The Self-Concepts of Gifted and Nongifted Students: A Meta-Analysis

by

Kristin M. Litster

B.Ed., University of Victoria, 2004

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Supervisory Committee

Dr. Jillian Roberts, Supervisor
(Educational Psychology and Leadership Studies)

Dr. Joan Martin, Departmental Member
(Educational Psychology and Leadership Studies)

Dr. John Anderson, Departmental Member
(Educational Psychology and Leadership Studies)

Dr. Alison Preece, Outside Member
(Curriculum and Instruction)

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Abstract

The current meta-analysis compares the self-concepts and perceived competencies of gifted and nongifted students. Gifted and nongifted students' beliefs about themselves differ across six domains. Using meta-analytic methods to synthesize the results of 37 studies, this meta-analysis shows that gifted students score significantly higher than nongifted students on measures of perceived academic and behavioral competence. Gifted students score significantly lower than nongifted students in perceived athletic competence. The small degree of difference between groups in the appearance, global, and social domains suggest that gifted students are not at significant advantage or disadvantage in these areas. Moderator variables such as grade level and measure account for systematic differences between gifted and nongifted students' academic and behavioral perceptions of competence. The current study concludes with recommendations and guidelines for future self-concept and perceived competence research.

Table of Contents

Acknowledgments

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List of Figures

List of Tables

Introduction

Peoples' perceptions of gifted students range from "nerds" to highly motivated achievers (Dixon, 1998). Researchers propose many definitions of the term gifted, determining gifted status by intellectual ability, academic potential, school achievement, creativity, specific areas of strength, or other requirements (Callahan, 2000). Identification methods vary and students identified in different ways may receive the same gifted label. Gifted students have different interests, abilities, and levels of achievement (Clark & Tollefson, 1991). With variation in public opinion and actual ability levels, the question arises just how do gifted students view themselves? These students differ from peers in that they have been deemed "gifted," but do they rate their abilities higher than those of their average intelligence peers?

Self-concept is a broad construct referring to individuals' perceptions of themselves; it is often used interchangeably with self-esteem (Baumeister, Campbell, Krueger, & Vohs, 2003). Since the 1970s, over 50 studies have compared the self-concepts of gifted students with the self-concepts of nongifted students. Unfortunately, findings have been contradictory. Some studies have found that gifted students have higher self-concepts than nongifted students, others found that gifted students have lower self-concepts than nongifted students, and still others have found that there are no self-concept differences between gifted students and their nongifted peers. A 1993 meta-analysis by Hoge and Renzulli (1993) synthesized research from 1977 to 1992 in an attempt to clarify these findings. However, a more current meta-analysis is warranted for five reasons.

First, it has been fourteen years since the publication of Hoge and Renzulli's work. Studies have since addressed this topic using new self-concept measures (Field & Yando, 1991; McCoach & Siegle, 2003a), minority populations (Worrell, 2002), and youth participating in different types of gifted programs (Olszewski, Kulieke, & Willis, 1987; Zeidner & Schleyer, 1999). The emergence of new studies suggests that a more current, comprehensive meta-analysis would provide a more accurate portrayal of how gifted students' perceptions of themselves compare with those of nongifted students.

Second, the conceptualization and methodology of self-concept have evolved since 1993. A recent literature review indicates that self-esteem, or global self-concept, is not consistently predictive of either positive or negative outcomes (Baumeister, Campbell, Krueger, & Vohs, 2003). Baumeister et al. suggest that studying only general self-concept is insufficient because the factors influencing self-concept vary greatly. Whereas self-concept is a global, overall indication of the image individuals hold of themselves (Hoge & Renzulli, 1993), Baumeister et al. recommend examining individuals' perceived competence in specific domains to provide additional insight. Researchers often use the terms self-concept and perceived competence interchangeably; however, Baumeister et al. suggest that this is inaccurate. While self-concept is how individuals view themselves, perceived competence is how individuals view their abilities in specific domains. Hoge and Renzulli (1993) did not distinguish between self-concept and perceived competence in their meta-analysis. Instead of examining trends in specific domains of perceived competence, they examined overall trends by computing unweighted means across the domains. Baumeister et al.'s (2003) research indicates that averaging across competence domains has less predictive power and is difficult to

interpret. Thus, a new meta-analysis that examines trends in specific domains of perceived competence should provide added insight.

Third, a new meta-analysis is warranted because while older measures focused on global self-concept (for example, the Piers-Harris Scale; Piers, 1984), newer research uses domain-specific measures (Harter, 1985, 1988) and distinguishes conceptually between a number of aspects of self-concept (e.g. perceived competence, self-worth, self-esteem, and self-efficacy). In addition, there are now psychometrically refined versions of the older measures of global self-concept. Hoge and Renzulli's (1993) meta-analysis summarizes research conducted using the measures available until 1993. A more current meta-analysis can include results from these new measures.

Fourth, societal beliefs and attitudes about the gifted have changed (Jackson, 2004), necessitating a fresh examination of gifted students' self-concept and perceived competence. The cohorts used in Hoge and Renzulli's (1993) meta-analysis were primarily educated during the 1980s. Students' educational experiences have likely changed since that time as beliefs and attitudes about giftedness have changed (Jackson, 2004). For these reasons, it is necessary to include samples experiencing recent educational practices. Studying the self-concepts of students from the 1970s, 1980s, 1990s, and the new century provides samples representative of giftedness over 30 years and adjusts overall findings comparing the self-concepts and perceived competencies of gifted and nongifted students to include more recent findings.

Lastly, the 1993 meta-analysis by Hoge and Renzulli included only published studies. Citing the importance of including literature meeting methodological standards and the importance of reader access to literature, Hoge and Renzulli rejected unpublished

work such as graduate student theses and conference papers. This approach is problematic because it does not address the "file-drawer" phenomenon whereby findings are not published because of statistically nonsignificant results (Cooper & Hedges, 1994). There exists an increased likelihood that studies with significant results consistent with hypotheses will be published (Olson et al., 2002); this is often referred to as a publication bias (Cooper & Hedges, 1994). Although the inclusion of unpublished literature can be problematic if research is not properly screened for quality (Kraemer, Gardner, Brooks, & Yesavage, 1998), it is possible to screen studies based on their methodological qualities rather than their publication status. A new meta-analysis incorporating unpublished studies will provide findings more representative of research conducted in this area.

A current picture of gifted students' self-concept and perceived competence is important for several reasons. First, low self-concept, even among the gifted, is associated with negative outcomes such as depression and other emotional problems, low academic achievement, and low expectations of success (Cole, 1991; Phillips, 1984; Strang, 1960; Van Boxtel & Monks, 1992). Individuals' self-concepts and perceived competencies are strong predictors of future achievement and healthy emotional adjustment (Davis, 1995; Marsh, Byrne, & Shavelson, 1988; Windecker-Nelson, Melson, & Moon, 1997). Second, self-concept influences how people respond and adapt to the world; individuals with low self-concept may adapt poorly to their surroundings (Ablard, 1997; Miserandino, 1996). Third, by summarizing the self-concepts of gifted students, it is possible to identify factors that put gifted students at risk of developing low self-concept (age, gender, etc.). As Davis (1995) suggests, gifted students' emotional needs

have been underestimated because they are more academically capable, leading to a belief that they are also more capable of handling their own psychological needs. “Little has been accomplished in furthering our basic understanding of the socioemotional development of gifted students” (Brounstein, Holahan, & Dreyden, 1991, p. 198).

The purpose of the current study is to synthesize research comparing the self-concepts and perceived competencies of gifted students (those identified by schools or researchers as gifted) and nongifted students (those not identified as gifted). The present meta-analysis will include studies conducted since Hoge and Renzulli’s (1993) meta-analysis and results will extend beyond the scope of the prior study by examining moderators of perceived competence in five domains. As well, the inclusion of recent studies will incorporate a more recent cohort of gifted students. Further, unpublished dissertations will be included to address possible publication biases. Lastly, the new meta-analysis will include studies using recently established measures of self-concept and perceived competence. This meta-analysis will address the extent to which gifted and nongifted students’ self-concepts and perceived competencies differ and will examine potential sources of difference (adapted from Hoge & Renzulli, 1993). The results of the current study hold significant implications for future educational policy and planning. Programs such as the Schoolwide Enrichment Program (Hoge & Renzulli, 1993; Renzulli, 1985) already address self-concept but may require revision if gifted students are shown to have significant deficits.

Literature Review

This chapter begins by providing operational definitions of global self-concept, perceived competence, giftedness, and nongiftedness for use throughout the thesis. This literature review includes examples of contradictory research on the self-concepts and perceived competencies of gifted students and describes the kind of meta-analysis required to synthesize these findings. The chapter concludes with a discussion of variables that may hold influence over the differences between gifted and nongifted students' self-concepts and perceived competencies.

Definitions of Key Terms

Global self-concept. The current meta-analysis study incorporates a multidimensional approach to self-concept by examining how gifted and nongifted students view themselves in multiple domains. Global self-concept is defined as the overall "image we hold of ourselves" (Hoge & Renzulli, 1993, p. 449).

Perceived competence. How individuals view their competence in specific domains refers to perceived competence. Although many researchers use the terms academic self-concept, behavioral self-concept, social self-concept, appearance self-concept, and athletic self-concept, it is more accurate to refer to perceived academic, behavioral, social, appearance, and athletic competence. Perceived competence requires individuals to evaluate their abilities in these domains. Rather than focusing on affective factors such as how individuals feel about their abilities, perceived competence focuses on individuals' perceptions of skill. In the current study, perceived competence is more specific than self-concept, referring to domain-specific self-evaluations rather than an

overall way of viewing oneself. For example, perceived athletic competence refers to how individuals perceive their athletic skill.

Giftedness. Although there are many definitions of giftedness, the current meta-analysis will utilize an inclusive approach to defining giftedness. For the purposes of this study, gifted students are those students identified by studies as gifted. By subscribing to one specific definition, this study would omit a great deal of research. An inclusive definition allows the inclusion of more research and provides a total gifted sample representative of gifted students across geographical, educational, and philosophical divides.

Although both Hoge and Renzulli's (1993) meta-analysis and the current study incorporate studies with nonlabeled gifted students (those students not labeled gifted by their schools but considered gifted by researchers), these studies are in the minority. Only 11 of the 69 analyses included in the prior meta-analysis used nonlabeled gifted students. The present study will note, when reported, the methods of designation used to identify students as gifted and will compare the findings of nonlabeled gifted students with those from labeled gifted students. This will help identify differences due to how giftedness was determined.

Nongiftedness. The term nongifted is used to differentiate gifted students from their peers. In general, this term refers to those students not labeled gifted by either their schools or researchers. Note that a few studies compare the self-concepts of gifted students with those of normative samples. These normative groups may include gifted students, decreasing the magnitude of the difference between the groups. However, because giftedness is generally operationalized as the top 3-5% of IQ scores (Callahan,

2000), the influence of these students' self-concepts on the sample mean should be minimal. Thus, although this study acknowledges that "nongifted" is a misnomer for a minority of studies, the term most clearly differentiates between those students deemed gifted and those students not deemed gifted.

Self-Concept

A *self-concept* is an "image we hold of ourselves" (Hoge & Renzulli, 1993, p. 449). More specifically, self-concept refers to "our attitudes, feelings and knowledge about our abilities, skills, appearance, and social acceptability" (Byrne, 1984, p. 429). Self-concept is often used interchangeably with self-esteem; however, self-esteem refers to how individuals feel about themselves (Baumeister, Campbell, Krueger, & Vohs, 2003) whereas self-concept reflects both affective and evaluative factors (Marsh & Shavelson, 1985a). Self-concept is generally measured by self-report (Field & Yando, 1991; Harter, 1982, 1985, 1988; McCoach, 2000; McCoach & Siegle, 2003a; Piers, 1984) using individuals' self-evaluations and descriptions to determine self-concept scores. An individual's overall self-concept or "perception of one's overall worth as a person" (Harter, Whitesell, & Junkin, 1998, p. 656) is often referred to as self-concept, global self-worth, global self-concept, or general self-concept. Unfortunately, many researchers use these terms interchangeably. This thesis uses the term "global self-concept" to refer to the overall image an individual holds of himself or herself.

Research supports the division of global self-concept into multiple subcategories based on domains of function (Baumeister, Campbell, Krueger, & Vohs, 2003; Harter, 1982, 1985, 1988; Marsh & Shavelson, 1985a, 1985b). Supplemental to global self-concept, Harter (1985, 1988) identifies academic, appearance, athletic, behavioral, and

social perceived competencies for children and adolescents (adolescents' domains also include close friendship, job, and romantic appeal). Individuals may have high perceived competence in one domain while holding comparatively low perceived competence in another (Harter, 1982). Thus, examining domain-specific perceived competence scores as well as overall self-concept scores provides a more complete portrayal of individual and group trends in how people see themselves.

People's self-evaluations may differ from their actual performance; they may perform well but evaluate their abilities either higher or lower than their actual competence (Harter, 1982). Individuals may also place more value on one or more domain than on other(s) (Harter, 1982). Domain-specific perceived competence contributes to individuals' global self-concepts. The positivism or negativity of a person's global self-concept can have great influence on his/her life, and "viewing oneself as competent to achieve valued goals has been implicated repeatedly as essential to healthy development" (Phillips & Zimmerman, 1990, p.41).

Self-concept and perceived competence are socially influenced; peoples' beliefs about themselves develop in social contexts (Hergenhahn & Olson, 2005). Albert Bandura describes humans as "above all, social organisms . . . it is on the basis of our observations and interaction with other people that our cognitions, including our standards for performance and for moral judgment are developed" (Hergenhahn & Olson, 2005, p. 362). Thus, although global self-concepts and domain-specific perceived competencies are people's beliefs about themselves, these beliefs do not develop in isolation; they are influenced by the social comparison of an individual's own abilities

with those of others (Schwarzer & Jerusalem, 1989, as cited in Zeidner & Schleyer, 1999).

Festinger's (1954) social comparison theory suggests that people compare themselves to those around them (Janos, 1990). Festinger (1954) proposes that in the absence of objective criteria, people resort to comparing themselves to others in search of subjective criteria. In the realm of self-concept, this theory implies that students compare themselves to peers, developing self-concepts and perceptions of competence in relation to the perceived abilities of others (Janos, 1990). According to social comparison theory, peer ability or opinion influences individuals' self-concepts; perceived competencies vary according to the ability levels of others in their surroundings. Cole (1991) suggests that children as young as 7 or 8 use social comparison information to develop beliefs about their abilities.

Development and self-concept. Children's self-concepts change as they develop; their perceptions of themselves become more "differentiated" and "comprehensive" as they age (Shapka & Keating, 2005, p.84). Three- to four-year-old children have difficulty using social comparison information to inform their self-concept, struggle to differentiate between their desired and actual selves, and tend to use "all-or-none thinking" when describing themselves and/or their competencies (Harter, 1999, p.41). Thus, young children's self-concepts are often overly positive (Harter, 1999). Young children have difficulty creating global self-concepts but may describe themselves in terms of their cognitive skills, physical abilities and appearances, conduct, and friendships (Harter, 1990b).

By ages 5 to 7, children are capable of reporting global self-concept as well as five additional domains of perceived competence: academic, social, appearance, athletic, and behavioral (Harter, 1985). Children's social comparison skills improve significantly (Cole, Maxwell, & Martin, 1997) and they are capable of "more complex processing of self-relevant information" (Cole, Maxwell, & Martin, 1997, p.57). However, their self-concepts and evaluations of their own competencies remain quite positive (Harter, 1999).

During late childhood (ages 8 to 11), children are better able to describe themselves in abstract terms such as "popular" and "mean" (Harter, 1999). The role of social comparisons in self-concept and perceived competence formation increases as children become more conscious of the opinions and abilities of others (Phillips & Zimmerman, 1990). As well, these children can describe their competencies and acknowledge that their abilities in different areas may vary; the all-or-none thinking lessens (Harter, 1999). For example, a child at this age may report that he or she is "smart" at Math but "dumb" at Science.

By early adolescence, youth differentiate between eight domains of perceived competence (Harter, 1988, 1990b). These youth can integrate multiple personal characteristics to determine their perceived level of competence (for example, combining smart, curious, and creative to support a positive perception of cognitive competence). The role of social comparison information continues to increase during this period of development (Harter, 1999).

During middle adolescence, social comparison is especially influential in the development of self-concept and perceived competence (Harter, 1990b). Youth at this age may receive contradictory feedback from school, peers, and family, causing internal

confusion. Increased sensitivity to the opinions of others increases the potential influence of negative feedback; the global self-concepts of youth in middle adolescence tend to be lower than during prior stages of development (Harter, 1990b). Harter (1999) suggests that many of the difficulties encountered by youth prior to late adolescence are countered during this phase, leading to higher global self-concepts by early adulthood.

Measures of self-concept and perceived competence. Many measures evaluate self-concept and perceptions of competence in youth. Two of the most commonly used measures are the Self-Perception Profile for Children (SPPC; Harter, 1985) and the Self-Perception Profile for Adolescents (SPPA; Harter, 1988). These measures include domain-specific subscales of perceived competence as well as measures of global self-concept; both have well-documented reliability and validity. The Self-Description Questionnaires I-III (Marsh, 1988a, 1988b, 1988c) include self-report subscales for athletic ability, appearance, social acceptance, academic, and other domains. There are three Self-Description Questionnaire (SDQ) measures: one for preadolescents, one for adolescents, and one for late adolescents. The Piers-Harris Children's Self-Concept Scale (Piers, 1984) provides a global self-concept score as well as behavior, academic, appearance, anxiety, popularity, and happiness/satisfaction cluster scales. Other measures include the School Attitude Assessment Survey (McCoach, 2000) and the Tennessee Self-Concept Scale (Fitts, 1965).

Giftedness

Early research on giftedness includes Sir Francis Galton (1869) and his book, *Hereditary Genius*. Galton proposed the heritability of intelligence and his observations strongly influenced societal and educational beliefs about giftedness (Callahan, 2000).

Since that time, “countless” definitions of giftedness have appeared in both mainstream and educational contexts (Renzulli, 2002). Renzulli (2002) suggests organizing definitions along a continuum ranging from conservative (restrictive) to liberal (flexible).

In the United States, research on giftedness has overlapped with research on intelligence since Terman adapted the Binet-Simon test to create the Stanford-Binet Intelligence Scale (Terman, 1916). In 1926, Terman defined giftedness as “the top 1% in general intellectual ability, as measured by the Stanford-Binet Intelligence Scale or comparable measure” (p. 26). Renzulli (2002) describes this approach to giftedness as conservative because individuals either do or do not meet IQ requirements for giftedness. This definition excludes individuals gifted artistically, athletically, or in leadership, and it identifies only the most intellectually gifted. Although Terman’s (1926) definition provides an easy means of identifying the gifted, it reflects a very conservative, exclusive view of giftedness.

Terman used children’s scores on his intelligence scale (above 140) to identify gifted participants for his longitudinal study. In following individuals identified by IQ as gifted during childhood, Terman found that individuals’ IQ scores remained relatively stable over decades (Cravens, 1992). Terman consequently suggested that IQ was an appropriate measure of giftedness because it consistently measured his gifted sample at scores significantly higher than the mean. As a result, intelligence (as measured by intelligence tests) and the identification of the gifted have been linked for most of the 20th century (Callahan, 2000).

Since the proposal of Terman’s (1926) conservative definition, many more liberal definitions have been put forth that acknowledge more flexible and subjective

interpretations of giftedness (Renzulli, 2002). In a review of gifted literature from 1982 to 1994, Renzulli (2004) writes that researchers agree that an IQ score alone is not the ideal way to identify giftedness. Rather, definitions of giftedness have changed over time to reflect talents beyond IQ.

> The United States Department of Education (1993) describes gifted students as: Children and youth with outstanding talent *perform or show the potential for performing* at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. (p. 3)

Thus, the U.S. federal definition of giftedness includes students with exceptional talents beyond those measured by intelligence tests. However, in the U.S., school districts most often utilize the IQ definition of giftedness, focusing on high intellectual performance capability (1993).

In Canada, education is mandated by the provinces and territories; definitions of giftedness and approaches to gifted education vary between regions (Lupart, Pyryt, Watson, & Pierce, 2005). Students identified as gifted in one province or territory may not fit designation criteria in another province or territory. Further, identification procedures and educational approaches vary from one school district to another, leading to great variability in the education of gifted students within the same Canadian region (Lupart, Pyryt, Watson, & Pierce, 2005). Thus, there is no overall Canadian conception of giftedness.

The British Columbia Ministry of Education (2002) states that:

> A student is considered gifted when she/he possesses demonstrated or potential abilities that give evidence of exceptionally high capability with respect to intellect, creativity, or the skills associated with specific disciplines. Students who are gifted often demonstrate outstanding abilities in more than one area. They may demonstrate extraordinary intensity of focus in their particular areas of talent or interest. However, they may also have accompanying disabilities and should not be expected to have strengths in all areas of intellectual functioning. (p. 51)

The BC Ministry of Education further states that the identification and assessment of gifted students should involve multiple criteria and should consider information from multiple sources (2002). Appropriate methods of assessment include teacher observation, records of student achievement, interviews with students/parents/teachers, and tests of achievement or intelligence. However, the number of assessment methods utilized and the criteria for participation in gifted education vary by school district (Lupart, Pyryt, Watson, & Pierce, 2005).

Two of the most well-known liberal conceptions of giftedness are Renzulli's (1978) three-ring definition and Sternberg's (1985) triarchic model of giftedness. In 1978, Renzulli described gifted behavior as the interaction of three variables: intellectual ability, creativity, and task commitment (see Figure 1). Renzulli's (1978) definition identifies between 15-25% of students as gifted.

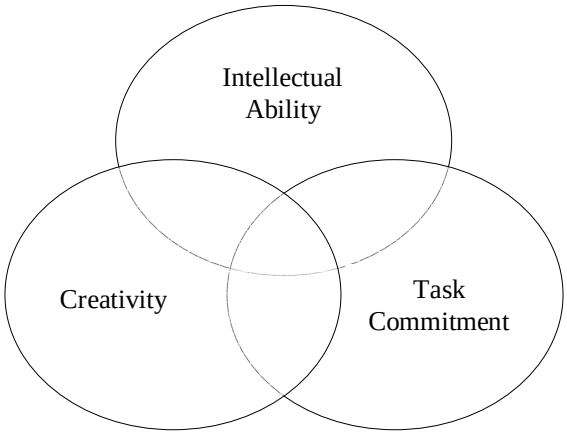

Figure 1. Renzulli's three-ring conception of giftedness.

Sternberg (1985) also proposes a three-part model of giftedness. However, Sternberg's triarchic model includes analytic, creative, and practical giftedness. He suggests that individuals can be gifted in any of these three areas but that the most gifted individuals are those with strong capacities in all three domains who balance and know when to use each skill (Sternberg, 1997).

Although these conceptions of giftedness identify individuals with exceptional creative, intellectual, or leadership skills as gifted, in practice those with intellectual gifts as measured by IQ tests are the students most often labeled "gifted" (Abeel, Callahan, & Hunsaker, 1994). Many schools continue to rely on IQ for the assessment and placement of students in gifted programs (Abeel, Callahan, & Hunsaker, 1994) and intellectual giftedness remains the most commonly identified form of giftedness (Callahan, 2000).

Unfortunately, the use of intelligence test scores results in an underidentification of gifted students (Sternberg, 2004). Sternberg (2004) identifies four key "dubious" assumptions underlying the use of such tests: (a) quickness equals intelligence, (b) achievement equals intelligence, (c) testing must be done in a stressful situation, and (d) precise scores equal validity. The IQ approach to giftedness is not based on theory. However, it is practical because IQ tests are generally predictive of academic achievement (Callahan, 2000; Kubiszyn & Borich, 1987). There is a high correlation of approximately .60 between academic achievement and intelligence tests (Kubiszyn & Borich, 1987). Further, IQ tests provide a standardized method of identification. Thus, many school districts feel justified in relying on one score to determine whether students deserve the "gifted" designation (Callahan, 2000).

Types of gifted programming. The approaches and settings used to educate gifted students vary in length, grouping, task type, and task difficulty (Callahan, 2001). Some gifted students remain in general education classrooms and work on individualized tasks, some leave classrooms for enrichment, and some attend schools designed specifically for gifted students. The British Columbia Ministry of Education (1995) identifies the following strategies to address content needs:

1. Acceleration (advanced curriculum or placement of student in a higher level course for some or all of his/her schooling)
2. Telescoping (reduction in time for student to cover the curriculum)
3. Compacting (student knowledge is assessed and curriculum areas in which they prove competent are eliminated)

4. Independent Study (students pursue their own interests or individually explore course material)
5. Tiered Assignments (assignments address the same material as the rest of the class but are assigned according to ability)
6. Learning Centers (students participate in learning activities to extend learning on a topic)

The British Columbia Ministry of Education also suggests planning activities to foster "higher level thinking, creative thinking, problem solving, and research skills" (1995, p.23).

Giftedness and development. Research provides a relatively thorough understanding of typical intellectual development in youth (Horowitz, 2004). One focus has been the differences between typical intellectual development and those youth on the lower end of the intelligence continuum; less research has focused on the upper end of this continuum (Horowitz, 2004). Depending on the method of identification, between 3% and 25% of youth are gifted (Callahan, 2000). Thus, the intellectual development of a potentially large proportion of the population lacks the attention warranted.

Giftedness and Self-Concept

The self-concepts and domain-specific perceived competencies of gifted students have been the focus of many studies (Chan, 2001; Colangelo, Kelly, & Schrepfer, 1987; Field et al., 1998; Hoge & McSheffrey, 1991; Hoge & Renzulli, 1993; Li, 1988; Van Boxtel & Monks, 1992). Gifted students' self-concepts and beliefs about their worth as individuals vary (Li, 1988; McCoach & Siegle, 2002). Klein and Cantor (1976) suggest that identification as gifted does not guarantee positive self-concept or perceived

competence. Gifted students may be more emotionally unstable than their nongifted peers (Schauer, 1976) and may be more likely to suffer from emotional problems (Strang, 1960), factors with the potential to influence the positivism or pessimism of gifted students' self-concepts.

In order to be "gifted," students demonstrate high capacity in some area; generally, this is intellectual ability. For individuals differentiated from others by one potential ability (Brody & Benbow, 1986), the importance of this ability in defining their worth is expected to be substantial. Indeed, academic competence holds more weight in determining the global self-worth of gifted students than it does for nongifted students (Hoge & McSheffrey, 1991).

Harter et al. (1998) suggest that global self-concept is somewhat determined by the importance individuals place on their perceived successes and failures. Low global self-concept is associated with negative outcomes such as depression and low academic achievement (Cole, 1991; Van Boxtel & Monks, 1992). Phillips (1984) suggests that students' perceptions of their abilities, rather than their actual abilities, are predictive of achievement motivation and behavior. She found that academically competent children with low perceived competencies set lower achievement standards and held lower expectations for themselves than children with average or high perceived competence. Such outcomes may have long-term implications for the achievement motivation and orientation of gifted youth with low perceived competence and may place such students at risk for drastic underachievement relative to their actual capabilities (Phillips, 1984).

Gifted students are differentiated from their peers by their intellectual abilities or their gifted label. In addition, some gifted students are estranged from same-age peers

because of grade acceleration, particularly high expectations from teachers and/or parents, or social isolation as a result of their school performance (Janos, 1990). Janos (1990) reports that many gifted students "feel different" from their nongifted peers (p.101). It is thus reasonable to believe that gifted and nongifted students' global self-concepts and perceived competencies may differ.

Research Questions and Rationale

Gifted students may experience school very differently from their nongifted peers and may not feel like their peers (Janos, 1990), necessitating a comparison of the global self-concepts and perceived competencies of gifted and nongifted students. The potential effects of differences make such a study an important contributor to the field of gifted research. Low self-concept and perceived competence are associated with many negative possible consequences. This study assumes that the self-concepts and perceived competencies of nongifted students are representative of the general population (excluding gifted individuals). Thus, if gifted students are shown to have lower self-concepts or perceived competencies than nongifted students, they can be described as below average in the applicable domain(s). Low self-concepts place students at risk, suggesting a need for corrective or preventative intervention.

Although many researchers have compared the self-concepts of gifted students with the self-concepts of nongifted students, findings are contradictory. The previous meta-analysis (Hoge & Renzulli, 1993) was published 14 years ago and was limited by its exclusion of unpublished literature. Changing attitudes towards giftedness (Jackson, 2004) and the publication of new studies and measures necessitate the creation of a new

meta-analysis to incorporate new information and improve upon limitations of the previous study.

Additional factors may influence the relation between self-concept and giftedness. Many studies demonstrate the influence of both age (Harter, 1985, 1988, 1990a, 1990b, 1999) and gender (Hoge & McSheffrey, 1991; Kelly & Colangelo, 1984; Li, 1988; Schneider, Clegg, Byrne, Ledingham, & Crombie, 1989; Shapka & Keating, 2005) on students' self-concepts and perceived competencies. Hoge and Renzulli (1993) discuss the importance of examining the potential influence of these variables when comparing the global self-concepts and perceived competencies of gifted and nongifted students. In addition to sample characteristics, study characteristics may also influence the degree to which gifted students' and nongifted students' global self-concept and perceived competencies differ (Hoge & Renzulli, 1993). Meta-analysis permits the examination of such variables.

The current meta-analysis will use existing studies to address the following questions:

1. How do the self-concepts and perceived competencies of gifted students compare to those of nongifted students?
2. Are differences in gifted and nongifted students' self-concepts and perceived competencies moderated by:
    a. grade
    b. gender
    c. type of comparison (comparisons of gifted, nonlabeled gifted, control, and normative groups of students)
    d. measure

e. gifted program participation

f. year of study

g. publication status

h. method of gifted designation

Research Comparing the Self-Concepts of Gifted and Nongifted Students

What does existing research tell us about gifted and nongifted students' self-concepts and perceived competencies? Unfortunately, there have been many contradictory findings in this area, making conclusions difficult. The small sample sizes of many studies further complicate findings because power is limited in such studies.

The following discussion of prior research includes findings from several studies in order to demonstrate some of the contradictions common to this area of research. In addition to findings from Hoge and Renzulli's (1993) meta-analysis, this literature review includes studies not addressed in their analyses. Some of these studies were conducted after the 1993 meta-analysis while others were conducted prior to 1991 but were not included in Hoge and Renzulli's (1993) study. The domains discussed include global self-concept and perceived academic, behavioural, athletic, social, and appearance competencies. Although some measures include additional domains, most include one or more of these six areas.

Global self-concept. Using 20 analyses to compare the global self-concepts of gifted and nongifted students, Hoge and Renzulli (1993) found a small mean weighted effect size of .19; gifted students had higher global self-concepts than nongifted students. However, using Harter's (1985) SPPC, Li (1988) found no statistically significant differences between the global self-concepts of gifted and nongifted students.

Nonsignificant differences were also demonstrated by Callahan, Cornell, and Loyd (1990). Neither of these studies were included in Hoge and Renzulli's (1993) meta-analysis.

Perceived academic competence. This domain of perceived competence has the most commonly agreed upon findings by researchers. Using the results of 16 analyses, Hoge and Renzulli's (1993) meta-analysis demonstrated a low medium mean weighted effect size of .47. Gifted students had higher perceived academic competence than did nongifted students. Using Harter's (1985) SPPC, Li (1988) also found statistically significantly higher perceived academic competence for gifted students than for nongifted students. Many other studies support the finding that gifted students have higher perceived academic competence than nongifted students (Ablard, 1997; Brounstein, Holahan, & Dreyden, 1991; Colangelo, Kelly, & Schrepfer, 1987; Field et al., 1998; Kelly & Colangelo, 1984; McCoach & Siegle, 2002).

Perceived behavioral competence. Hoge and Renzulli (1993) found a small mean weighted effect of .37, suggesting that gifted students had higher perceived behavioral competence than did nongifted students. However, this calculation used only six analyses and caution is necessary in interpreting this conclusion. Using Harter's (1985) SPPC, Li (1988) also found statistically significantly higher perceived behavioral competence for gifted students than for nongifted students.

Perceived athletic competence. Unfortunately, Hoge and Renzulli's (1993) meta-analysis combined athletic and appearance into a single "physical" domain without explanation. However, Chan (2002) found a correlation of only .21 between the athletic and appearance domains on the SPPA. Using 12 analyses, Hoge and Renzulli found a

mean weighted effect size of -.08, indicating that gifted students had lower perceived "physical" competence than nongifted students.

Without information on the results of different studies on perceived athletic competence, no meta-analytic findings are available for this domain. The small correlation between these two domains warrants individual examination of these subscales. Using Harter's (1985) SPPC, Li (1988) found that gifted students had statistically significantly lower perceived athletic competence than a nongifted control group. In contrast, using the SDQ-II (Marsh, 1990), Marsh, Plucker, and Stocking found no statistically significant differences between gifted and nongifted students' perceptions of athletic competence (2001).

Perceived social competence. Hoge and Renzulli (1993) found that the perceived social competence of gifted students from 15 analyses did not differ significantly from that of nongifted students (mean weighted effect size of .02). Using Harter's (1985) SPPC, Li (1988) also found no statistically significant differences between the perceived social competence of gifted and nongifted students. In contrast, studies by Kelly and Colangelo (1984) and Bain and Bell (2004) found significantly higher perceptions of social competence for gifted students than for nongifted students.

Perceived appearance competence. For the reasons listed for the athletic domain, no meta-analytic findings are available from Hoge and Renzulli (1993). They found that gifted students had slightly lower perceived competence than nongifted students in their "physical" domain (Hoge & Renzulli, 1993). Using Harter's (1985) SPPC, Li (1988) found no statistically significant differences between the perceived appearance competence of gifted students and nongifted students. No significant differences were

found by Callahan et al. (1990) when using Harter's (1988) SPPA. Bain and Bell (2004) found higher perceived appearance competence for gifted students with the SDQ-I (Marsh, 1988a) while Brounstein et al. (1991) found higher perceptions of appearance for nongifted students with the SDQ-II (Marsh, 1988b).

Moderating Variables

Examining the effect sizes for self-concept and five domains of perceived competence details the degree to which gifted students and nongifted students differ in each domain. Although simple domain differences alone are valuable, additional variables may influence the degree of effect. Thus, this meta-analysis considers eight possible moderator variables: gender, grade, study measure, type of comparison, publication status, method of gifted designation, study year, and participation in gifted programming. The following section describes findings for the variables previously studied. Of the eight moderator variables considered in this study, Hoge and Renzulli (1993) examined four. This section discusses findings for gender, grade level, type of comparison, and measure separately. It also includes the rationale for the inclusion of each variable.

Gender. Research demonstrates that the self-concepts and perceived competencies of males and females differ (Hoge & McSheffrey, 1991; Li, 1988; Shapka & Keating, 2005). In general, girls have higher perceived social competence whereas boys have higher perceived competence in physical domains; however, findings on gender differences are somewhat inconsistent (Shapka & Keating, 2005). The lack of consistent findings and the possibility of gender differences necessitate the examination

of the possible influence of gender on the degree of difference between the self-concepts and perceived competencies of gifted and nongifted students.

In their meta-analysis, Hoge and Renzulli (1993) found a stronger positive overall effect for girls than for boys, suggesting that differences between gifted girls and nongifted girls were greater than those found for gifted boys and nongifted boys. However, the difference (girls had an effect size of .27 and boys had an effect size of .18) was nonsignificant. Some studies have shown gifted girls to have lower global self-concepts than nongifted peers (Kelly & Colangelo, 1984; Schneider, Clegg, Byrne, Ledingham, & Crombie, 1989) while others found no statistically significant gender differences (Brady, 1988; Karnes & Werry, 1981).

Hoge and McSheffrey (1991) compared the global self-concept and domain-specific perceived competencies of 232 gifted children (grades 5-8) with those of a normative sample of 1293 children using the SPPC (Harter, 1985). Within the gifted sample, they found significant gender effects for the Physical Appearance, Behavior Conduct, and Athletic Competence subscales. Boys had higher scores for Physical Appearance and Athletic Competence, whereas girls had higher scores for Behavior Conduct.

Li (1988) examined the self-concepts and perceived competencies of 49 gifted boys and 49 gifted girls using the SPPC (Harter, 1985). She found that gifted girls in grades 4 and 7 had significantly higher perceived academic competence than gifted boys in grades 4 and 7. In contrast, gifted boys in these grades had higher perceptions of appearance than gifted girls. Li (1988) found no significant gender differences for global self-concept or for perceived social, athletic, or behavioral competence.

Grade level. Children become capable of differentiating between more areas of self-concept as they develop (Dixon, 1998; Shapka & Keating, 2005). Thus, grade levels may influence the size of effect in the differences between gifted and nongifted students' self-concepts and perceived competencies. Hoge and Renzulli (1993) found mean weighted effects of .10 for students in grades 1-4, .20 for students in grades 5-8, and .21 for students in grades 9-12. Although these differences were in the predicted direction, they were not statistically significant. Further, 49 of the 69 samples involved students in grades 5-8. The vast majority of studies assessed this middle grade range, making its estimated effect size more stable than the other grade groups.

Li (1988) found that students in the fourth grade had higher perceived appearance and behavioral competence than students in the seventh grade. However, this comparison included both gifted and nongifted students. Thus, it is unclear whether the perceived competencies of gifted students vary with grade or whether differences between the perceived competencies of all students vary by grade.

Type of measure. The self-concept measure used in each study may also hold influence over the degree of difference between gifted and nongifted students' self-concepts and perceived competencies (Hoge & Renzulli, 1993). Self-concept measures use different scales, questions, formats, and may even conceptualize self-concept differently. Consequently, it is important to examine whether these measures produce similar results. Hoge and Renzulli's (1993) meta-analysis included studies using seven different measures. Variability appeared in the mean weighted effect sizes of different measures. However, these differences were not statistically significant. Hoge and Renzulli's (1993) results for type of measure are provided in Table 1.

Table I

Effect Sizes for Different Measures Comparing Gifted and Nongifted Students' Self-Concepts

Measure	*n*	Mean Weighted ES	95% CI
Piers-Harris	4	.41	-.14 to .97
Self-Concept Inventory	3	-.12	-.75 to .52
Self-Description Questionnaire	12	.08	-.22 to .38
Self-Esteem Inventory	5	.13	-.16 to .41
Self Perception Profile for Children or Perceived Competence Scale for Children	31	.18	.05 to .31
Tennessee Self-Concept Scale	12	.36	.24 to .49
Other	2	.13	-.69 to .96

Note. *n* = number of analyses; ES = effect size; CI = confidence interval.

Type of comparison. Within this field of research, researchers create gifted and nongifted student groups differently. They may use groups of regular classroom students or normative samples to identify nongifted students. Gifted students may already be identified as gifted by their schools or researchers may identify students as gifted based on their own criteria. The characteristics of normative samples, groups of regular classroom students, labeled gifted students, and nonlabeled gifted students are likely to differ; thus, the groups used in different studies may influence the degree of effect for each study. Hoge and Renzulli (1993) compared the mean weighted effect sizes of studies by conducting four types of comparisons. This allowed them to compare the degree of effect found for studies using each of the different types of samples. Differences would be expected as those students labeled gifted by their schools should differ from those students not labeled gifted by their schools. Hoge and Renzulli (1993) dropped the mean weighted effect size of the "nonlabeled gifted with norms" comparison from other meta-analysis calculations because only one study used this type of comparison and its results

differed greatly from the results of other comparisons. Hoge and Renzulli's (1993) results are presented in Table 2.

Table II

Effect Sizes for Different Types of Comparisons

Comparison	*n*	Mean weighted ES	95% CI
Labeled gifted with regular students	46	.15	.04 to .25
Nonlabeled gifted with regular students	10	.35	.06 to .64
Labeled gifted with normative groups	12	.17	.02 to .31
Nonlabeled gifted with normative groups	1	.80	N/A

Note. *n* = number of analyses; ES = effect size; CI = confidence interval; regular students = students in the nongifted comparison groups; nonlabeled gifted = students labeled gifted by researchers but not by schools; normative groups = nongifted comparison scores were taken from pre-existing normative data, often from measure manuals

Moderator variables not previously considered. Publication status and year of publication may influence results for two reasons. First, as discussed earlier, often only significant positive findings result in publication. Second, as attitudes towards giftedness change over time (Jackson, 2004), new measures appear, and students experience new types of gifted education, the differences between gifted and nongifted students' self-concepts may also change. The designation methods used to identify gifted students may also influence the extent to which gifted and nongifted students' self-concepts and perceived competencies differ. For example, those students deemed gifted by IQ may differ from those deemed gifted by creativity. Consequently, they may perceive themselves or their abilities differently. Participation in gifted programming may also influence the degree to which gifted and nongifted students' self-concepts and perceived competencies differ. Students spending time away from nongifted peers or doing

different work from their peers because of gifted programming may perceive themselves differently than their gifted counterparts not participating in gifted programming.

Chapter Summary

This chapter provided operational definitions of self-concept, perceived competence, giftedness, and nongiftedness for use throughout the thesis. The literature review introduced research on self-concept and perceived competence, giftedness, and the self-concepts and perceived competencies of gifted students in comparison to those of nongifted students. It reported prior research on moderator variables addressed in the current meta-analysis. This chapter also provided a rationale for this study and described the importance of conducting a new meta-analysis to synthesize findings and examine the possible influence of additional variables. The next chapter will explain the meta-analytic methods for use in this study.

Method

This chapter introduces meta-analysis as a way to synthesize findings of multiple studies and examine moderator variables not generally considered during traditional literature reviews. This chapter discusses advantages and criticisms of meta-analytic methods and explores the appropriateness of using meta-analysis to compare gifted and nongifted students' self-concepts and perceived competencies. It explains procedures for collecting studies, criteria for study inclusion, and both the advantages of and equations required for calculating mean weighted effect sizes. It also includes the procedures for examining the influence of possible moderator variables. This chapter concludes by listing assumptions and limitations of the current meta-analysis.

Meta-Analysis

The current study utilizes meta-analytic methods to synthesize research on gifted students' self-concepts and perceived competencies across multiple studies. "One of the most salient ways to quantitatively synthesize research findings is through a meta-analysis" (Chambers, 2004, p. 35). Gene Glass first introduced meta-analytic methods in 1976 as a means to remove bias in study selection, put to use all information available across studies, and identify statistical relationships between variables using many studies (Kavale & Glass, 1981). Glass (1976) suggested that traditional literature reviews lack the capacity of the meta-analytic approach to accomplish these three goals.

A key problem in research comparing gifted and nongifted students' self-concepts and perceived competencies is that findings are contradictory (Hoge & Renzulli, 1993). Contradictions may be due to the varied definitions of key constructs such as giftedness, self-concept, and perceived competence (Hoge & Renzulli, 1993). Additional reasons for

contradictory research are: (a) sampling error, (b) inconsistent measurement scales, (c) computational errors, (d) typographical errors (e) different samples, and (f) small samples (Hunter & Schmidt, 2004). Hunter and Schmidt (2004) point out that "there are no perfect studies" (p. 18). However, meta-analytic methods help identify inconsistencies by reducing the influence of individual studies over final findings; because meta-analyses use the results of many studies to calculate across-study results, the weight of studies in skewing such results is limited (Hunter & Schmidt, 2004). When significant variability occurs between results, meta-analyses permit researchers to examine the influence of moderator variables.

A literature review is a common approach to summarize findings in well-researched areas. However, standardized procedures are not always used. In contrast, meta-analytic methods make research synthesis a scientific procedure (Cook et al., 1992). Kavale and Glass (1981) explain this statement well, suggesting that "evidence can only be cumulative when there are systematic procedures for accumulating data from disparate studies" (p. 531).

Hunter and Schmidt (2004) suggest that authors of literature reviews in fields with vast quantities of research often have to rely on "best studies" because of the sheer volume they would otherwise have to address. However, researchers often have differing perceptions of what constitutes a "best study" and these differences lead to authors selecting very different studies for inclusion in their literature reviews. Thus, researchers conducting literature reviews on the same topic may arrive at very different conclusions (Hunter & Schmidt, 2004).

One commonly discussed concern about literature reviews is their overdependence on significance tests as indicators of effect. Such reviews often accept hypotheses without considering effect size. Literature reviews can also overlook or misinterpret research findings and lack replicability if procedures are not stated (L. Cohen, Manion, & Morrison, 2000). Meta-analytic procedures help to counteract these issues by using standardized methods to integrate the findings of multiple studies, exposing patterns in the literature without relying on significance tests (Hunter & Schmidt, 2004).

Steps in meta-analytic research. Researchers conducting meta-analyses follow steps similar to those used in primary research. Cook et al. (1992, p. 7-12) suggest using the following steps:

1. Problem formulation
2. Data collection
3. Data retrieval and evaluation
4. Analysis and interpretation
5. Public presentation

Problem formulation involves stating the focus of the review and defining the characteristics of studies to be included. Data collection entails deciding how researchers will find and obtain studies. Data retrieval and evaluation involves applying criteria to determine which studies are “valid” and which are “invalid,” coding information from each study relevant to the review goals, and evaluating the validity and quality of individual studies to select which studies are appropriate for inclusion. Analysis and interpretation entails converting data to a common metric for comparison and using

statistical methods to synthesize the findings of multiple studies in order to address the review's problem.

Advantages of meta-analysis. "A single study will not resolve a major issue. Indeed, a small sample study will not even resolve a minor issue. Thus, the foundation of science is the cumulation of knowledge from the results of many studies" (Hunter & Schmidt, 2004, p. xxvii). Meta-analytic methods provide the means for researchers to synthesize findings.

Meta-analyses that include unpublished research counter publication bias by including unpublished study results in their calculations (Fitz-Gibbon, 1984). In 1986, Coursol and Wagner found that 66% of significant outcome studies were published whereas only 22% of nonsignificant outcome studies were published. They further found that the decision to submit papers for publication related to the outcome of the study; studies with significant outcomes consistent with hypotheses were more prone to submission. When synthesizing research findings, it is important to include unpublished studies because published studies do not adequately represent the outcomes of all studies on a topic. Including only published studies omits studies with neutral or negative outcomes and increases the likelihood of Type I error. Including unpublished studies allows a synthesis that is more representative of the total population of studies in an area (Chambers, 2004).

Researchers use many different instruments to measure self-concept and perceived competence. The use of different measures produces results in different units of measurement and thus, not directly comparable. However, calculating effect sizes for each study creates a common unit of measurement that makes comparisons between

studies possible. Fitz-Gibbon (1984) describes this approach to meta-analysis as examining the degree of found difference rather than examining whether or not effects are statistically significant at selected levels. Relying on arbitrary alpha levels such as 1% or 5% to indicate statistical significance increases the likelihood of Type II error (Lipsey & Wilson, 2001); for instance, a nonsignificant finding with a *p*-value of .06 has a 94% chance that found differences are not attributable to chance. It is quite likely that the tested differences are not due to chance and the hypothesis is incorrectly rejected. In contrast, effect sizes describe changes in dependent variables in terms of degrees of change (L. Cohen, Manion, & Morrison, 2000; Hunter & Schmidt, 2004). Effect sizes do not have cut-off values but rather elucidate differences using a scale whereby .00 indicates no difference and 1.0 indicates a difference of one standard deviation above the mean. Effect sizes in the current meta-analysis measure the difference between the self-concepts and perceived competencies of gifted and nongifted students.

Rarely do studies demonstrate no effect (Asher, 1990; Hunter & Schmidt, 2004). Thus, describing outcomes as dichotomous, as is done with significance tests (there is an effect or there is not an effect) is not as appropriate as reporting the sizes of effects (Hunter & Schmidt, 2004). Simple vote-counting, counting the number of significant versus nonsignficant studies, assumes that a nonsignficant finding indicates no difference; however, few studies actually find zero effect (Asher, 1990; Hunter & Schmidt, 2004). Asher (1990) suggests that including many studies in a vote-counting approach increases the likelihood that the nonsignificant results will outnumber the significant results, thus creating Type II error.

Criticisms of meta-analytic methods. Critics of meta-analytic methods identify publication bias as a serious liability (L. Cohen, Manion, & Morrison, 2000). Publication bias suggests that studies with negative or nonsignificant results are less likely to be published than studies with positive, statistically significant results (Cooper & Hedges, 1994). Although it is true that meta-analyses using only published literature likely miss research with nonsignificant findings (Cooper & Hedges, 1994), this problem also exists for authors of literature reviews. Researchers choosing to include only published studies can address this concern by estimating the number of nonsignificant studies necessary to negate their findings (Chambers, 2004). The current meta-analysis counters the publication bias problem by including both published and unpublished studies.

A second criticism of meta-analytic methods is that many meta-analytic researchers include unpublished research in their analyses. Critics suggest that many studies are unpublished because they do not meet acceptable research standards and their results are not reliable. Although the inclusion of unpublished literature can be problematic if it is not properly screened for quality (Kraemer, Gardner, Brooks, & Yesavage, 1998), the current meta-analysis will include only studies meeting a priori inclusion criteria that are applied to both published and unpublished studies. Further, Glass, McGaw, and Smith (1981) found that the differences in effect sizes between high-validity and low-validity studies are relatively small. Thus, because many studies are included in meta-analyses, the results of high-quality studies should counter any inaccuracies caused by the inclusion of a study of substandard quality.

A third criticism of meta-analytic methods is that statistically combining the data from different designs and measures is similar to comparing “apples and oranges”

(Chambers, 2004). However, others argue that this is the genius of meta-analytic analysis; if homogeneity of results are found despite using different "types of treatments, criteria variables, populations, experimenters, and methods" greater support for construct validity is established (Asher, 1990, p. 149). The current meta-analysis includes studies using different measures of self-concept and perceived competence, allowing examination of whether findings are consistent across measures.

Justification for using meta-analytic methods. Although meta-analysis has critics, meta-analytic methods are appropriate to examine the research questions of this study. As noted above, the current meta-analysis considers and addresses critics' main concerns. First, including unpublished studies ensures that findings represent patterns across the research. Second, studies have to meet inclusion criteria by including specific study information. Third, comparing the effect sizes of studies using different measures examines differences between different scales' results.

Meta-analysis allows the examination of moderator variables such as year of publication, type of measure, and type of publication (Cook et al., 1992). This meta-analysis considers publication status, grade, type of comparison, study year, measure, method of gifted designation, participation in gifted programming, and gender as possible moderating variables. Glass (1976) suggests that meta-analytic methods are beneficial for research topics in which there are many studies and a degree of controversy.

Many studies have examined the self-concepts and perceived competencies of gifted students with unclear results, emphasizing the appropriateness of conducting a meta-analysis (Hoge & Renzulli, 1993). In addition, researchers use many different instruments to measure self-concept and perceived competence. Meta-analysis not only

synthesizes the findings from different measures, it allows comparison of these findings to examine whether these measures truly measure the same construct(s). Since many researchers have compared the self-concepts and perceived competencies of gifted and nongifted students with contradictory results, a meta-analysis is the most appropriate next step in this field of research.

Combining Study Outcomes: Effect Size

Effect sizes measure the extent of difference between two groups. Fitz-Gibbon (1984) describes effect size as the experimental group mean represented by a z-score in the control group distribution. Thus, when comparing gifted and nongifted students, effect sizes demonstrate the mean score of gifted students as a *z*-score in the distribution of nongifted students' self-concept scores. This allows statements such as, "the average gifted student scores higher than approximately XX percent of the nongifted students." Consequently, effect sizes represent the number of standard deviations above or below the sample mean. Jacob Cohen (1992) identifies three levels of effect size:

Table III

Jacob Cohen's (1992) Levels of Effect Size

Effect Size	Level
$.20 \leq d < .50$	small
$.50 \leq d < .80$	medium
$d \geq .80$	large

The main benefit of effect sizes in meta-analysis is that they provide a common metric. The many different measures in the current study, each with its own metric, make comparing raw score differences between gifted and nongifted groups inappropriate. By

calculating effect sizes, studies that examine the same constructs but use different measures become comparable.

Data Collection

Literature search methods. I used psycINFO, Dissertation Abstracts International, and EBSCOhost to identify relevant studies. The search consisted of both published and unpublished studies from 1977 to 2005 that addressed the following research questions:

1. How do the global self-concepts and perceived competencies of gifted students compare to those of nongifted students?
2. Are differences in gifted and nongifted students' global self-concepts and perceived competencies moderated by:
    a. grade
    b. gender
    c. type of comparison
    d. gifted program participation
    e. year of study
    f. publication status
    g. type of measure
    h. method of gifted designation?

A keyword search to locate applicable studies included the keywords "gifted," "self-concept," "self-perception," and "perceived competence." Using synonyms for self-concept helped guarantee finding the largest number of studies examining the research questions. The term "self-esteem" was not used because it refers to the affective view of

oneself (Baumeister, Campbell, Krueger, & Vohs, 2003) while self-concept refers to both affective and evaluative perceptions of oneself (Marsh & Shavelson, 1985a). No synonym was used for "gifted" because this is a commonly used term and is the institutional designation received by gifted students. Keywords were paired in the order shown in Table 4. In addition to database searches, the current study used searches of relevant articles' reference lists to find additional research not found in the databases.

Table IV

Keywords for use in the Literature Search

1st Keyword	2nd Keyword
gifted	self-concept
gifted	self-perception
gifted	perceived competence

Study Inclusion Criteria

After the completion of the database search, each study was examined for inclusion criteria. To be included in the current meta-analysis, studies had to meet the following criteria:

1. The author(s) provide the sizes of gifted and nongifted samples and samples include multiple students.
2. The author(s) include the means and standard deviations of self-concept scores for each gifted and nongifted sample in the study. If this information is not included, the author(s) provide enough information to calculate effect size and pooled standard deviation using equations from Lipsey and Wilson (2001).

3. The author(s) report results for global self-concept and/or at least one domain of perceived competence.
4. The study is in English.

Coding Procedure

Each study was coded for nine variables. These variables are adapted from Hoge and Renzulli (1993) and include:

1. Gender
2. Grade level
3. Type of comparison
4. Method of gifted designation
5. Publication status
6. Year of study
7. Participation in gifted programming
8. Measure
9. Area of self-concept measured

Appendix B provides a table of descriptive information for all studies included in the meta-analysis.

Gender. Comparisons were coded "m" for male only participants, "f" for female only participants, and "c" for studies that combined the results of males and females without differentiation for gender. Subsequently, 28 studies reported results for male groups, 30 studies reported results for female groups, and 27 studies reported results for heterogeneous groups.

Grade. Originally, both grade and age were possible moderator variables. However, few studies reported the ages of participants and the number of studies reporting this information were too small to provide reliable insight. Most studies reported the grade levels of participants, necessitating the use of grade level as the only age-related possible moderator variable.

Many studies reported results for students in groups of grades. In examining data from all included studies, the most common grade groupings were grades 1-4, 5-8, and 9-12. These groups are consistent with Hoge and Renzulli's (1993) groups and they approximate elementary, middle and high school grades. When studies reported results for participants in more than one group (ie; reporting results for students in grades 3-5), the study was coded to the group in which the majority of the sample's students belonged. For instance, one study reported results for students in grades 3-5 so the study was coded as a grades 1-4 group because participants were in two of this group's grades (grade 3 and grade 4). This approach assumes that the results for this group would more adequately describe those of students in grades 1-4 than those of students in grades 5-8.

Type of comparison. Studies were also coded by the type of comparison utilized. Comparison types included labeled gifted students with regular classroom students (coded as GR), nonlabeled gifted students with regular classroom students (NR), labeled gifted students with normative samples (GN), and nonlabeled gifted students with normative samples (NN). For the purposes of the current meta-analysis, labeled gifted students were students identified as gifted by their schools. Nonlabeled gifted students were students identified as gifted by researchers only. Regular students were participants not labeled as gifted (representative of students in a general education classroom). As

well, some researchers compared the self-concepts of gifted students with the normative data provided in test manuals.

Method of gifted designation. The debate over the methods used to designate gifted students suggested that there might be significant differences between students identified using different methods. Methods of designation were placed in one of four categories: (a) students designated by IQ only, (b) students designated using multiple criteria, (c) students designated by IQ or another criterion, or (d) studies for which designation methods were not reported.

Participation in gifted programming. Some studies reported whether gifted students participated in school gifted programming. Few studies reported the type(s) of gifted programming. Studies sorted based on the information provided regarding gifted participants: (a) in gifted programming, (b) not in gifted programming, or (c) gifted participation unknown.

Publication status. Published studies were located in peer-reviewed journals. Unpublished research consisted of dissertations located using Dissertation Abstracts International. When a dissertation and a journal article referred to the same data, the journal article was included in the meta-analysis and the dissertation was not included. This approach prevented bias from including the same data twice; it also screened for study quality by selecting studies subject to the peer-review selection process.

Year of publication. The year of publication for published studies transferred as it appeared in each study. For unpublished studies, this was the year the dissertation was completed. To compare the results of studies from different times, studies were categorized by the decade in which they were published or written.

Measure. During data collection, each measure was assigned a code; for example, Harter's (1985) Self-Perception Profile for Children was "SPPC" and Harter's (1988) Self-Perception Profile for Adolescents was "SPPA." However, there were too many measures to perform separate analyses on each version. The two measures used most often were the Piers-Harris Children's Self-Concept Scale (1984) and Susan Harter's measures for children and adolescents (Harter, 1982, 1985, 1988), which measure both global self-concept and domain-specific perceptions of competence. Thus, the codes for measure were: (a) Piers-Harris, (b) Harter's, or (c) other. Although Harter has three age-specific versions of the Self Perception Profile, they are similar in appearance, approach, and scoring; they were all placed in the Harter category. Results from the six domains examined in the current meta-analysis were recorded and results from additional domains were omitted. Although the literature search did not include the term "self-esteem," some studies used measures like the Coopersmith Self-Esteem Inventory (Coopersmith, 1967) to measure self-concept. These studies were included and meta-analytic results were examined for heterogeneity of effect sizes due to measure.

Domain of self-concept. Each comparison between gifted and nongifted samples was entered as a separate case in an SPSS data file; global self-concept and each domain of perceived competence were entered as separate variables. Variables were "GSC" (global self-concept), "ASC" (perceived academic competence), "BSC" (perceived behavioral competence), "SSC" (perceived social competence), "ATC" (perceived athletic competence), and "PSC" (perceived appearance competence). Studies did not consistently report results for all domains. Variables not included in a comparison were

coded as missing; some cases had data for only one or two variables. Missing variables held no influence over statistical calculations.

Consistent with Harter (1982, 1985, 1988) and Hoge and Renzulli (1993), the six domains addressed in the current meta-analysis are global self-concept and perceived academic, behavioral, social, athletic, and appearance competencies (note that Hoge and Renzulli combined the athletic and appearance domains into one physical domain). Some measures use different labels for similar constructs. In this meta-analysis, measures originally included in Hoge and Renzulli's (1993) meta-analysis were assigned the same domain labels as with Hoge and Renzulli. New measures using different labels were categorized into Harter's (1985) subscale categories. For example, a measure that refers to "scholastic" self-concept was placed with the perceived academic competence scales.

To ensure that labels used by new measures were placed with the appropriate Harter (1985) subscale, a panel of three graduate students was asked to categorize new subscales using Harter's labels. The current meta-analysis used those subscale categorizations about which two or more students agreed. If the panel did not agree on the categorization for a subscale, the subscale was omitted.

Meta-Analytic Procedures

Categorical variables. In order to proceed with statistical calculations, possible moderator variables needed to be categorical. Numerical values were assigned to each coded response. The values assigned are insignificant; they serve only to create categories of responses examinable using statistical software. Thus, a category assigned a numerical value of 1 holds no more or less importance than a category assigned a numerical value of 2.

Calculating a common metric: Effect size. Effect sizes were calculated using Hunter and Schmidt's (2004) equation to compare gifted and nongifted groups:

$$d = \frac{X_1 - X_2}{SDp} \quad (1)$$

where *SDp* is the pooled standard deviation of the two groups as determined by the following equation from Gall, Gall, and Borg (2005):

$$SDp^2 = \frac{\left(N_{X_1} - 1\right)Se^2 + \left(N_{X_2} - 1\right)Sc^2}{\left(N_{X_1} + N_{X_2} - 2\right)} \quad (2)$$

The pooled standard deviation was used in place of the standard deviation of one of the groups because it is representative of the standard deviations of both groups and it controls for differences in sample sizes between the compared groups (Gall, Gall, & Borg, 2005). An alternative is to use the standard deviation of the control groups; however, the pooled standard deviation provides a better estimate of the population standard deviation (Rosenthal, 1994).

Lipsey and Wilson (2001) propose that Hedges' *g* statistic is an appropriate measure in meta-analysis because it accounts for studies with small sample sizes. They suggest that studies with small sample sizes have upward biases. By using Hedges' correction, such biases are countered. These values were calculated using the following equation:

$$g = d\left[1 - \frac{3}{4N - 9}\right] \quad (3)$$

These values are the effect size statistics used in all subsequent calculations.

Treatment of the data. Effect sizes were calculated for each comparison between gifted and nongifted students in each domain (global, academic, behavioral, social, athletic, and appearance). Thus, studies comparing gifted and nongifted samples in each domain resulted in six independent effect sizes. Appendix C includes the unweighted effect sizes for each comparison.

Mean unweighted effect sizes were then calculated for each domain by adding together all effect sizes for the domain and dividing by *n*, the number of effect sizes. However, mean unweighted effect sizes are subject to bias from studies with little power (Hedges & Olkin, 1985; Lipsey & Wilson, 2001). Using mean weighted effect size "is appropriate because larger samples give a more reliable estimate of population parameters" (Elbaum, 2002, p. 219). Thus, the next step was to calculate mean weighted effect sizes for each domain of self-concept.

The first step in calculating mean weighted effect sizes is to calculate inverse variance weights. Although it is possible to weight each effect size by its sample size, the optimal method of weighting is to use inverse variance weights (Hedges & Olkin, 1985; Lipsey & Wilson, 2001). The inverse variance weight, w_i, is the inverse of the standard error for each effect size (standard error is an indicator of effect size precision):

$$w_i = \frac{1}{\sqrt{\frac{n_1 + n_2}{n_1 n_2} + \frac{\overline{ES}_{sm}}{2(n_1 + n_2)}}} \quad (4)$$

where $\overline{ES}_{sm}$ is the standardized mean difference (the two means over the pooled standard deviation.

In accordance with Lipsey and Wilson's (2001) recommended procedures, the following calculations were made using SPSS command language:

1. $w_i \times ES_i = wes_i$ (5)

2. $w_i \times ES_i^2 = wessq_i$ (6)

3. $w_i^2 = wsq_i$ (7)

where ES_i is the individual effect size and w_i is the individual inverse variance weight. The mean weighted effect size, $\overline{ES}$, is calculated as:

$$\overline{ES} = \frac{\sum wes_i}{\sum w_i} \quad (8)$$

where wes_i is the individual weighted effect size and w_i is the inverse variance weight for effect size *i*. Six sets of meta-analytic calculations were performed to examine the effect sizes for each domain separately. The number of calculations required in analyses increases the likelihood of calculation errors. To prevent such errors, Lipsey and Wilson's (2001) SPSS macro for calculating meta-analytic summary statistics was utilized. The results of Equations (6) and (7) were necessary for macro calculations. Macro output for each domain is included in Appendix D.

The macro results provide information regarding the statistical significance of mean weighted effect sizes using 95% confidence intervals. A statistically significant confidence interval indicates that the mean weighted effect size is a relatively strong estimate of the degree of difference between the self-concepts and perceived

competencies of gifted and nongifted students. The macro also provides information to conduct an examination of homogeneity for each domain.

If *Q*, the homogeneity statistic, is statistically significant, homogeneity of findings across studies is rejected. This indicates greater variability between effect sizes than expected from sampling error alone (Lipsey & Wilson, 2001), suggesting that a single mean weighted effect size is not a strong depiction of the effect size distribution for that domain. If *Q* is not statistically significant, homogeneity is accepted, indicating that variability between effect sizes fits with that expected from sampling error. Statistically significant homogeneity statistics suggest that moderator variables may influence the effect sizes. The formula for *Q* is:

$$Q = w_i(ES_i - \overline{ES})^2 \quad (9)$$

where ES_i is the individual effect size, $\overline{ES}$ is the mean weighted effect size over *k* effect sizes, and w_i is the individual weight for ES_i (Lipsey & Wilson, 2001).

Q is evaluated using critical values for Chi-Square when:

$$df = k - 1 \quad (10)$$

Moderator variables were considered for those domains in which the mean weighted effect sizes lead to statistically significant homogeneity statistics. Thus, for each domain with a statistically significant *Q* statistic, an analog to the analysis of variance (ANOVA) was calculated to examine differences between the groups of each predetermined moderator variable (Lipsey & Wilson, 2001). Moderator variables are statistically significant if Q_B, the degree of difference between the variable's groups, is significant at a predetermined alpha level. The formula for Q_B is:

$$Q_B = \sum w_j \overline{ES}_j^2 - \frac{\left(\sum w_j \overline{ES}_j\right)^2}{\sum w_j} \quad (11)$$

where Q_B is the *Q* between groups, $\overline{ES}_j$ is the mean weighted effect size for each group, w_j is the sum of the weights in each group, and *j* equals the group number (Lipsey & Wilson, 2001). Lipsey and Wilson's (2001) SPSS macro, MetaF, for the ANOVA analog was utilized to prevent calculation errors. A statistically significant Q_B indicates that the distribution of mean weighted effect sizes in a domain is subject to the influence of the variable under consideration. This procedure identifies whether statistically significant differences between self-concept or perceived competence results of studies are accounted for by the use of different measures, the grades of participants, etc.

Study Limitations and Assumptions

This meta-analysis makes several assumptions:

1. The measures used to measure self-concept and perceived competence accurately measure and differentiate among different domains.
2. The studies included in this meta-analysis provide accurate results.
3. The studies included in this meta-analysis are of acceptable quality.
4. Although the samples included in this meta-analysis are from different countries, this study assumes that the self-concepts and perceived competencies of gifted students from different countries are similar, making it appropriate to group gifted students from different geographic locations.

5. The samples of gifted and nongifted students are gifted and nongifted; individuals are properly identified.

The current meta-analysis has three main limitations. First is the possible inaccessibility of literature. Although this researcher made every attempt to locate and consider all research comparing gifted students' global self-concepts and perceived competencies with those of nongifted students, it is likely that some studies were not located. Thus, some findings may not be included in the meta-analysis.

A second limitation is that some studies did not include the information necessary for inclusion in the current meta-analysis. Although a study may be of high quality, it cannot be used if it does not provide the required information. Third, this meta-analysis is limited because the studies included used very different samples. For example, the appropriateness of comparing samples from rural and urban areas, North America and Europe, private and public schools, etc. is unknown. Unfortunately, limited reporting of such information made examination of its influence impossible. It is arguable that this wide array of samples is actually a strength of the study but it should also be listed as a possible limitation because it could influence the degree of difference between gifted and nongifted students' global self-concepts or perceived competencies.

Chapter Summary

This chapter introduced meta-analysis as a way to synthesize findings of multiple studies and examine moderator variables not generally considered during traditional literature reviews. This chapter discussed advantages and criticisms of meta-analytic methods and justified the use of meta-analysis for this area of study. It outlined procedures for collecting studies, criteria for study inclusion, and both the advantages of

and equations required to calculate mean weighted effect sizes. This chapter concluded by listing assumptions and limitations of this study. The next chapter reports the results of the current meta-analysis.

Results

Description of Studies and Effect Sizes Included in the Meta-Analysis

Thirty-seven studies were included in the meta-analysis (Appendices A and B). These studies included eight unpublished dissertations and 29 studies published in peer-reviewed journals. Included studies ranged in year from 1978 to 2004. Some studies included comparisons of gifted and nongifted groups with results reported independently for multiple genders or age groups. Each two-way comparison is a separate case in the current meta-analysis because such comparisons have independent samples. Thus, many studies provided multiple comparisons (Appendix C shows unweighted effect sizes for each case). However, the results of only one comparison were recorded when authors used a control group or gifted group more than once (for example, comparing multiple groups of gifted students with one group of nongifted students). In the current meta-analysis, one comparison was selected randomly to ensure sample independence.

These 37 selected studies yielded 98 comparisons between gifted and nongifted students. Many studies included data comparing gifted and nongifted students in multiple domains. The number of effect sizes found for individual domains ranged from 34 to 85. Across the studies, the total gifted sample sizes for each domain ranged from 590 for perceived behavioral competence to 3,092 for global self-concept. Gifted student samples ranged from 4 to 498 participants (M = 46, SD = 81). The sample sizes of nongifted and normative groups ranged from 4 to 393 (M = 42, SD = 51). In order to prevent disproportionate influence by studies using large normative samples (which may include some gifted students), these nongifted sample sizes were adjusted to the sample sizes of the gifted comparison groups. Table 5 shows descriptive information for each domain of

self-concept, including the range of effect size scores for each domain and mean unweighted effect sizes.

Table V

Descriptive Statistics for Effect Sizes Prior to Analyses

Domain	# of Effect Sizes	Gifted Sample N	Range	Mean Unweighted ES
Global	85	3,092	-.94 to 1.15	.14
Academic	74	2,883	-.89 to 3.12	.59
Social	40	1,750	-.77 to .79	.09
Athletic	38	1,146	-1.49 to .91	-.19
Behavior	34	590	-.69 to 1.72	.37
Appearance	37	979	-.92 to .81	-.05

Outlier effect sizes were identified as individual effect sizes more than 2.5 standard deviations from the mean (Bear, Minke, & Manning, 2002). The global, social, and behavioral self-concept domains had no outliers. The appearance domain had four outliers and the academic and appearance domains each had two (see Figure 2). Studies with outliers were excluded from further calculations in the domain for which they had outliers.

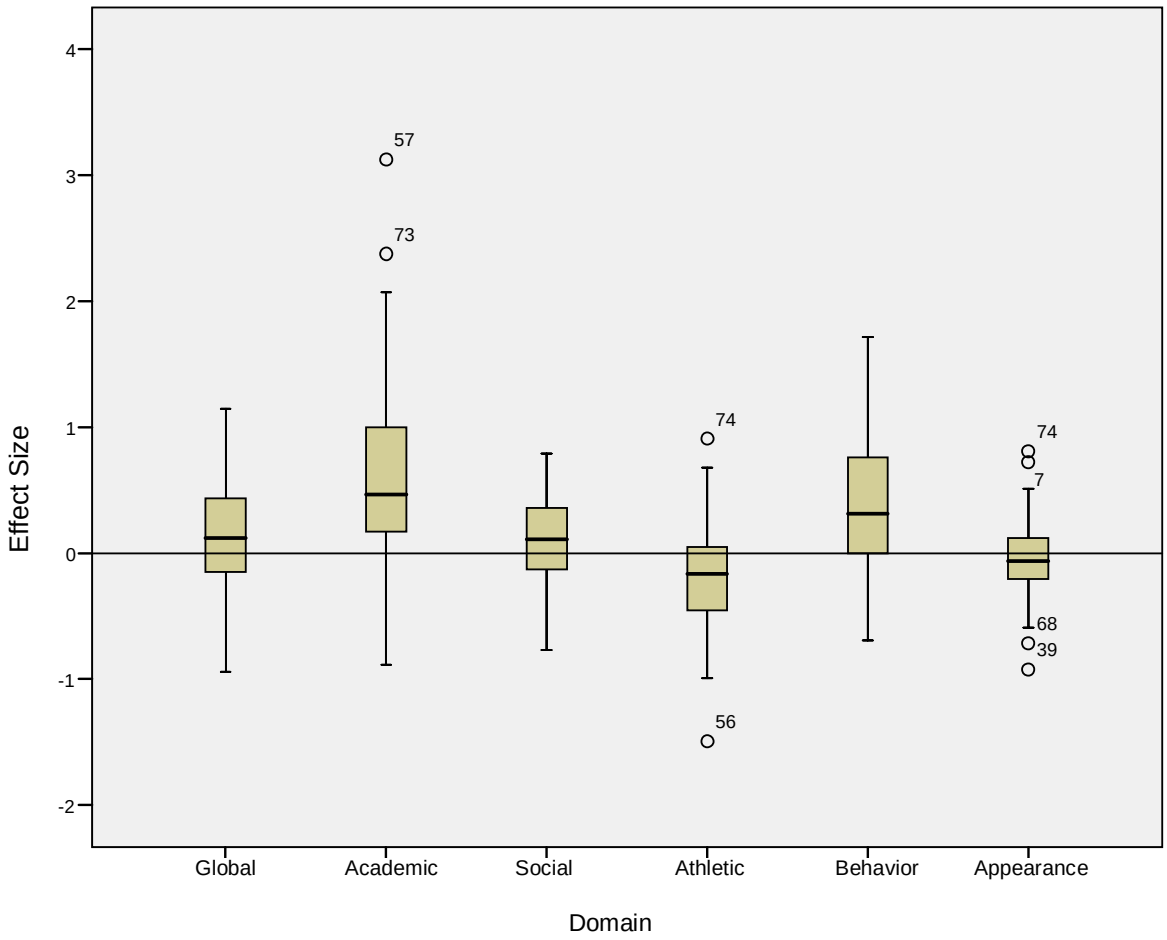

Figure 2. Unweighted effect sizes for each domain.

Table 6 displays descriptive statistics for the mean unweighted effect sizes after omitting outliers from the academic, athletic, and appearance domains of perceived competence. Outliers were excluded from all subsequent calculations.

Table VI

Descriptive Statistics for Effect Sizes After Omitting Outlying Cases

Domain	# of Effect Sizes	Gifted Sample N	Range
Global	85	3,092	-.94 to 1.15
Academic	72	2,849	-.89 to 2.07
Social	40	1,750	-.77 to .79
Athletic	36	1,106	-.99 to .68
Behavior	34	590	-.69 to 1.72
Appearance	33	916	-.59 to .51

Note. ES = effect size.

Mean unweighted effect sizes are subject to bias (Hedges & Olkin, 1985; Lipsey & Wilson, 2001); best meta-analytic practice is to calculate mean effect size weighted by sample size (Elbaum, 2002). Subsequent analyses involved only the mean weighted effect size because it is the more reliable estimate (Hedges & Olkin, 1985). The output of Lipsey and Wilson's (2001) MeanES SPSS macro for global self-concept and each domain of perceived competence is provided in Appendix D. Table 7 lists mean unweighted and mean weighted effect sizes for each domain. Slight differences exist between the two sets of results. For reference, Hoge and Renzulli's (1993) results are also included in Table 7. Results from both the current and the prior meta-analyses show similar trends. Gifted students have higher scores than their nongifted peers in the global, academic, social, and behavior domains; they have lower perceived competence than nongifted students in the physical (appearance and athletic) domains.

Table VII

Mean Effect Sizes

Domain	Mean Unweighted ES	Mean Weighted ES	Prior Meta-Analytic Mean Weighted ES*
Global	.14	.12	.19
Academic	.59	.47	.47
Social	.09	.07	.02
Athletic	-.19	-.24	-.08[a]
Behavior	.37	.28	.37
Appearance	-.05	-.16	-.08[a]

*Results from Hoge and Renzulli's (1993) meta-analysis

[a] Hoge and Renzulli's physical domain results are listed for both the athletic and appearance domains because these domains were not differentiated in their meta-analysis

Analyses of mean weighted effect sizes show that gifted students have significantly higher global self-concept and higher academic, behavioral, and social perceived competencies than their nongifted counterparts. In Table 8, despite ranges of up to .21, confidence interval ranges are either all positive or all negative for individual domains. Thus, results are consistent in the six domains (Lipsey & Wilson, 2001). All mean weighted effect sizes are statistically significant ($p = .05$).

Table VIII

Analyses of Mean Weighted Effect Sizes

SC Domain	Mean Weighted ES	95% CI	*Q*
Global	.12 [a]	.06 to .17	143.85 [b]
Academic[c]	.47 [a]	.41 to .53	295.13 [b]
Social	.07 [a]	.00 to .14	60.94
Athletic[c]	-.24 [a]	-.33 to -.15	49.91
Behavior	.28 [a]	.17 to .39	52.83 [b]
Appearance[c]	-.16 [a]	-.26 to -.06	28.92

[a] Mean weighted ES is significant at $p = .05$

[b] Hypothesis of homogeneity is rejected at $p = .01$

[c] Outliers omitted from results

Moderator Effects

The acceptance of homogeneity in social, athletic, and appearance perceived competencies suggests that the mean weighted effect size sufficiently describes the distribution of effect sizes for these domains (Lipsey & Wilson, 2001). However, the rejection of homogeneity for the global, academic, and behavioral domains suggests that variation in these mean weighted effect sizes may be caused by moderator variables (Bear, Minke, & Manning, 2002). Table 9 lists statistically significant Q_B values from Lipsey and Wilson's (2001) MetaF macro. A sample output from this macro is located in Appendix E. Consistent with the approach of Bear, Minke, and Manning (2002), subcategories for possible moderator variables with less than four effect sizes are excluded from analyses in order to provide reliable results.

Table IX

Moderator Variables

Moderator Variable	Academic[a]	Behavioral	Global
Study Year	*		
Publication Status	*		
Measure	*	*	
Gender	*		
Grade	*	*	
Comparison Type	--	--	--
Designation Method	*		
In Gifted Programming		--	

* Q_B is statistically significant, $p < .05$

-- Not enough effect sizes per category for calculation

[a] Outliers omitted from results

Perceived academic competence and moderator variables. Except for the type of comparison and gifted programming, all moderator variables hold significant influence over the degree of difference between gifted and nongifted students' perceived academic competence. There are statistically significant differences in the academic domain across

six moderator variables. Gifted students have significantly higher perceptions of academic competence than nongifted students for each subcategory except studies conducted between 1970 and 1979. Overall, gifted students perceive their academic abilities higher than their nongifted peers. The significance of six moderator variables indicates that the degree of difference between gifted and nongifted students' perceived academic competence is influenced by additional factors.

Year of publication was a significant moderator of the difference between gifted and nongifted student's perceived academic competence. In particular, there was significant disparity in effect sizes of studies from different decades (Q_B = 24.86, p < .05). Studies from the 1970s showed no significant differences between gifted and nongifted students perceived academic competence; however, studies from the 1980s and 1990s showed medium effect sizes for perceived academic competence, indicating substantial differences between the gifted and nongifted samples. There were not enough studies from 2000 to 2005 to examine the results for this period reliably.

Publication status was a significant moderator of differences between gifted and nongifted student's perceived academic competence. There were significant differences between the effect sizes of published and unpublished studies (Q_B = 10.43, p < .05). Published studies (*mwes* = .52) had larger effect sizes than unpublished studies (*mwes* = .30).

Gender also moderated the differences in gifted and nongifted students' perceived academic competence (Q_B = 6.24, p < .05). Studies comparing only males showed a small mean weighted effect (*mwes* = .35); studies comparing only females showed a

slightly larger mean weighted effect size (*mwes* = .44). Studies using samples of both genders showed a medium effect size (*mwes* = .53).

Measure was also a significant moderator of the differences between gifted and nongifted students' perceived academic competence. The particular measure utilized accounted for a significant amount of the variability in effect sizes (Q_B = 14.92, $p < .05$). Studies using the Piers-Harris Children's Self-Concept Scale (1984) showed smaller differences between gifted and nongifted students' perceived academic competence (*mwes* = .24) than studies using Harter's measure (*mwes* = .48) or other measures (*mwes* = .55).

Grade level was a significant moderator of differences in gifted and nongifted students' perceived academic competence (Q_B = 44.03, $p < .05$). Differences between perceptions of academic competence of gifted and nongifted students strengthened as grade level increased. Studies comparing elementary students showed a mean weighted effect size of only .17; however, gifted high school students had much higher perceived academic competence than the nongifted students (*mwes* = .70).

The method of gifted designation also moderated the extent to which gifted and nongifted students' perceived academic competence differed (Q_B = 8.84, $p < .05$). Insufficient numbers of studies used IQ only to evaluate this designation method reliably. Studies using multiple criteria to designate gifted students showed a medium mean weighted effect size (*mwes* = .51), as did studies for which researchers did not report designation methods (*mwes* = .53).

Table X

Moderator Variable Results for Perceived Academic Competence

Moderator Variable and Subcategories	Q_B	*MWES*	*n*	95% CI for *MWES*
Publication Year	24.86*			
1970-1979		.00	12	-.18 to .18
1980-1989		.48**	48	.39 to .57
1990-1999		.50**	10	.41 to .59
2000-2005		--	--	--
Publication Status	10.43*			
Published		.52**	38	.46 to .59
Unpublished		.30**	34	.18 to .42
Gender	6.24*			
Male		.35**	25	.22 to .47
Female		.44**	24	.32 to .56
Combined		.53**	23	.45 to .60
Measure	14.12*			
PH		.24**	22	.11 to .38
Harter		.48**	30	.39 to .57
Other		.55**	20	.47 to .64
Grade	44.03*			
1-4		.17**	17	.06 to .27
5-8		.55**	43	.48 to .63
9-12		.70**	11	.55 to .84
Comparison Type	--	--	--	--
Designation Method	8.84*			
IQ only		--	--	--
Multiple Criteria		.51**	19	.41 to .60
Unknown		.53**	35	.44 to .62
IQ or Other		.31**	16	.18 to .43
Gifted Programming	.31			
In school gifted program		.41**	59	.34 to .48
Unknown		--	--	--
Not in program		.35**	8	.15 to .55
Out of school program		--	--	--

*Statistically significant differences between groups, $p < .05$

**Statistically significant effect sizes (statistically significant differences between gifted and nongifted student samples in this subcategory), $p < .05$

-- Not enough effect sizes per group to complete calculations

Global self-concept and moderator variables. None of the moderator variables examined in the current meta-analysis accounted for systematic differences in the global self-concept domain. However, multiple categories had only one or two subcategories with statistically significant differences between gifted and nongifted students' global self-concepts. Studies from the 1970s had no significant differences in global self-concept; however, there were significant differences between studies from the 1980s (*mwes* = .13) and 1990s (*mwes* = .12). Unpublished studies showed no differences, but published studies showed significant differences between gifted and nongifted students. Of the three gender subcategories (male, female, and combined), only the gifted females' self-concepts differed significantly from their nongifted counterparts (*mwes* = .20).

Studies using measures other than the Piers-Harris Children's Self-Concept Scale (1984) showed statistically significant differences between gifted and nongifted students' global self-concepts. Studies using the Piers-Harris (1984) measure showed no significant differences between the groups. The only grade level with significant differences between gifted and nongifted samples was the grades 5-8 group (*mwes* = .17). There were also significant differences between the global self-concepts of gifted and nongifted students in studies designating students by either multiple criteria (*mwes* = .14) or a choice of IQ or another criterion (*mwes* = .19). Studies in which gifted students were either enrolled in school gifted programming or their gifted programming status was unreported showed that gifted students have significantly higher global self-concepts than their nongifted peers (.13 and .25, respectively).

Table XI

Moderator Variable Results for Global Self-Concept

Moderator Variable and Subcategories	Q_B	*MWES*	*n*	95% CI for *MWES*
Publication Year	3.31			
1970-1979		-.04	13	-.21 to .13
1980-1989		.13**	57	.06 to .20
1990-1999		.12**	14	.02 to .21
2000-2005				
Publication Status	1.22			
Published		.13**	50	.07 to .19
Unpublished		.06	35	-.06 to .18
Gender	4.04			
Male		.08	28	-.03 to .18
Female		.20**	30	.10 to .30
Combined		.08	27	-.01 to .16
Measure	3.84			
PH		.03	32	-.08 to .13
Harter		.16**	31	.07 to .25
Other		.14**	22	.05 to .23
Grade	3.16			
Grades 1-4		.07	20	-.04 to .18
Grades 5-8		.17**	53	.09 to .24
Grades 9-12		.02	9	-.19 to .23
Comparison Type	--	--	--	--
Designation Method	6.76			
IQ		-.13	6	-.36 to .09
Multiple Criteria		.14*	26	.04 to .23
Unknown		.09	35	.00 to .18
IQ or Other		.19*	18	.08 to .30
Gifted Programming	4.47			
In school gifted program		.13*	67	.07 to .20
Unknown		.25*	7	.12 to .38
Not in program		.02	8	-.17 to .20
In out of school program		--	--	--

*Statistically significant differences between groups, $p < .05$

**Statistically significant effect sizes (statistically significant differences between gifted and nongifted student samples in this subcategory), $p < .05$

-- Not enough effect sizes per group to complete calculations

Perceived behavioral competence and moderator variables. The differences between gifted and nongifted students' perceived behavioral competence varied significantly by school grade (Q_B = 18.24 , p < .05) and measure (Q_B = 13.51, p < .05). Gifted students had significantly higher perceived behavioral competence than nongifted students. There were no significant differences between subcategories for the following moderator variables: (a) the decade of the study, (b) published and unpublished studies, (c) gender, or (d) the method of gifted designation. However, all subcategories for these variables resulted in statistically significant differences between gifted and nongifted students' perceived behavioral competence.

Measure was a significant moderator of the differences between the perceived behavioral competence of gifted and nongifted students (Q_B = 13.51, p < .05). The majority of studies examining perceived behavioral competence used either the Piers-Harris Children's Self-Concept Scale (1984) or one of Susan Harter's three perceived competence measures (1982, 1985, 1988). There were no statistically significant differences between gifted and nongifted students for those studies using the Piers-Harris scale (1984) or scales other than the three Harter measures. However, studies using Harter's (1982, 1985, 1988) measures showed large differences between gifted and nongifted students' perceived behavioral competence (*mwes* = .60).

Grade level was also a significant moderator of the differences between gifted and nongifted students' perceived behavioral competence (Q_B = 18.24, p < .05). Gifted students in grades 1-4 did not have significantly different perceived behavioral competence than nongifted students in the same grades. There was a large spike in mean

weighted effect size for the grades 5-8 group (*mwes* = .44). However, this difference decreased in high school where there are no longer any significant differences.

Table XII

Moderator Variable Results for Perceived Behavioral Competence

Moderator Variable and Subcategories	Q_B	*MWES*	*n*	95% CI for *MWES*
Study Year	.11			
1970-1979		--	--	--
1980-1989		.27**	29	.15 to .40
1990-1999		.32**	5	.08 to .55
2000-2005		--	--	--
Publication Status	.01			
Published		.28**	12	.12 to .43
Unpublished		.29**	22	.13 to .45
Gender	.23			
Male		.33**	11	.12 to .54
Female		.27**	9	.06 to .48
Combined		.26**	14	.09 to .43
Measure	13.51*			
PH		.13	14	-.05 to .30
Harter		.60**	16	.40 to 80
Other		.17	4	-.04 to .39
Grade	18.24*			
Grades 1-4		.09	7	-.19 to .36
Grades 5-8		.44**	21	.30 to .58
Grades 9-12		-.26	5	-.58 to .06
Comparison Type	--	--	--	--
Designation Method	.57			
IQ Only		--	--	--
Multiple Criteria		.27**	11	.06 to .47
Unknown		.37**	17	.18 to .55
IQ or Other		.28**	4	.07 to .50
Gifted Programming	--	--	--	--

*Statistically significant differences between groups, $p = .05$

**Statistically significant effect sizes (statistically significant differences between gifted and nongifted student samples in this subcategory), $p = .05$

-- Not enough effect sizes per group to complete calculations

Chapter Summary

This chapter reported results of the current meta-analysis. The chapter included descriptive statistics on the studies selected for each domain. It reported results from each meta-analytic step, including the mean unweighted effect sizes, the identification and omission of outliers, and the mean weighted effect sizes for global self-concept and each domain of perceived competence. This chapter included the procedure for analyzing the homogeneity of weighted effect sizes and the results of the three heterogeneous domains for each moderator variable considered. Equations required for each meta-analytic calculation were provided. The next chapter includes discussion of the results and suggestions for future research.

Discussion

The current meta-analysis explored two research questions: (1) How do the self-concepts and perceived competencies of gifted students compare with those of nongifted students and (2) Are there systematic variations in such differences that are best accounted for by moderator variables?

There are statistically significant differences between the global self-concept and the perceived academic, social, behavioral, athletic, and appearance competencies of gifted and nongifted students; gifted status influences how students view and evaluate themselves. Gifted students have higher global self-concept and perceived academic, behavioral, and social competencies than nongifted students. Gifted students have lower perceived appearance and athletic competence than nongifted students (the two physical domains). These results are consistent with Hoge and Renzulli's (1993) findings. However, whereas Hoge and Renzulli's meta-analysis included only 15 studies, the current meta-analysis incorporated results from 37 studies. Further, while Hoge and Renzulli (1993) created one "physical" domain in their meta-analysis, the current meta-analysis maintained independent perceived appearance competence and perceived athletic competence domains. Thus, the current meta-analysis provides additional information about how gifted students perceive their looks and athletic abilities.

The extent to which gifted and nongifted students' global self-concepts and perceived competencies differ varies by domain. These differences support the hypothesis that self-concept is "composed of a set of relatively independent dimensions" (Hoge & Renzulli, 1993, p. 458). The largest effect size is the result of comparing gifted and nongifted students' perceived academic competence (*mwes* = .47). This is expected

because students were grouped by their academic ability or potential. Gifted students also demonstrate significantly higher perceived behavioral competence (*mwes* = .28). It may be that gifted students feel that good behavior is associated with strong academics; additional research on why gifted students rate their behavior so high is required. Gifted students also have higher global self-concept (*mwes* = .12) and perceived social competence (*mwes* = .07). However, the positive effects in the global and social domains, although statistically significant, are particularly diminutive. Cohen (1992) identifies a small effect as one greater than .20. Thus, these results show that, regardless of significance, gifted students do not have deficits in these domains.

The current meta-analysis examined the influence of moderator variables for domains showing heterogeneous effect sizes. Hoge and Renzulli (1993) did not find any significant effects for type of measure, gender, type of comparison, or grade level. This may be because they combined effect sizes from all self-concept domains instead of examining the role of moderator variables in independent domains. Examining domains independently permits closer analysis of the differences between gifted and nongifted students' global self-concepts and perceived competencies. Differences between gifted and nongifted students' perceived social, appearance, and athletic competencies are best accounted for by students' gifted status. The variation between effect sizes in these domains is approximately that expected by sampling error. However, there are significant systematic variations between effect sizes in the global, academic, and behavioral domains. Results from the current meta-analysis reveal that moderator variables hold significant influence on the degree of difference between gifted and nongifted students' perceived academic and behavioral competencies.

Grade level significantly moderates the differences between gifted and nongifted students' perceived academic and behavioral competencies. Thus, it appears that some areas of perceived competence are subject to developmental trends (Harter, 1999; Shapka & Keating, 2005). Social comparison theory suggests that students compare themselves with others (Festinger, 1954). As students age, they better differentiate between their own abilities and those of their peers (Harter, 1999). Children become capable of better differentiating between more areas of self-concept and perceived competence as they develop (Dixon, 1998; Shapka & Keating, 2005). Academically, the differences between gifted and nongifted students' perceived competence increased with grade level group, increasing from a mean weighted effect size of .17 in grades 1-4 to a mean weighted effect size of .70 in grades 9-12. This is consistent with the research suggesting that students' abilities to assess their own abilities improve as they develop (Harter, 1999; Shapka & Keating, 2005). Gifted and nongifted students are better able to compare their academic competence with that of their peers, leading to larger differences in the perceived competencies of these groups.

The perceived behavioral competence differences increased between grades 1-4 and grades 5-8 but decreased by grades 9-12. Academically, gifted students perceive themselves differently than their peers throughout their school years and these differences strengthen as they continue their educations and are better able to compare their own abilities with those of their peers. However, they begin to view themselves similarly to their peers in the behavioral domain as they progress in school. It is unclear whether nongifted students' perceived behavioral competence is higher than that of gifted students because the nongifted groups' perceived competence increases or because the gifted

groups' perceived competence lowers. Additional research would be beneficial to clarify whether gifted students' perceived behavioral competence decreases in adolescence or whether nongifted students are simply "catching up" to their nongifted peers' perceptions in this domain.

The moderator variables considered in the current meta-analysis do not account for differences between gifted and nongifted students' global self-concepts. Global self-concept is a broad construct and may be subject to influence from combinations of confounding variables. Although some measures were designed to measure self-esteem and others to measure self-concept, results from the Piers-Harris, Harter, and other measures were consistent. For all measures, differences between gifted and nongifted students' global self-concepts were smaller than Cohen's (1992) small effect designation. The consistent results suggest that the constructs of global self-concept and self-esteem, as assessed by the included measures, are similar.

In contrast to global self-concept, almost every moderator variable accounted for significant variation in perceived academic competence effect sizes and gifted students had higher perceived academic competence in all but one comparison (see Table 9). This is relatively predictable because student groups were generally identified by academic ability or potential. Gifted students perceive their abilities higher in areas that involve their intelligence and reasoning abilities (global, academic, social, and behavioral). In contrast, they perceive their abilities lower in the more physical appearance and athletic domains.

The decade in which studies were published or written significantly moderates the differences between gifted and nongifted students' perceived academic competencies.

Studies from the 1970s showed no differences; however, studies from the 1980s and 1990s showed similar medium degrees of difference (*mwes* = .48 and *mwes* = .50, respectively). This may be due to the creation of more perceived competence measures during the 1980s. The 13 comparisons from the 1970s came from only two studies and nine of these comparisons used the Piers-Harris (Piers, 1984) measure. In the 1980s, many self-concept and perceived competence measures were created. After the publication of Harter's perceived competence measures (Harter, 1982, 1985, 1988), fewer studies used the Piers-Harris (Piers, 1984) measure and many used either Harter's or other new measures. It should be noted that the Piers-Harris measure has been revised since its creation; the studies from the 1970s would have used the older version while more recent studies would used the more current version.

In the global, behavioral, and academic domains, studies using the Piers-Harris (Piers, 1984) resulted in smaller mean weighted effect sizes than studies using Harter's measures (Harter, 1982, 1985, 1988). This is important because these were the most common measures researchers chose to measure self-concept and perceived competence. It may be that these two measures assess slightly different constructs. Indeed, the Piers-Harris (Piers, 1984) subscales are descriptive rather than evaluative. Perceived competence and self-concept involve evaluative components and thus the appropriateness of researchers using this measure to assess perceived competence is in need of further exploration.

Although measure accounts for significant variance in effect sizes for perceived academic and behavioral competence, results from the three categories of measures (Piers-Harris, Harter, and Other) are directionally consistent. However, the most drastic

difference between measures is the significant difference between perceived behavioral competence effect sizes from Harter's (1982, 1985, 1988) measures and those from other measures. Comparisons of gifted and nongifted students' perceived behavioral competencies using Harter's (1982, 1985, 1988) measures resulted in a medium mean weighted effect size (*mwes* = .60) while comparisons using the Piers-Harris (Piers, 1984) measure or alternatives resulted in substantially smaller differences (*mwes* = .13 and *mwes* = .17). Thus, it appears that Harter's measures may evaluate a different aspect of perceived behavioral competence than the other measures.

Gifted students have lower perceived appearance and athletic competencies than their nongifted peers. However, the effects are very small (-.16 and -.24 respectively). Lower than average perceived appearance and athletic competencies may limit the activities in which gifted students choose to participate. Further, low perceived competencies are associated with emotional problems and poor adaptation to surroundings (Ablard, 1997; Miserandino, 1996). The relatively small disadvantage of gifted students in these areas suggest that researching programs focused on physical self-image may be beneficial as a preventative measure rather than an intervention but that gifted students are not at significant risk for problems.

Next Steps in Research

Gifted students have higher self-perceptions than nongifted students in four of six domains. Because gifted students have lower perceived competence than nongifted students in the appearance and athletic domains, a next step in research is to examine available interventions in these areas. Hoge and Renzulli (1993) provide an initial list of

programs aimed to develop gifted students' self-concept and perceived competence but research on their effectiveness is limited.

Although a great deal of research exists on gifted students' self-concepts and perceived competencies, little research examines how gifted students' perceived abilities compare with their actual abilities. Gifted students rate their abilities higher than nongifted peers in academic, behavioral, global, and social domains, but are they actually more capable in these areas? Being academically gifted may skew the overall self-concepts of gifted students, positively influencing students' scores in the social, behavioral, and global domains. If true, a subsequent question is why does this trend towards higher perceived competencies not transfer to physical domains?

The reporting methods used in studies comparing gifted and nongifted students' self-concepts and perceived competencies are inconsistent and, often, incomplete. Many studies lacked detailed information regarding methods and participants. Most studies reported participants' grade levels but not their ages. Additionally, most researchers did not state the definition of giftedness used in the study. Of 106 included studies, 42 did not provide enough information to confidently code the method of gifted designation. Because the current meta-analysis shows that there are statistically significant differences between the self-concepts and perceptions of competence of those students identified as gifted and those students not identified as gifted, it is clear that gifted students do have common characteristics. However, because there are so many definitions of giftedness utilized in schools and studies, further exploration would be beneficial to examine differences between gifted students based on more specific information of designation.

Having established that gifted students have higher global self-concepts and higher perceived competence than nongifted students in three domains, a further step is to examine the influence of socio-economic status, race, or geographic location. The majority of included studies were from the United States, suggesting that generalizing these findings across nations may be inappropriate. The country in which participants are educated may influence results and further research comparing the self-concepts and perceived competencies of gifted and nongifted students in different nations would be beneficial. The possible influence of urban, suburban, and rural settings could provide additional insight, as well as the types of schools of participating students (private, public, charter, religious, etc.). Further, it would be beneficial to examine the attitudes towards education, achievement, and giftedness in participants' schools, homes, and communities. How others view giftedness may influence the self-perceptions of gifted and nongifted students. Different states, cities, schools, or families may lead to different perceptions for students similar in ability. Unfortunately, reporting of information necessary for this research is inconsistent.

Summary

The current meta-analysis provides additional insight on the global self-concepts and perceived competencies of gifted and nongifted students. Consistent with Hoge and Renzulli's (1993) findings, the current meta-analysis showed that gifted students have significantly higher perceived academic and behavioral competencies than their nongifted peers. Results also show that gifted students have significantly lower perceived athletic competence than their nongifted peers. Although statistically significant differences were found in all domains, the effect size values in the social, appearance, and global domains

were smaller than Cohen's (1992) .20 boundary for small effects, suggesting that, overall, gifted students do not have relevant deficits or advantages in these areas.

The current meta-analysis examined in detail the influence of moderator variables on the degree of difference between gifted and nongifted students' perceptions of themselves, building upon research by Hoge and Renzulli (1993). The study shows that differences between gifted and nongifted students' perceived academic competencies are moderated by student grade, gender, study publication status, study year, measure, and method of gifted designation. The current meta-analysis also shows that measure and grade are significant moderators of the differences between gifted and nongifted students' perceived behavioral competence. No significant moderators were identified for global self-concept, although significant heterogeneity of global self-concept effect sizes is evident. Differences in the perceived social, athletic, and appearance competencies of gifted and nongifted students were significantly homogeneous, suggesting that these differences are best accounted for by gifted status.

The current meta-analysis highlighted flaws in the reporting of gifted and self-concept research. Many studies were rejected because of the limited reporting of demographic and result information. Multiple studies did not report gifted and nongifted sample sizes, mean scores by group, or standard deviations by group. Procedural information such as how gifted students were identified was often omitted, as was demographic information such as geographic location, student enrollment in gifted programming, type of gifted programming, and even student age. Clear reporting standards should be established for studies on either self-concept or giftedness because

the omission of such basic information makes interpreting results inaccurate and, in some instances, inappropriate.

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Appendix A

Studies Considered for Meta-Analysis

Study	Journal Title	Year	Included?	If Not Included, Why Not?
1. Ablard	Roeper Review	1997	Yes	
2. Bain & Bell	Gifted Child Quarterly	2004	Yes	
3. Brady	Dissertation	1988	Yes	
4. Brody & Benbow	Journal of Youth & Adolescence	1986	Yes	
5. Brounstein, Holahan, & Dreyden	Journal of Applied Social Psychology	1991	Yes	
6. Chan	Gifted Child Quarterly	1988	Yes	
7. Chapman & Boersma	Perceptual and Motor Skills	1986	Yes	
8. Chapman & McAlpine	Gifted Child Quarterly	1988	Yes	
9. Chaudhari & Ray	Indian Journal of Behaviour	1992	Yes	
10. Colangelo, Kelly, & Schrepfer	Journal of Counseling and Development	1987	Yes	
11. Coleman & Fults	Gifted Child Quarterly	1982	Yes	
12. Cornell, Delcourt, Goldberg, & Bland	Journal for the Education of the Gifted	1992	Yes	
13. Davis & Connell	Gifted Child Quarterly	1985	Yes	
14. Feldhusen & Nimlos-Hippen	Gifted Educational International	1992	Yes	
15. Garzarelli & Everhart	Adolescence	1993	Yes	
16. Gilleland	Dissertation	1995	Yes	
17. Hotter	Dissertation	1986	Yes	
18. Jordan	Dissertation	1988	Yes	
19. Ke	Dissertation	1988	Yes	
20. Kelly & Colangelo	Exceptional Children	1984	Yes	
21. Kelly & Jordan	Journal of Counseling &	1990	Yes	

Study	Journal Title	Year	Included?	If Not Included, Why Not?
	Development			
22. Ketcham & Snyder	Psychological Reports	1977	Yes	
23. Klein & Zehms	Roeper Review	1996	Yes	
24. Lea-Woods & Clunies-Ross	Roeper Review	1995	Yes	
25. Li	Roeper Review	1988	Yes	
26. Loeb & Jay	Gifted Child Quarterly	1987	Yes	
27. McCoach & Siegle	Roeper Review	2002	Yes	
28. Montague & Van Garderen	Journal of Learning Disabilities	2003	Yes	
29. Pohlman	Dissertation	1986	Yes	
30. Pyryt & Mendaglio	Journal for the Education of the Gifted	1994	Yes	
31. Robinson-Awana, Kehle, & Jenson	Journal of Educational Psychology	1986	Yes	
32. Schneider, Clegg, Byrne, Ledingham, & Crombie	Journal of Educational Psychology	1989	Yes	
33. Stopper	Dissertation	1978	Yes	
34. Thatcher	Disseration	1987	Yes	
35. Tong & Yewchuk	Gifted Child Quarterly	1996	Yes	
36. Winne, Woodlands, & Wong	Journal of Learning Disabilities	1982	Yes	
37. Yong & McIntyre	Perceptual and Motor Skills	1991	Yes	
38. Lewis, Karnes, & Knight	Psychology in the Schools	1995	No	Inadequate self-concept reporting
39. Davis	Dissertation	1995	No	Not clear what was being compared
40. Crane	Dissertation	1987	No	Inadequate self-concept reporting
41. Lehman & Erdwins	Gifted Child Quarterly	1981	No	Inadequate self-concept reporting

Study	Journal Title	Year	Included?	If Not Included, Why Not?
42. Kelley	Dissertation	1989	No	Inadequate self-concept reporting
43. Mulcahy, Wilgosh, & Peat	Canadian Journal of Special Education	1990	No	Inadequate self-concept reporting
44. Callahan, Cornell, & Loyd	Journal for the Education of the Gifted	1990	No	Inadequate self-concept reporting
45. O'Such, Havertape, & Pierce	The Humanist Educator	1979	No	Inadequate self-concept reporting
46. Chovan & Morrison	Psychological Reports	1984	No	Inadequate self-concept reporting
47. Leroux	Journal for the Education of the Gifted	1988	No	No gifted/nongifted comparisons
48. LeRay	Dissertation	1983	No	No gifted/nongifted comparisons
49. Hawkins	Dissertation	1992	No	Inadequate self-concept reporting
50. Colangelo & Pfleger	Roeper Review	1978	No	No gifted/nongifted comparisons
51. Coleman & Fults	Roeper Review	1983	No	No gifted/nongifted comparisons
52. Ross & Parker	Exceptional Children	1980	No	No gifted/nongifted comparisons
53. Goldberg & Cornell	Journal for the Education of the Gifted	1998	No	Same data as prior publication already selected
54. Delcourt, Lyn, & Rejskind	Journal for the Education of the Gifted	1997	No	Not quantitative
55. Coleman & Fults	Remedial and Special Education	1985	No	No gifted/nongifted comparisons
56. Tidwell	Gifted Child Quarterly	1980	No	Inadequate self-concept reporting
57. Janos, Fung, & Robinson	Gifted Child Quarterly	1985	No	Inadequate self-concept reporting
58. Field, Harding, Yando,	Adolescence	1998	No	Comparisons do not match

Study	Journal Title	Year	Included?	If Not Included, Why Not?
Gonzalez, Lasko, Bendell, & Marks				domains of self-concept considered
59. Neufeld & Cozac	Alberta Journal of Educational Research	1980	No	No self-report measure
60. Mendaglio & Pyryt	Teaching Exceptional Children	1995	No	Inadequate self-concept reporting
61. Lewis & Knight	Gifted Child Quarterly	2000	No	No gifted/nongifted comparisons
62. Peters, Ma, Monks, & Ye	Nurturing Talent (book)	1995	No	Inadequate self-concept reporting
63. Colangelo & Assouline	Nurturing Talent (book)	1995	No	No gifted/nongifted comparisons
64. Freeman	Journal for the Education of the Gifted	1994	No	Inadequate self-concept reporting
65. Plucker	Journal for the Education of the Gifted	2003	No	No gifted/nongifted comparisons
66. Van Boxtel & Monks	Journal of Youth and Adolescence	1992	No	Inadequate self-concept reporting
67. Lu	Bulletin of Educational Psychology	1982	No	Not in English
68. Vaughn, Feldhusen & Asher	Gifted Child Quarterly	1991	No	Meta-analysis of pull-out programs
69. Karamessinis	Gifted Child Today	1980	No	Not located
70. Milgram & Milgram	Journal of Genetic Psychology	1976	No	Publication date outside of desired range
71. Swiatek	Journal of Youth and Adolescence	2001	No	Inadequate self-concept reporting
72. McCallister & Nash	Roeper Review	1996	No	Theoretical
73. Nail & Evans	Roeper Review	1997	No	No self-concept comparisons
74. Neihart	Roeper Review	1999	No	No self-concept comparisons

Study	Journal Title	Year	Included?	If Not Included, Why Not?
75. Moon & Chung	Talent for the Future (proceedings)	1992	No	Not quantitative
76. Sahin	Nurturing Talent (book)	1995	No	No gifted/nongifted comparisons
77. Vallerand, Gagne, Senecal, & Pelletier	Gifted Child Quarterly	1994	No	Inadequate self-concept reporting

Appendix B

Descriptive Information for Included Studies

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Ablard	5-8	p	OTR	ASC, SSC	NN	1997	c
Bain & Bell	5-8	p	OTR	GSC, SSC, ATC, PSC	--	2004	c
Bracken	5-8	p	OTR	GSC	GN	1980	c
Brady	5-8	u	OTR	GSC, ASC	GR	1988	m
Brady	5-8	u	OTR	GSC, ASC	GR	1988	f
Brody & Benbow	5-8	p	OTR	GSC	GR	1986	m
Brody & Benbow	5-8	p	OTR	GSC	GR	1986	f
Brounstein, Holahan, & Dreyden	5-8	p	OTR	GSC, ASC, ATC, PSC	GR	1991	c
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	m
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	m
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	m
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	f
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	f
Chan	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1988	f
Chapman & Boersma	5-8	p	OTR	ASC	GR	1986	c
Chapman & McAlpine	5-8	p	OTR	ASC	NR	1988	c

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Chaudhari and Ray	5-8	p	OTR	GSC	NR	1992	c
Colangelo, Kelly, & Schrepfer	5-8	p	OTR	SSC, BSC	GR	1987	m
Colangelo, Kelly, & Schrepfer	5-8	p	OTR	SSC, BSC	GR	1987	f
Coleman & Fults	1-4	p	PH	GSC	--	1982	c
Coleman & Fults	5-8	p	PH	GSC	--	1982	c
Coleman & Fults	5-8	p	PH	GSC	--	1982	c
Cornell, Delcourt, Goldberg, & Bland	1-4	p	Harter	ASC, SSC	GR	1992	c
Cornell, Delcourt, Goldberg, & Bland	1-4	p	Harter	GSC	GR	1992	c
Cornell, Delcourt, Goldberg, & Bland	1-4	p	Harter	ASC, SSC	GR	1992	c
Cornell, Delcourt, Goldberg, & Bland	1-4	p	Harter	GSC	GR	1992	c
Davis & Connell	5-8	p	Harter	GSC	NR	1985	c
Feldhusen & Nimlos-Hippen	5-8	p	PH	GSC	GR	1992	c
Feldhusen & Nimlos-Hippen	5-8	p	PH	GSC	GR	1992	c
Garzarelli & Everhart	5-8	p	OTR	GSC	--	1993	c
Gilleland	9-12	u	Harter	All	GR	1995	c
Hotter	5-8	u	PH	ASC, BSC, PSC	GR	1986	c
Jordan	5-8	u	Harter	All	GR	1988	c
Ke	1-4	u	PH	GSC, ASC, BSC, PSC	GR	1988	m
Ke	1-4	u	PH	GSC, ASC, BSC, PSC	GR	1988	f
Kelly & Colangelo	5-8	p	OTR	GSC, ASC, SSC, BSC	GR	1984	m
Kelly & Colangelo	5-8	p	OTR	GSC, ASC, SSC,	GR	1984	f

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Kelly & Jordan	5-8	p	Harter	ASC, SSC, ATC, BSC, PSC	GR	1990	m
Kelly & Jordan	5-8	p	Harter	ASC, SSC, ATC, BSC, PSC	GR	1990	f
Ketcham & Snyder	1-4	p	PH	GSC	--	1977	c
Klein & Zehms	1-4	p	PH	GSC	GR	1996	f
Klein & Zehms	5-8	p	PH	GSC	GR	1996	f
Klein & Zehms	5-8	p	PH	GSC	GR	1996	f
Lea-Woods & Clunies-Ross	5-8	p	OTR	GSC	GR	1995	f
Li	1-4	p	Harter	All	GR	1988	m
Li	1-4	p	Harter	All	GR	1988	f
Li	5-8	p	Harter	All	GR	1988	m
Li	5-8	p	Harter	All	GR	1988	f
Loeb & Jay	5-8	p	PH	GSC	GR	1987	m
Loeb & Jay	5-8	p	PH	GSC	GR	1987	f
McCoach & Siegle	9-12	p	OTR	ASC	GR	2002	c
Montague & Van Garderen	5-8	p	OTR	ASC	GR	2003	c
Pohlman	1-4	u	Harter	All	GR	1986	m
Pohlman	1-4	u	Harter	All	GR	1986	f
Pohlman	5-8	u	Harter	All	GR	1986	m
Pohlman	5-8	u	Harter	All	GR	1986	m
Pohlman	5-8	u	Harter	All	GR	1986	m
Pohlman	5-8	u	Harter	All	GR	1986	m
Pohlman	5-8	u	Harter	All	GR	1986	f
Pohlman	5-8	u	Harter	All	GR	1986	f
Pyryt & Mendaglio	9-12	p	OTR	ASC, SSC, ATC	GR	1994	c
Robinson-Awana, Kehle, &	5-8	p	OTR	GSC	GR	1986	m

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Jenson							
Robinson-Awana, Kehle, & Jenson	5-8	p	OTR	GSC	GR	1986	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	5-8	p	Harter	GSC, ASC, SSC, ATC	GR	1989	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	9-12	p	OTR	GSC, ASC, ATC, PSC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	9-12	p	OTR	GSC, ASC, ATC, PSC	GR	1989	m
Schneider, Clegg, Byrne, Ledingham, & Crombie	9-12	p	OTR	GSC, ASC, ATC, PSC	GR	1989	f
Schneider, Clegg, Byrne, Ledingham, & Crombie	9-12	p	OTR	GSC, ASC, ATC, PSC	GR	1989	f
Stopper	1-4	u	PH	GSC, ASC	GR	1978	m

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Stopper	1-4	u	PH	GSC, ASC	GR	1978	f
Stopper	5-8	u	PH	GSC, ASC	GR	1978	m
Stopper	5-8	u	PH	GSC, ASC	GR	1978	f
Stopper	1-4	u	PH	GSC, ASC	GR	1978	m
Stopper	1-4	u	PH	GSC, ASC	GR	1978	f
Stopper	5-8	u	PH	GSC, ASC	GR	1978	m
Stopper	5-8	u	PH	GSC, ASC	GR	1978	f
Stopper	1-4	u	OTR	GSC, ASC	GR	1978	m
Stopper	1-4	u	OTR	GSC, ASC	GR	1978	f
Stopper	1-4	u	OTR	GSC, ASC	GR	1978	m
Stopper	1-4	u	OTR	GSC, ASC	GR	1978	f
Thatcher	1-4	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	5-8	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	5-8	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	5-8	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	5-8	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	9-12	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	9-12	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	9-12	u	PH	GSC, ASC, BSC, PSC	GR	1987	c
Thatcher	9-12	u	PH	GSC, ASC, BSC,	GR	1987	c

Study	Grade	Publication Status	Measure	Domains	Comparison	Year	Gender
Tong & Yewchuk	9-12	p	PH	GSC, ASC, BSC, PSC	GR	1996	c
Winne, Woodlands, & Wong	5-8	u	OTR	GSC, ASC, SSC, ATC, PSC	NR	1982	c
Yong & McIntyre	5-8	p	PH	GSC, ASC, BSC, PSC	GR	1991	c

Note: GSC = global self-concept, ASC = perceived academic competence, SSC = perceived social competence, BSC = perceived behavioral competence ATC = perceived athletic competence, PSC = perceived appearance competence, ES = effect size, -- = no results reported, m = male sample, f = female sample, c = combined male and female sample, GR = comparison of gifted and regular classroom students, NR = comparison of nonlabeled gifted and regular students, GN = comparison of gifted and normative data, NN = comparison of nonlabeled gifted and normative data, PH = Piers-Harris Measure, Harter = one of three Harter perceived competence measures, u = unpublished study, p = published study.

Appendix C

Unweighted Effect Sizes for All Cases

Study	Year	Sample Size	Gender	Grade	GSC ES	ASC ES	SSC ES	ATC ES	BSC ES	PSC ES
Ablard	1997	174	c	5-8	--	.67	.04	--	--	--
Bain & Bell	2004	93	c	5-8	.73	--	.70	.91	--	.81
Brady	1988	43	m	5-8	.32	.47	--	--	--	--
Brady	1988	55	f	5-8	-.09	.03	--	--	--	--
Brody & Benbow	1986	304	m	5-8	.02	--	--	--	--	--
Brody & Benbow	1986	201	f	5-8	.08	--	--	--	--	--
Brounstein, Holahan, & Dreyden	1991	434	c	5-8	-.26	.93	--	-.61	--	-.59
Chan	1988	58	m	5-8	-.11	.38	.06	-.36	--	--
Chan	1988	50	m	5-8	.38	1.30	.29	.08	--	--
Chan	1988	49	m	5-8	.61	1.00	.05	-.15	--	--
Chan	1988	55	f	5-8	.27	.43	.13	-.34	--	--
Chan	1988	50	f	5-8	.85	1.59	.38	.68	--	--
Chan	1988	63	f	5-8	.80	1.28	.50	.01	--	--
Chapman & Boersma	1986	109	c	5-8	--	.75	--	--	--	--
Chapman & McAlpine	1988	100	c	5-8	--	.98	--	--	--	--
Chaudhari & Ray	1992	105	c	5-8	.66	--	--	--	--	--
Colangelo, Kelly, & Schrepfer	1987	113	m	5-8	--	--	.17	--	.29	--
Colangelo, Kelly, & Schrepfer	1987	110	f	5-8	--	--	.20	--	.11	--
Coleman and Fults	1982	48	c	1-4	-.31	--	--	--	--	--
Coleman and Fults	1982	44	c	5-8	-.94	--	--	--	--	--
Coleman and Fults	1982	42	c	5-8	-.68	--	--	--	--	--
Cornell, Delcourt, Goldberg, & Bland	1992	708	c	1-4	--	.16	.16	--	--	--

Study	Year	Sample Size	Gender	Grade	GSC ES	ASC ES	SSC ES	ATC ES	BSC ES	PSC ES
Cornell, Delcourt, Goldberg, & Bland	1992	652	c	1-4	.15	--	--	--	--	--
Cornell, Delcourt, Goldberg, & Bland	1992	305	c	1-4	--	.00	-.13	--	--	--
Cornell, Delcourt, Goldberg, & Bland	1992	154	c	1-4	.00	--	--	--	--	--
Davis & Connell	1985	125	c	5-8	.30	--	--	--	--	--
Feldhusen & Nimlos-Hippen	1992	29	c	5-8	.24	--	--	--	--	--
Feldhusen & Nimlos-Hippen	1992	37	c	5-8	.80	---	--	--	--	--
Garzarelli & Everhart	1993	66	c	5-8	.46	--	--	--	--	--
Gilleland	1995	71	c	9-12	-.21	.85	-.76	-.66	.22	.18
Hotter	1986	86	c	5-8	--	.62	--	--	.28	.19
Jordan	1988	60	c	5-8	.26	2.38	-.45	-.66	1.17	-.18
Ke	1988	60	m	1-4	-.09	.06	--	--	-.22	-.10
Ke	1988	60	f	1-4	.63	.91	--	--	.24	.72
Kelly & Colangelo	1984	124	m	5-8	.60	-.74	.36	--	.31	--
Kelly & Colangelo	1984	117	f	5-8	.22	-.49	.18	--	.07	--
Kelly & Jordan	1990	30	m	5-8	--	1.39	.09	-.02	.54	-.07
Kelly & Jordan	1990	30	f	5-8	--	2.07	.52	.34	.76	-.07
Ketcham & Snyder	1977	72	c	1-4	.12	--	--	--	--	--
Klein & Zehms	1996	29	f	1-4	.30	--	--	--	--	--
Klein & Zehms	1996	61	f	5-8	-.01	--	--	--	--	--
Klein & Zehms	1996	44	f	5-8	-.67	--	--	--	--	--
Lea-Woods	1995	158	f	5-8	.55	--	--	--	--	--
Li	1988	25	m	1-4	.13	.65	.02	-.64	.36	-.22
Li	1988	26	f	1-4	.22	.94	-.40	-.99	.55	-.92
Li	1988	25	m	5-8	.09	.17	-.07	.05	.32	.38
Li	1988	22	f	5-8	.38	1.34	.33	-.25	.91	-.21

Study	Year	Sample Size	Gender	Grade	GSC ES	ASC ES	SSC ES	ATC ES	BSC ES	PSC ES
Loeb & Jay	1987	106	m	5-8	.01	--	--	--	--	--
Loeb & Jay	1987	121	f	5-8	.31	--	--	--	--	--
McCoach & Siegle	2002	352	c	9-12	--	1.04	--	--	--	--
Montague & Van Garderen	2003	90	c	5-8	--	.27	--	--	--	--
Pohlman	1986	16	m	1-4	1.13	1.15	.17	.02	-.57	-.02
Pohlman	1986	10	f	1-4	-.51	1.00	.36	-.64	.45	-.10
Pohlman	1986	24	m	5-8	.43	1.37	.36	.31	1.11	-.18
Pohlman	1986	24	m	5-8	.33	2.02	-.07	-.18	1.02	-.06
Pohlman	1986	18	m	5-8	.00	1.48	-.77	-1.49	.55	.10
Pohlman	1986	8	m	5-8	.26	3.12	.43	-.74	1.72	-.04
Pohlman	1986	8	f	5-8	.59	1.02	.21	-.11	.52	.11
Pohlman	1986	8	f	5-8	.78	.93	.60	.00	.94	-.71
Pyryt & Mendaglio	1994	88	c	9-12	--	1.15	.55	.28	--	--
Robinson-Awana, Kehle, & Jenson	1986	50	m	5-8	.04	--	--	--	--	--
Robinson-Awana, Kehle, & Jenson	1986	50	f	5-8	.49	--	--	--	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	71	m	5-8	-.18	.66	-.11	-.40	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	68	m	5-8	.57	.16	.79	.00	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	48	m	5-8	-.27	1.11	-.46	.09	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	55	m	5-8	.02	.11	-.16	-.20	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	73	f	5-8	.15	.98	-.30	-.24	--	--
Schneider, Clegg, Byrne,	1989	74	f	5-8	-.30	-.12	-.02	-.63	--	--

Study	Year	Sample Size	Gender	Grade	GSC ES	ASC ES	SSC ES	ATC ES	BSC ES	PSC ES
Ledingham, & Crombie										
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	70	f	5-8	-.04	1.26	-.14	-.45	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	61	f	5-8	.07	.34	-.26	-.11	--	--
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	59	m	9-12	-.23	.33	--	.04	--	-.32
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	43	m	9-12	-.15	.01	--	.10	--	.18
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	80	f	9-12	.52	.61	--	.06	--	.09
Schneider, Clegg, Byrne, Ledingham, & Crombie	1989	41	f	9-12	.61	.52	--	-.21	--	.12
Stopper	1978	35	m	1-4	.54	.45	--	--	--	--
Stopper	1978	57	f	1-4	.05	.32	--	--	--	--
Stopper	1978	55	m	5-8	-.20	-.48	--	--	--	--
Stopper	1978	49	f	5-8	-.20	-.89	--	--	--	--
Stopper	1978	47	m	1-4	-.12	.39	--	--	--	--
Stopper	1978	54	f	1-4	-.35	.08	--	--	--	--
Stopper	1978	44	m	5-8	.53	.47	--	--	--	--
Stopper	1978	45	f	5-8	-.04	.31	--	--	--	--
Stopper	1978	44	m	1-4	-.61	-.30	--	--	--	--
Stopper	1978	56	f	1-4	.35	.08	--	--	--	--
Stopper	1978	43	m	1-4	-.17	-.53	--	--	--	--
Stopper	1978	41	f	1-4	-.52	.30	--	--	--	--
Thatcher	1987	20	c	1-4	-.54	-.72	--	--	-.06	-.32
Thatcher	1987	24	c	5-8	.27	.74	--	--	.00	-.17
Thatcher	1987	19	c	5-8	1.15	.60	--	--	.95	.19

Study	Year	Sample Size	Gender	Grade	GSC ES	ASC ES	SSC ES	ATC ES	BSC ES	PSC ES
Thatcher	1987	19	c	5-8	.49	.64	--	--	1.42	.06
Thatcher	1987	20	c	5-8	.41	.42	--	--	.20	.51
Thatcher	1987	20	c	9-12	-.08	.36	--	--	-.30	-.29
Thatcher	1987	21	c	9-12	-.72	-.68	--	--	-.69	-.59
Thatcher	1987	19	c	9-12	.12	.28	--	--	-.53	.12
Thatcher	1987	18	c	9-12	-.21	.20	--	--	-.47	.06
Tong & Yewchuk	1996	78	c	9-12	-.16	.36	--	--	-.06	-.05
Winne, Woodlands, & Wong	1982	118	c	5-8	-.03	.31	-.12	-.27	--	-.21
Yong & McIntyre	1991	80	c	5-8	.26	.31	--	--	.56	-.15

Note: GSC = global self-concept, ASC = perceived academic competence, SSC = perceived social competence, BSC = perceived behavioral competence, ATC= perceived athletic competence, PSC = perceived appearance competence, ES = effect size, -- = no results reported, m = male sample, f = female sample, c = combined male and female sample.

Appendix D

Output from Lipsey and Wilson's (2001) MeanES Macro.

Table D1

Global Self-Concept MeanES Output

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*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      85.000       -.922       1.097        .334

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed      .1171     .0625     .1717     .0279    4.2023     .0000
Random     .1246     .0466     .2026     .0398    3.1306     .0017

------- Random Effects Variance Component ------------------------
v    =    .047798

------- Homogeneity Analysis -------------------------------------
           Q          df           p
    143.8504     84.0000       .0001

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Table D2

Perceived Academic Competence MeanES Output

```
*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      72.000       -.871       2.016        .498

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed      .4716     .4147     .5285     .0290   16.2534     .0000
Random     .4817     .3546     .6089     .0649    7.4250     .0000

------- Random Effects Variance Component ------------------------
v    =    .196964

------- Homogeneity Analysis -------------------------------------
           Q          df           p
    295.1345     71.0000       .0000

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Table D3

Perceived Social Competence MeanES Output

```
*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      40.000       -.753        .783        .282

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed      .0711     .0003     .1419     .0361    1.9678     .0491
Random     .0656    -.0356     .1668     .0516    1.2700     .2041

------- Random Effects Variance Component ------------------------
v    =    .031065

------- Homogeneity Analysis -------------------------------------
           Q          df           p
     60.9348     39.0000       .0139

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Table D4

Perceived Athletic Competence MeanES Output

```
*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      36.000       -.959        .667        .327

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed     -.2437    -.3344    -.1531     .0463   -5.2699     .0000
Random    -.2013    -.3171    -.0856     .0590   -3.4100     .0006

------- Random Effects Variance Component ------------------------
v    =    .033721

------- Homogeneity Analysis -------------------------------------
           Q          df           p
     49.9127     35.0000       .0489

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Table D5

Perceived Behavioral Competence MeanES Output

```
*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      34.000       -.666       1.493        .415

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed      .2829     .1710     .3948     .0571    4.9541     .0000
Random     .3045     .1533     .4557     .0771    3.9474     .0001

------- Random Effects Variance Component ------------------------
v    =    .067795

------- Homogeneity Analysis -------------------------------------
           Q          df           p
     52.8235     33.0000       .0157

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Table D6

Perceived Appearance Competence MeanES Output

```
*****  Meta-Analytic Results  *****

------- Distribution Description ---------------------------------
           N      Min ES      Max ES    Wghtd SD
      33.000       -.589        .491        .282

------- Fixed & Random Effects Model -----------------------------
         Mean ES    -95%CI    +95%CI        SE         Z         P
Fixed     -.1591    -.2617    -.0565     .0523   -3.0399     .0024
Random    -.1591    -.2617    -.0565     .0523   -3.0399     .0024

------- Random Effects Variance Component ------------------------
v    =    .000000

------- Homogeneity Analysis -------------------------------------
           Q          df           p
     28.9233     32.0000       .6231

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Appendix E

Sample Output from Lipsey and Wilson's (2001) MetaF Macro.

Global Self-Concept and Gender

```
 *****  Inverse Variance Weighted Oneway ANOVA  *****

 *****  Fixed Effects Model via OLS  *****

------- Analog ANOVA table (Homogeneity Q)  -------
                  Q           df            p
Between       4.0441       2.0000        .1324
Within      139.8063      82.0000        .0001
Total       143.8504      84.0000        .0001

------- Q by Group -------
    Group        Q       df        p
   1.0000  31.7676  27.0000    .2408
   2.0000  43.2782  29.0000    .0429
   3.0000  64.7605  26.0000    .0000

------- Effect Size Results Total    -------
      Mean ES       SE   -95%CI   +95%CI        Z        P        N
Total    .1171    .0279    .0625    .1717   4.2023    .0000  85.0000

------- Effect Size Results by Group -------
Group  Mean ES       SE   -95%CI   +95%CI        Z        P        N
1.0000    .0785    .0535   -.0263    .1833   1.4680    .1421  28.0000
2.0000    .1994    .0495    .1023    .2965   4.0263    .0001  30.0000
3.0000    .0793    .0434   -.0058    .1643   1.8268    .0677  27.0000

------ END MATRIX -----
```