESSA Total	.22	1.71

Notes. DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition.

* $p < .05$; ** $p < .01$

Table 8

Regression Analyses of Interaction Effects of Gender

Variable 1	Variable 2	*b*	*t*
DESSA Total	SAT10 Achievement Composite	-.60	-2.52*
DESSA Total	Language	-1.04	-2.85**
Personal Responsibility	SAT10 Achievement Composite	-.45	-2.05*
Personal Responsibility	Language	-.86	-2.57*
Optimistic Thinking	SAT10 Achievement Composite	-.38	-1.69
Optimistic Thinking	Language	-.67	-1.94
Relationship Skills	SAT10 Achievement Composite	-.56	-2.44*
Relationship Skills	Language	-.81	-2.28*
CogAT Composite	SAT10 Achievement Composite	.01	.03
CogAT Composite	Language	-.32	-.76
CogAT Composite	DESSA Total	.17	.83

Notes. DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition.

* $p < .05$; ** $p < .01$

Table 9

Regression Analyses for Socioemotional Competency Scales with Achievement Scores

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Composite Achievement				
Step 1: DESSA scales			.13	2.36*
Step 2: Personal Responsibility	.46	.31	.02	2.15
Step 1: DESSA scales			.10	1.89
Step 2: Optimistic Thinking	-.48*	.21	.04	5.12*
Step 1: DESSA scales			.14	2.71*
Step 2: Goal-Directed Behavior	-.05	.29	.01	.03
Step 1: DESSA scales			.14	2.69*
Step 2: Social Awareness	-.08	.22	.01	.14
Step 1: DESSA scales			.14	2.71*
Step 2: Decision-Making	.04	.31	.01	.01
Step 1: DESSA scales			.14	2.64*
Step 2: Relationship Skills	-.14	.22	.01	.41

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Composite Achievement				
Step 1: DESSA scales			.11	2.06
Step 2: Self-Awareness	.51*	.25	.03	4.04*
Step 1: DESSA scales			.14	2.69*
Step 2: Self-Management	.11	.31	.01	.13
Predicting SAT10 Reading				
Step 1: DESSA scales			.09	1.58
Step 2: Personal Responsibility	.33	.40	.01	.67
Step 1: DESSA scales			.09	1.67
Step 2: Optimistic Thinking	-.09	.27	.01	.10
Step 1: DESSA scales			.09	1.63
Step 2: Goal-Directed Behavior	.23	.37	.01	.38
Step 1: DESSA scales			.08	1.42
Step 2: Social Awareness	-.37	.28	.01	1.67

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Reading				
Step 1: DESSA scales			.08	1.41
Step 2: Decision-Making	-.53	.40	.01	1.79
Step 1: DESSA scales			.08	1.48
Step 2: Relationship Skills	.32	.28	.01	1.33
Step 1: DESSA scales			.08	1.47
Step 2: Self-Awareness	.38	.33	.01	1.37
Step 1: DESSA scales			.09	1.68
Step 2: Self-Management	-.07	.39	.01	.03
Predicting SAT10 Language				
Step 1: DESSA scales			.10	1.80
Step 2: Personal Responsibility	.61	.50	.01	1.52
Step 1: DESSA scales			.07	1.19
Step 2: Optimistic Thinking	-.79*	.33	.04	5.58*

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Language				
Step 1: DESSA scales			.11	2.05
Step 2: Goal-Directed Behavior	.03	.46	.01	.01
Step 1: DESSA scales			.11	2.05
Step 2: Social Awareness	-.01	.35	.01	.01
Step 1: DESSA scales			.11	2.03
Step 2: Decision-Making	.14	.49	.01	.09
Step 1: DESSA scales			.11	2.04*
Step 2: Relationship Skills	-.05	.35	.01	.02
Step 1: DESSA scales			.10	1.92
Step 2: Self-Awareness	.35	.40	.01	.77
Step 1: DESSA scales			.11	2.03
Step 2: Self-Management	.14	.49	.01	.08

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Math				
Step 1: DESSA scales			.15	2.82
Step 2: Personal Responsibility	.45	.42	.01	1.12
Step 1: DESSA scales			.13	2.37*
Step 2: Optimistic Thinking	-.56*	.29	.03	3.92*
Step 1: DESSA scales			.15	2.84**
Step 2: Goal-Directed Behavior	-.40	.39	.01	1.03
Step 1: DESSA scales			.15	2.99**
Step 2: Social Awareness	.12	.30	.01	.15
Step 1: DESSA scales			.14	2.77*
Step 2: Decision-Making	.50	.42	.01	1.41
Step 1: DESSA scales			.11	2.01*
Step 2: Relationship Skills	-.70*	.30	.04	5.65*

DESSA Predictors	*B*	*SEB*	ΔR^2	$F\Delta$
Predicting SAT10 Math				
Step 1: DESSA scales			.11	2.12*
Step 2: Self-Awareness	.80*	.34	.04	5.53*
Step 1: DESSA scales			.15	2.94**
Step 2: Self-Management	.27	.41	.01	.44

Notes. DESSA = Devereux Student Strengths Assessment; SAT10 = Stanford Achievement Test Series – tenth edition. Step 1 of each regression analysis included seven of the eight DESSA scales, excluding only the predictor variable. All beta values refer to the values from Step 2.

* $p < .05$; ** $p < .01$

Table 10

Regression Analyses for Cognitive Ability Subtests with Achievement Scores

CogAT Predictors	*B*	*SEB*	ΔR^2	*F*
Predicting SAT10 Composite Achievement				
Step 1: Verbal, Nonverbal			.02	1.45
Step 2: Quantitative	.19	.11	.02	3.08
Step 1: Nonverbal			.02	2.52
Step 2: Quantitative	.20	.11	.03	3.38
Step 1: Quantitative, Verbal			.03	1.67
Step 2: Nonverbal	.15	.09	.02	2.64
Step 1: Quantitative			.03	3.35
Step 2: Nonverbal	.14	.09	.02	2.54
Predicting SAT10 Reading				
Step 1: Quantitative, Nonverbal			.01	.48
Step 2: Verbal	.16	.11	.02	2.23

CogAT Predictors	*B*	*SEB*	ΔR^2	*F*
Predicting SAT10 Math				
Step 1: Verbal, Nonverbal			.02	1.45
Step 2: Quantitative	.19	.11	.02	3.08
Step 1: Nonverbal			.05	5.81*
Step 2: Quantitative	.35*	.14	.04	5.91*
Step 1: Quantitative, Verbal			.06	4.10*
Step 2: Nonverbal	.26*	.13	.03	4.24*
Step 1: Quantitative			.05	5.71*
Step 2: Nonverbal	.29*	.12	.05	6.01*

Notes. CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition. All beta values refer to the values from Step 2.

* $p < .05$; ** $p < .01$

Table 11

Regression Analyses for Socioemotional Competency and Cognitive Ability Scores with Achievement Scores

Predictors	*B*	*SEB*	ΔR^2	*F*
Predicting SAT10 Composite Achievement				
Step 1: DESSA Total			.07	8.53**
Step 2: CogAT Composite	.24	.14	.03	3.27
Step 1: CogAT Composite			.04	4.74*
Step 2: DESSA Total	.31**	.12	.05	6.99**
Predicting SAT10 Reading				
Step 1: DESSA Total			.01	1.52
Step 2: CogAT Composite	.24	.17	.02	1.95
Step 1: CogAT Composite			.02	2.45
Step 2: DESSA Total	.15	.15	.01	1.03

Predictors	*B*	*SEB*	ΔR^2	*F*
Predicting SAT10 Language				
Step 1: DESSA Total			.04	4.87*
Step 2: CogAT Composite	.16	.21	.01	.57
Step 1: CogAT Composite			.01	1.13
Step 2: DESSA Total	.39*	.19	.03	4.26*
Predicting SAT10 Math				
Step 1: DESSA Total			.06	7.53**
Step 2: CogAT Composite	.33	.18	.02	3.21
Step 1: CogAT Composite			.04	4.59*
Step 2: DESSA Total	.40*	.16	.05	6.09*

Notes. DESSA = Devereux Student Strengths Assessment; CogAT = Cognitive Abilities Tests; SAT10 = Stanford Achievement Test Series – tenth edition. All beta values refer to the values from Step 2.

* $p < .05$; ** $p < .01$