Parent-rated strengths of children and adolescents with down syndrome

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Parent-Rated Strengths of Children and Adolescents with Down Syndrome

by

Nicole Keenan

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Abstract

Down syndrome (DS), one of the most common congenital disorders, influences physical appearance and is generally associated with pervasive delays (Unruh, 1994). Individuals with DS may experience some degree of social incompetency, emotional difficulty, and behavioral problems, and research suggests that these tend to follow age-related trends (Feeley & Jones, 2006; Williams, Wishart, Pitcairn, & Willis, 2005). Such behaviors influence family functioning, educational placements, mental health, and opportunities for social growth (Buckley, Bird, Sacks, & Archer, 2006; Hodapp, Ricci, Ly, & Fidler, 2003).

Currently, there are no known studies that examine social, emotional, and behavioral (SEB) functioning in the DS population from a strength-based perspective or as a function of age. Not only is strength based assessment (SBA) in line with the recent shift toward positive psychology (Dykens, 2006), but it is also mandated by the Individual with Disabilities Education Act (IDEA) of 2004.

This study examined and compared the parent-rated strengths of 83 children and adolescents with DS using the Behavioral and Emotional Rating Scale-2 (BERS-2), Parent Rating Scale. Findings indicated that the overall strength level of each age group was average in comparison to the normative sample. School Functioning was the only subscale for which individuals with DS were found to be below average in comparison to the normative sample. Additionally, there were no significant mean differences between the strength levels (overall and subscale) of each age group, nor was there any significant difference in strengths between males and females. Results, however, indicated that
students with DS in inclusive educational placements have significantly higher overall strength scores than those in self-contained placements.

Based upon the results of this study, it is suggested that increasing a student with DS’ SEB strengths in a variety of areas may increase his or her chances of being placed in a more advantageous academic setting. Additionally, it is recommended that future research investigate the below average School Functioning subscale finding by examining the effects of comorbid conditions such as Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorders (ASD) on strength levels.
ACKNOWLEDGEMENTS

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CHAPTER 1

Introduction

Down syndrome (DS) is one of the most common congenital disorders in existence (Nadel, 2003). It is a condition that influences the outward, physical appearance of individuals as well as their abilities and functioning in a variety of areas. Almost all individuals born with DS experience some degree of intellectual disability and learning difficulty, as well as deficits in language and communication (Unruh, 1994).

Years ago, individuals with DS were seen as “defectives” that were trainable rather than educable, and were most often excluded from schools or automatically placed in self-contained educational settings (Blacketer-Simmonds, 1953). Within the past few decades, the rights and value of these individuals have improved with changes in social attitudes and legislation (Carr, 2008). Today, students with DS are often included in mainstream educational settings and have become meaningful contributors to society (Hodapp, 1996).

DS is almost always diagnosed at birth, or shortly thereafter, and is generally associated with global and pervasive delays. As such, psychoeducational evaluations primarily serve to identify levels of functioning, as well as areas of strength and need, in order to create the most beneficial educational programming and supports (Davis, 2008).

Over the years, a growing body of research has illuminated patterns of strengths and weaknesses that are likely to emerge within these individuals as a result of their common disorder, and have collectively been referred to as the DS phenotype. The DS phenotypes for language/communication and cognition have been consistently identified. Strengths within these areas have been identified and utilized to inform interventions.
The research regarding the social, emotional, and behavioral (SEB) phenotypes of these individuals is more variable, discrepant, and the characteristics seem to change significantly with age (Fidler, Hepburn, & Rogers, 2006; Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004). Accordingly, strengths and weaknesses in these areas are not as well established, and related interventions are not as well developed as compared to those of language and communication.

Traditionally, people with DS have been viewed as highly sociable and friendly individuals (Blacketer-Simmmonds, 1953) with very few, if any, emotional and behavioral difficulties (Schlottmann & Anderson, 1975). More recent research, however suggests that this traditional view is stereotypical and that individuals with DS do indeed experience some degree of social incompetency, emotional difficulty, and behavioral problems, and that these tend to follow age-related trends (Feeley & Jones, 2006; Williams, Wishart, Pitcairn, & Willis, 2005). Such behaviors influence family functioning, educational placements, mental health, and opportunities for social growth (Buckley, Bird, Sacks, & Archer, 2006; Hodapp, Ricci, Ly, & Fidler, 2003).

Currently, there are no known studies that examine SEB functioning in the DS population from a strength-based perspective or that evaluate level of strengths by age. Strength-based assessment (SBA) involves the measurement of positive emotions, behaviors, and aspects of an individual’s life (Epstein, 2004). Investigating strengths enables parents and professionals to view assessments and interventions in a more positive way (Epstein, 2004). Not only is SBA in line with the recent shift toward positive psychology (Dykens, 2006), but it is also mandated by the Individual with Disabilities Education Act of 2004. This Act states that individual strengths must be
considered in the development of each student’s Individualized Education Plan (IEP) and encourages the creation of supports and services that build upon already existing strengths (Epstein, Rudolph, & Epstein, 2000).

Although the majority of research involving the DS population has grouped males and females together, emerging evidence suggests that strengths and weaknesses in the SEB phenotype may vary by gender. For example, Begley (1999) found females with DS to have more positive perceptions of themselves overall than males. Additionally, Leonard, Msall, Bower, Tremont, and Leonard (2002) found females with DS to score higher than males on a measure of functional independence including communication and social skills.

It is widely believed that opportunities for appropriate social and behavioral growth of students with DS are increased when they are placed in mainstream educational settings (Buckley et al., 2006; Feeley & Jones, 2006). Years ago, most individuals with DS and other disabilities were segregated educationally (Margulies, 2007). For students with emotional and behavioral disorders (EBD), it has been found that SEB strengths play a role in educational placements (Oswald, Cohen, Best, Jenson, & Lyons, 2001). Whether or not SEB strengths play a role in educational placements for children and adolescents with DS has not yet been studied.

**Purpose of the Study**

The purpose of this study was to investigate SEB strengths in children and adolescent students with DS. Additionally, the purpose was to investigate differences in levels of strengths by gender, and to determine whether or not SEB strengths were related to educational placements for children and adolescents with DS. Parents rated their sons’
or daughters’ strengths using a rating scale. Based on a review of the literature, parents were used as reporters rather than teachers or other individuals, given that they know the children best, interact with them across a multitude of settings over the course of the children’s life span, and are able to make global judgments about behavioral characteristics (Hodapp & Dykens, 2005; Mooney, Epstein, Ryser, & Pierce, 2005).

Parents provided additional information about themselves and their children by completing the Parent Questionnaire, which was created by the primary researcher of this study. The information gathered by these measures was used to compare the levels of strengths of children and adolescents with Down syndrome, as well as compare levels of strengths by gender and level of restrictiveness of educational placement.

**Significance of the Study**

Broadly, this study answered a call to explore and expand the widely growing field of positive psychology to individuals with intellectual disabilities and learning disabilities (Dykens, 2006). More specifically, it adds to the research on DS behavioral phenotypes. While acknowledging and respecting individual variation, this study highlighted differences in SEB functioning in students with DS at various ages. This information may be utilized by school staff to determine what types of interventions might be implemented, and at what age such interventions are most likely to benefit these students. This is important because interventions informed by behavioral and learning profiles help educators and practitioners focus on strengths in order to counter weaknesses (Tsao & Kindelberger, 2009).

Results of this study highlighted how students with DS compare to their typically developing classmates/peers in a qualitative (i.e., above average, average, below average)
manner based upon normative scores. Although students with DS have traditionally been stereotyped as friendly, affectionate, sociable individuals with very few behavioral difficulties, little research has compared them qualitatively to typically developing peers. Results of this study provided such information and may help dispel stereotypes or support educators in developing realistic goals and expectations for these students.

In a narrower vein, the results compared strength levels of children and adolescents with DS in order to gain information to inform specific goals and identify any windows of opportunity for interventions. Research has already found shifts during this time period in specific areas of internalizing and social behaviors suggesting developmental influences on behavioral phenotypes (Fidler, Barrett, & Most, 2005).

Furthermore, as already discussed, this study investigated strengths in relation to gender and school placement for students with DS. This is important because the results shed light on strength levels that are associated with more or less restrictive educational placements. Although some factors, such as gender, cannot be changed, interventions may be appropriately targeted at one or the other.

Overall, this study provided information about the strengths of children and adolescents with DS. It gives parents greater knowledge of their children, their behavioral phenotypes, and what trends may emerge during development. Since the field of positive psychology has recently merged with school psychology, there are implications for schools and educators. Given that strength-based assessment has been incorporated into current educational law and Response to Intervention (RtI) procedures, it has the potential to impact educational placements. Finally, results have implications for persons with DS. Although these individuals have been segregated and devalued in
society, this has changed in the past few decades. This study recognizes the value of assessing strengths in students with DS and the application of positive psychology to students with intellectual disabilities.
CHAPTER 2

Review of the Literature

Overview

Down syndrome is a congenital condition that affects approximately 1 in 700-800 individuals (Kozma, 2008). It is associated with specific physical features (Bowman-Kruhm, 2000), medical health problems (Pueschel, 2006), and developmental patterns (Mijovic & Turk, 2008). People with DS generally experience deficits or delays in a wide range of areas including academic achievement, language, and cognition (Roizen & Patterson, 2003).

Extensive research in the areas of language and cognition, specifically, has led to the creation of a profile of likely functioning (i.e., phenotype). The profile includes strengths, which can be utilized to inform interventions and increase the likelihood of success (Hodapp & Dykens, 2005). Less research has been done investigating the SEB functioning of individuals with DS, and the results are varied.

The SEB functioning of individuals with DS has traditionally been highlighted as an area of strength. Recently, this has been questioned (Sigman & Ruskin, 1999). Age-related changes in problematic areas have been highlighted, specifically with reference to shifts between childhood and adolescence, and their possible relation to even greater difficulties in adulthood (Fidler et al., 2005).

The following chapter is organized into four major sections. The first section is an introduction to DS. It provides a definition of the condition, as well as commonly associated physical characteristics and medical concerns. It includes information about the impact of a child with DS on family functioning, as well as other family-related
issues. It concludes with a review of school-related DS topics including benefits of, and beliefs regarding, inclusion versus self-contained education.

The second section includes information on behavioral phenotypes and describes their value and function. It proceeds to describe the specific behavioral phenotype for DS in the areas of language/communication, and cognition. In addition to discussing the weaknesses, the second section includes a discussion of the likely strengths in both of these areas and how they are specifically utilized to build upon areas of need. Next, the section describes the DS behavioral phenotype as related to SEB functioning. It explains how the traditional view of global strengths has recently been questioned and includes evidence supporting both views.

The third major section in this chapter begins with a broad discussion of the recent positive psychology movement, and then specifically how it relates to the field of school psychology. This leads to a discussion of strength-based assessment of SEB functioning, and how it relates to the current trend toward RtI and utilizing students’ strengths to inform interventions. Finally, it discusses SBA with specific regard to DS, noting that there is discrepant information regarding the SEB functioning of individuals with DS, and there is no research using a standardized, strength-based measure with this population. The final section is a summary of this review. Additionally, specific research questions are outlined.

**Down Syndrome**

Over 6,000 babies are born with DS in the United States every year. This means that 1 in every 700-800 babies born in the United States have DS (Kozma, 2008). This condition, which is one of the most common congenital disorders found across the world
in every race, nationality, socioeconomic class, and ethnic group, was named after the first physician to identify it in the 19th century, John Langdon Down (Kozma, 2008). DS is not caused by any behavior or act on the part of either parent, although the older a woman becomes, the greater the chance of her having a baby with DS (Bowman-Kruhm, 2000).

DS refers to a genetic condition in which there is a third copy of the 21st chromosome, and is often referred to as trisomy 21. The individual resultanty has 47 chromosomes in his or her cells rather than the usual 46. Accordingly, a diagnosis is made through chromosome analysis either prenatally or shortly after birth following the observation of the infant’s characteristic physical appearance (Roizen & Patterson, 2003).

Although trisomy 21 is the most common cause of DS, it can also occur by translocation, which is when part of chromosome 21 attaches to another chromosome. The third and least common cause of DS is called mosaicism, which occurs when the nondisjunction of chromosome 21 places an extra copy in some cells (Roberts, Price, & Malkin, 2007). Chromosomes and the genetic material they carry play a major part in determining an individual’s characteristics. It affects an individual’s bodily characteristics, physical and mental health, intellectual development, personality, and temperament (Kozma, 2008).

**Physical characteristics and medical issues.** Individuals with DS often have distinguishing physical features. Their noses may be broad and their nasal bridges flatter than is usual. The nasal passages also may be smaller and consequently can become easily congested. Their eyes often appear to slant upward. Their mouths may be small, and the roofs of their mouths may be shallow. When accompanied by low muscle tone,
or hypotonia, which is yet another common physical characteristic, babies with DS often appear to have a protruding tongue (Bowman-Kruhm, 2000). Babies with DS are generally of average weight and length, although they do not grow as fast as other children. Individuals with DS typically do not reach average adult height (Kozma, 2008), and they are known to experience complex medical problems (Kusters, Verstegen, Gemen, & de Vries, 2009).

Although many individuals with DS are in good health, they tend to experience a variety of medical concerns at a higher frequency than those without DS (Pueschel, 2006). A study by Thompson, McGinn, and Hill (1999), examining the physical health conditions of children with DS aged 4-19 found hearing problems (74%), ocular/visual problems (74%), behavior problems (44%), obesity (28%), congenital heart disease (26%), elevated thyroid-stimulating hormone (12%), and hypothyroidism (7%). As a result of being vulnerable to many health conditions during school-age, Thompson, McGinn, and Hill (1999) suggest the need for a focused medical service during this time period. The service would involve community and school health care workers collaborating to deliver more specialized and focused medical screenings guided by the physical vulnerabilities known to exist in individuals with DS (Thompson, McGinn, & Hill, 1999).

As compared to individuals in the general population, those with DS also have been shown to experience increased frequencies of celiac disease, diabetes mellitus, leukemia, and other diseases of the autoimmune system (Kusters et al., 2009). Earlier historical theories suggested that the immune system of individuals with DS experienced precocious aging, whereas more recent evidence indicates an intrinsically deficient
immune system (Kusters et al., 2009). The physical health problems of children with DS are important because they have been found to be associated with higher levels of behavior problems as well as increasing maternal stress over time (Turner, Sloper, Cunningham, & Knussen, 1990)

**Family issues.** Ecological contexts include all of the environments in which an individual lives and interacts. It can be argued that the family context has the strongest influence on a child’s psychological growth, development, and well-being (Crnic, 1990). In turn, children have unique influences on family relationships and functioning. The behavior patterns and developmental trends of children with varying disorders can have bidirectional effects on family functioning. Specifically, this means that the predisposition of a child to behave in a specific manner as a result of a genetic condition creates likely behavioral and emotional reactions from parents, caregivers, and other adults (Hodapp, Ly, Fidler, & Ricci, 2001).

Caring for a child with a disability can be a stressor to a family unit (Hastings, Thomas, & Delwiche, 2002), and the early prevailing view was that families with offspring with disabilities were negatively affected. In the 1980s, this view began to change. Research suggested that a child with a disability did indeed present a stressor to families, but that many coped well (Hodapp, 2007). Furthermore, families who have a child with DS tend to cope better than families who have a child with other types of disabilities, thus experiencing what is known as the DS advantage (Hodapp, 2007).

This advantage was examined by Stoneman (2007), who indeed found that families of children with DS, in comparison to families with children with mixed/unknown etiologies, had lower levels of maternal and paternal depression, higher
levels of maternal and paternal self-reported warm parenting, and higher levels of observed maternal warmth. The author cautioned that the results may have been confounded by family income, which was higher for families with children with DS. This is often the case because families of children with DS are more likely to be in later stages of the life cycle and to have had more opportunity to acquire financial resources. Similar findings, however, have been found by other researchers (Hodapp, Ly, Fidler, & Ricci, 2001).

A study by Hodapp et al. (2003) found that mothers of children with DS, compared to mothers of children with other types of learning difficulties, experienced lower levels of child-related stress. This was due to the mother’s acceptance of her child and the degree to which she found her child to be reinforcing. The level of child maladaptive behavior, however, was a significant predictor of maternal stress for children with DS. As the level of child maladaptive behavior increased, so did the level of the mother’s stress. Interestingly, the child’s age was also a factor. Namely, mothers’ levels of child-related stress increased as their children with DS aged, specifically into the adolescent years. This finding was also found for a younger time period; ages 15-45 months, where mothers’ level of stress increased with the increasing age of the child, as well as with increased levels of child maladaptive behaviors (Most, Fidler, Laforce-Booth, & Kelly, 2006).

Mothers’ levels of stress can also be related to resources such as support systems. For example, it has been found that grandparents’ levels of support and conflict have significant effects on the levels of stress of mothers with children with DS (Hastings et al., 2002). Specifically, as levels of perceived grandparent support increases, levels of
mothers’ stress decreases (Hastings et al., 2002). As levels of perceived conflict with grandparents increases, levels of mothers’ stress increases as well (Hastings et al., 2002). This finding did not hold true for fathers, suggesting that the stress levels of mothers and fathers of children with DS should be considered separately (Hastings et al., 2002).

**Down syndrome in the schools.** The DS advantage appears to spill over into the educational setting in terms of parent knowledge. Specifically, parents of children with DS tend to have more knowledge of their children’s etiology-related educational strengths and weaknesses than parents of children with either Prader-Willi syndrome or Williams syndrome (Fidler, Hodapp, & Dykens, 2002). The authors also indicated that etiology-related information was brought more often into the school setting by teachers, school psychologists, and therapists. They suggested that this may partly be a result of the popularity of the syndrome in the media (e.g., television shows such as *Life Goes On*) and the historical and current presence of several large and active parent organizations.

Many years ago, children with disabilities were excluded from public schools. Their families were encouraged by physicians and other professionals to send them away to receive training at state-run facilities (Margulies, 2007). Children with DS who were sent away to such facilities generally received little to no education and some even lived in extremely poor conditions (Margulies, 2007). In the 1950s, families of children with DS began to advocate for their youngsters. Accordingly, some schools began to voluntarily create classes for these children. Children with DS were almost always placed in trainable classrooms which did not always support reading and other academic skills (Simons, 2008). In the 1970s, great change was seen as a result of educational law (Bowman-Kruhm, 2000).
Public Law 94-142, originally passed in 1975, was designed to help citizens with disabilities such as DS. This law has been amended several times and has been known since 2004 as the Individuals with Disabilities Education Improvement Act (IDEA). This Act states that all children be provided with a free and appropriate public education (FAPE) in the least restrictive environment (LRE; Bowman-Kruhm, 2000). Partly as a result of IDEA, more recent trends have moved toward including students with special needs in regular education classrooms, otherwise called mainstreaming or inclusion (Fidler et al., 2002; Freeman & Hodapp, 2000; Moorcroft-Cuckle, 1993).

Mainstreaming has been found to be one of the most prominent and beneficial factors in the academic achievement of students with DS (Turner & Alborz, 2003). Similarly to typically developing children, individuals with DS vary greatly in their level of academic skill attainments (Groen, Laws, Nation, & Bishop, 2006). Some learn to read on level with their peers and develop proficiency in basic arithmetic facts. Writing is an area that can be particularly difficult for students with DS due to fine-motor skill difficulties (Rynders, 1996). Some students with DS complete high school, go on to college, and enjoy independent or supported employment as adults (Wehman, Targett, & Neufeld, 2006).

Although there is wide variety in skill levels, there are some common factors that have been found to impact academic attainment in students with DS. These include chronological age, mental age, severity of intellectual impairment, level of attentiveness, mother’s coping style, and father’s locus of control (Turner, Alborz, & Gayle, 2008). In addition to facilitating academic achievement levels, mainstreaming has also been found to strengthen social development, in particular (Buckley et al., 2006).
Social skills are exceedingly important to teachers, especially self-control and cooperation (Meier, DiPerna, & Oster, 2006). Either of these may be identified as problematic in teacher referrals of children with DS and may lead to changes in placement (Meier, DiPerna, & Oster, 2006). It is believed, however, that the removal of students with DS from mainstream settings can separate them from valuable learning environments and opportunities (Feeley & Jones, 2006). In line with this belief, it has been found that teenagers with DS in mainstream settings show fewer behavioral difficulties than those in special placements (Buckley et al., 2006).

A 1988 study of nursery school children with DS found that greater gains in numeracy and comprehension were achieved by mainstreamed versus self-contained students (Casey, Jones, Kugler, & Watkins, 1988). More recently, studies have shown that including students with DS in regular education classrooms is associated with benefits in language and memory (Laws, Byrne, & Buckley, 2000), behavior, social development, and academic progress (Buckley et al., 2006). Inclusion has also been suggested to help eliminate stereotyped views of the DS personality, discussed later in this paper (Wishart & Johnston, 1990).

Growing evidence of benefits, however, does not indicate a similar trend in teacher or peer opinion and belief regarding the matter. Wishart and Manning (1996) found that teacher trainees had mixed thoughts about the educational, social, and emotional benefits of inclusive education for students with DS. A more recent survey of the general public, as well as experienced teachers, showed that the benefits were now increasingly being recognized (Gilmore, Campbell, & Cuskelly, 2003). Only a minority of those surveyed, however, believed that the regular education classroom was the ideal
setting for students with DS (Gilmore, Campbell, & Cuskelly, 2003), despite growing evidence that mainstreaming has been shown to benefit these students (Buckley et al., 2006; Cunningham, Glenn, Lorenz, Cuckle & Shepperdson, 1998; Turner, Alborz, & Gayle, 2008).

Results of a study with non-disabled regular education students produced similar findings as the teacher studies (Gannon & McGilloway, 2009). These students reported that they would likely interact favorably with students identified with DS. They did not, however, support students with DS being mainstreamed.

Whether in self-contained or inclusive settings, teachers and school psychologists will continue to interact with students with DS. This condition is one of the easiest neurodevelopmental disorders to identify and is often recognized prior to or at the time of birth (Kozma, 2008). Therefore, whereas the purpose of psychoeducational assessment in schools oftentimes involves diagnosing a condition or disability, the purpose of this kind of evaluation is to assess strengths and weaknesses that can be utilized to inform various types of interventions (Davis, 2008).

Researchers have argued that educational strategies and interventions can be more effective when they recognize and are guided by the developmental paths associated with a particular syndrome (Vicari, 2006). Understanding the strengths and weaknesses associated with a syndrome and how they change over time can provide valuable information to interventionists. They can be used to alleviate learning difficulties and social maladjustment (Vicari, 2006). Behavioral phenotype research has begun to illuminate such developmental paths.

**Behavioral Phenotypes**
Traditionally, the field of mental retardation research has grouped individuals according to their level of impairment rather than specific etiology. Recent advances in the field of behavioral genetics have highlighted the importance of behavioral phenotypes as applied to specific syndromes (Mijovic & Turk, 2008). A behavioral phenotype refers to observable behavior characteristics of individuals with a specific genetic disorder and generally includes aspects of cognition, language, motor, and social functioning (Bhattacharyya, Sanyal, Roy, & Saha, 2009). It includes the heightened probability that a person with a specific syndrome will exhibit certain behavioral and developmental patterns as compared to others without the syndrome (Mijovic & Turk, 2008).

As such, this definition explains that because individuals with a specific syndrome share common genetic anomalies, they also may have more common physical or behavioral characteristics relative to those individuals with other causes of mental retardation. At the same time, this definition recognizes that not all individuals with a common syndrome or etiology will look and behave exactly the same way. There is as much variability within etiologies as well as between (Dykens, 1995).

As early as 1988, researchers were proclaiming the importance of differentiating among organic etiologies of mental retardation in order to gain more precise information, a better understanding of the individual condition, and to inform interventions (Burack, Hodapp, & Zigler, 1988). Currently, DS is 1 of approximately 1,500 genetic syndromes with a behavioral phenotype that has been identified (Mijovic & Turk, 2008).

A great deal of research has been conducted specifically surrounding the behavioral phenotypes of individuals with DS, perhaps because it is one of the most common syndromes overall, and the single most common chromosomal abnormality
associated with intellectual disability (Fidler & Nadel, 2007). Results appear to support a theoretical approach that people with DS do not experience just a mere slowing or retardation of normal development, but rather show a specific developmental trajectory or profile of abilities that emerges as early as age two (Fidler, Hepburn, & Rogers, 2006). The trajectory follows with a general slowing in grammar, on psychometric tests, and in adaptive behavior between the 6-11-year-old period (Dykens, Hodapp, & Evans, 1994; Hodapp, 1996), and specific strengths and weaknesses emerging in a variety of functional areas including speech, language, memory, cognition, social skills, and behavior (Vicari, 2006).

Studies in neurobiology have supported this approach with findings that certain brain structures become increasingly impaired throughout development (Fidler & Nadel, 2007). Although neurological impairments associated with anatomy, physiology, pharmacology, and behavior are likely in individuals with DS, these studies tend to follow a probabilistic approach between syndrome and outcome that parallels the one taken with behavioral phenotype research, described previously (Fidler & Nadel, 2007).

As early as 1992, researchers were recognizing and advocating for the utilization of phenotypes in intervention strategies (Hodapp & Dykens, 1992). O’Brien (1992) noted that recognizing a likely outcome of a disorder should in no way indicate a cessation of programming or treatment efforts, but alternatively, can alert an educator or clinician to a certain likely program of needs. As the DS behavioral phenotype has become clearer over the past couple of decades, researchers have been moving toward applying it to educational strategies and classroom instruction (Stephanny, Freeman, & Hodapp, 2000).
Identifying these profiles or behavioral phenotypes can be of the utmost importance in guiding the type and the timing of educational and other interventions (Dykens, 1995). Rather than being guided by the idea that all individuals with developmental disorders need uniform services, behavioral phenotype research enables services to be guided by and tailored to particular profiles of need (Mijovic & Turk, 2008). Accordingly, educators can be prepared and take a “ready stance,” in terms of predicting areas of strength and weakness, while also expecting that individual children will vary in their expression of the predisposed outcomes (Fidler & Nadel, 2007).

Phenotypes can also help families understand that certain challenges or delays in specific areas may be documented features of specific syndromes and not necessarily the result of poor parenting activities or programming (Mijovic & Turk, 2008).

Profiles of strengths and weaknesses in cognition, language, social, emotional, and behavioral domains can aid intervention efforts (Hodapp, 1996), and have been shown to influence an individual’s preference for certain leisure activities (Sellinger, Hodapp, & Dykens, 2006). The presence of a particular genetic disorder can serve to alert educators to potential behavioral profiles so they can anticipate or avoid certain problems, and be better equipped to deal with others (Hodapp & Fidler, 1999).

While researchers have been gaining information on behavioral phenotypes, evidence is also emerging that parents are knowledgeable in this area as well (Fidler, Hodapp, & Dykens, 2002). For example, Fidler, Hodapp, and Dykens (2002) found that parents of children with DS are aware of their children’s weaknesses in verbal expression, and even if already receiving services, most desired more. Additionally,
parents and professionals may consider engagement in activities tapping etiology-related strengths to be connected to fewer maladaptive behaviors (Sellinger et al., 2006).

These findings suggest that as behavioral phenotype research becomes more well-known, it will be called upon and utilized in a variety of settings by parents and professionals to best help children with DS succeed and learn. Additionally, researchers are underscoring the importance of considering age-related changes in functioning (Fidler, Barrett, & Most, 2005). As stated by Hodapp and Dykens (2005), “as we better understand the behavioral outcomes of genetic mental retardation syndromes, it becomes increasingly inaccurate to talk of a behavioral phenotype without reference to the participants’ ages” (p. 345).

**Down syndrome phenotypes.** Although there are, of course, variations in the abilities between and among individuals with DS, there is a certain pattern of strengths and weaknesses that has been identified consistently (Davis, 2008). A great deal of research has been done to document the cognitive phenotype of young people with DS. This is reflected in the finding that parents of children with DS are more knowledgeable about their children’s etiology-related strengths and weaknesses than parents of children with other syndromes (Fidler et al., 2002). A general and consistent pattern of functioning has emerged from the literature that reveals significant weaknesses in motor functioning, expressive language, verbal memory, and verbal processing, and relative strengths in social competence, receptive language, visuospatial memory, and visuospatial processing (Fidler & Nadel, 2007).

**Cognitive abilities and adaptive behavior.** Cognitive development refers to the growth of mental abilities such as information processing, thinking, reasoning, and
remembering (Buckley, 2008). Individuals with DS almost always have some degree of intellectual disability or impairment in cognitive abilities, which are generally measured by intelligence tests. DS is in fact the most common genetic form of mental retardation (McDermott, Durkin, Schupf, & Stein, 2007).

Individuals who score below 70 on tests of cognitive abilities, and have adaptive behavior deficits are considered to be mentally retarded. The term “mental retardation,” however, has been falling out of favor and has been increasingly replaced in the literature with terms such as “intellectual disability” or “cognitive impairment” (Kozma, 2008).

Research suggests that individuals with DS acquire adaptive skills in a similar sequence and according to a similar trajectory as those that are typically developing, but have substantially lower scores and show a much greater degree of variability (van Duijn, Dijkxhoorn, Scholte, & van Berckelaer-Onnes, 2010). Early development of adaptive behavior has revealed that, even as young as 2-3 years of age, children with DS show relative strengths in socialization and weaknesses in communication and motor skills (Fidler, Hepburn, & Rogers, 2006).

Age appears to play an important role in adaptive behavior, with stronger age-related gains occurring through 6 or 7 years, and a plateau or ceiling evident by about 12 years (Dykens, Hodapp, & Evans, 1994). In adulthood, it is well documented that adaptive behaviors decrease with age in the DS population and are suggested to be associated with the onset of dementia and depression, with a loss in receptive language skills being one of the earliest changes (Collacott & Cooper, 1997; Maata, Tervo-Maata, Taanila, Kaski, & Iivanainen, 2006).
In terms of cognitive abilities, the majority of children with Down syndrome score between 40 and 69 on tests of cognitive abilities, indicating mild to moderate levels of intellectual disability (Tocci, 2000). Generally in line with this finding, Maatta, Tervo-Maatta, Taanila, Kaski, and Iivanainen (2006), in a study involving 129 individuals ages 0-66.7 years, found 19% to have mild, 30% to have moderate, 33% to have severe, and 18% to have profound levels of intellectual disability. In a larger study, Myers and Pueschel (1991) found similar results. Mild intellectual disability occurred in 17% of the sample, moderate in 43%, and severely/profoundly combined in 40% of the sample.

Beginning as early as the first year of life, there is generally a decline in the IQ of babies with DS in comparison to those that are typically developing. This decline represents a slowing in development rather than a deterioration of functioning, and often continues throughout childhood and adolescence (Tsao & Kindelberger, 2009). Additionally, females with DS have been found to have better cognitive abilities than men and to display less severe behavioural problems (Maatta, Tervo-Maatta, Taanila, Kaski, & Iivanainen, 2006). Although this suggests a possible relationship between IQ and behavior, Dykens, Shah, Sagun, Beck, and King (2002) found no significant correlations between IQ and scores on any of the domains of the Child Behavior Checklist (CBCL) for children with DS between the ages of 4 and 19 years. Deficits in adaptive behaviors, however, as measured by the Adaptive Behavior Scale (ABS) have been found to be associated with behaviour disorders (McCarthy, 2008).

Cognitive abilities of individuals with DS have been extensively researched and a general pattern of functioning has emerged. Broadly, performance scores are generally
higher than verbal scores. Furthermore, as individuals with DS age, verbal scores decline more than performance scores, a pattern that is not typical in the general population (Carr, 2005). In terms of information processing, individuals with DS generally experience limitations in comparison to the general population (Silverman, 2007). Within the DS phenotype, they tend to exhibit strengths in visual processing and visuospatial memory. The visuospatial memory strengths are more prominent during sequential tasks, which involve processing one item at a time, rather than simultaneous tasks, which involve processing various items or stimuli (Lanfranchi, Carretti, Spano, & Cornoldi, 2009).

Individuals with DS also tend to display weaknesses in auditory processing, as well as explicit and verbal memory (Fidler, 2006). The verbal working memory deficits exhibited by students with DS have been found to exist independent of the general language impairments often found in this population, and to become larger as the degree of executive or attentional control of the task increases (Lanfranchi, Jerman, & Vianello, 2009). Additionally, research suggests that some aspects of visual processing including visual memory, visual-motor integration, and visual imitation are stronger in older children and young adults with DS, suggesting a trajectory that might vary with age (Fidler, 2006).

Although there has been no consensus as to the specific underlying processes, research suggests a link between memory and language weaknesses, and the two may have a bidirectional relationship (Silverman, 2007). Connors, Rosenquist, Arnett, Moore, and Hume (2008) hypothesized that by improving the historically impaired memory span of individuals with DS, language and reading interventions could be greatly enabled.
They investigated and found that children with DS were able to improve their auditory verbal memory span with home-based rehearsal training, which involved the rehearsal of increasingly larger lists of both words and digits to improve memory span.

Knowing the common difficulties and strengths in cognitive abilities can aid educators in helping students be successful. For example, they might use verbally-based instruction that includes visual supports when teaching children with DS. Aware of the general visual versus auditory perceptual strengths of students with DS, Trezise, Gray, and Sheppard (2008) conducted a study comparing the attention of these students to others with nonspecific intellectual disabilities (NSID). They used two versions of the sustained attention to response test (SART); one visual and one auditory. They found that the DS students’ performance was superior on the visual form of assessment over the auditory version and that the differences in performance did not occur in the NSID group. Their results suggested that individuals with DS may benefit from educational material presented in a visual medium.

Additionally, Wang, Bernas, and Eberhard (2001) found that when teachers used visual gestures in addition to speech when teaching or giving directions, 7-year old students with DS were more responsive to directions, focused longer on class activities, and were more successful in accomplishing tasks. Students with DS may also benefit when educators provide more prompts or allow for a greater wait time on processing tasks (Fidler & Nadel, 2007). The reason for this is because it has been suggested that neurologically-based differences in attention regulation may produce slower reactions and orientation behaviors (Moore, Oates, Hobson, & Goodwin, 2002).
The visual and verbal processing skill patterns in students with DS have particular effects on their abilities, and some research has found evidence for using their strengths to build other skills. In the area of reading, for example, strengths in visual processing have been linked with benefits of sight-word identification and sight-word vocabulary methods (Kumin, 2003). Weaknesses in verbal processing have been linked to weaknesses in word attack skills (Kumin, 2003).

In the area of speech therapy, research has shown that visual supplementation of auditory feedback is especially beneficial for children with DS as a result of their relative strengths in visual versus auditory processing (Wood, Wishart, Hardcastle, Cleland, & Timmins, 2009). An electropalatography (EPG), which visually displays the timing and location of the tongue’s contact with the hard palate during speech, is an example of such visual supplementation. A child can watch the screen as he or she moves his or her mouth and tongue, and attempt to copy a desired speech sound or articulation pattern (Wood et al., 2009).

Knowledge of cognitive weaknesses can also be supported in other areas. Young children with DS are likely to experience instability of acquisition, meaning that performance after acquiring a certain skill may be highly variable and perhaps compounded by motivational difficulties (Fidler & Nadel, 2007). Knowledge of the instability of acquisition can heighten an educator’s awareness that a child with DS may need frequent review of materials and recurrent monitoring of skill performance (Fidler & Nadel, 2007; Tocci, 2000).

**Language and communication.** Language and communication refer to the ways in which a person conveys a message. It may include nonverbal methods such as
gesturing, using facial expressions, as well as using speech (Buckley, 2008). Communication skills are essential to societal participation. The ability or inability to express oneself can have a significant impact on mental health. The traditional view of individuals with DS as being generally incapacitated and poorly functioning in a variety of areas has changed to a more modern and accurate view. They are now perceived as individuals who can learn to speak and express themselves functionally when properly cared for and educated (Rondal, 1999).

One aspect of language that seems to be strong in children with DS is pragmatics or the social use of language. This includes both verbal skills such as using social greetings, and nonverbal skills such as using gestures and facial expressions (Kumin, 1994). In fact, children with DS have been found to display significantly more nonverbal social interaction behaviors (including eliciting the attention or physical contact of an experimenter and displaying turn-taking behaviors) than their typically developing mental-age matched counterparts (Mundy, Sigman, Kasari, & Yirmiya, 1988). Children with DS are generally able to participate in functional conversations with adults and peers. They can follow a conversational topic, switch topics when needed, and take turns contributing appropriately (Hodapp, 1996).

Although individuals with DS may exhibit a personal pattern of strengths and weaknesses, generally they display a weakness in articulation and expressive language (McGuire & Chicoine, 2006), which emerges in early childhood and correlates positively with early nonverbal requesting behaviors (Mundy, Sigman, Kasari, & Yirmiya, 1988). This weakness is specific to youngsters with DS and may become more visible as they transition from preschool to middle childhood and adolescence (Fidler & Nadel, 2007).
Children with DS are generally better at comprehending language than they are at expressing language (Fidler et al., 2006; Fidler, Philofsky, & Hepburn, 2007). Articulation is often very poor, and can be exacerbated by the high prevalence of an enlarged tongue, hearing problems, or differences in the shape of their oral cavities (Hodapp, 1996).

Students with DS often have relative weaknesses in the areas of syntax/morphosyntax (the grammar or structure of language) and semantics (the usage of words and understanding of vocabulary) compared to their typically developing peers. Even when matched on text comprehension and vocabulary knowledge, children with DS score significantly lower than typically developing children on sentence comprehension. This profile led to the helpful discovery that providing a context for children with DS can greatly enhance their sentence processing capabilities (Levorato, Roch, & Beltrame, 2009). Context, consisting of three or four short and simple sentences placed before a target sentence, provides these children with a way to connect text to previous knowledge and improve their comprehension (Levorato, Roch, & Beltrame, 2009).

Although children with DS generally speak their first words and use multiword combinations at approximately the same age as their typically developing peers, their early spoken words accumulate more slowly, are less intelligible, and their sentence length and complexity are slower to develop once they emerge (Chapman, 1997). Children with DS rarely use prepositions or conjunctions, and even as adolescents and adults, many do not progress beyond the 3-4-year-old level in terms of grammatical abilities (Hodapp, 1996).
It appears that patterns of language development including areas of strength and weakness can be, in part, etiology-specific. Although eligibility for speech/language services is currently not automatically provided based on the presence of DS and the associated likelihood of phenotypic weaknesses, some parents and researchers have expressed such desires (Fidler et al., 2007). What many of these advocates have taken is an approach of anticipatory guidance in which vulnerabilities linked to a child’s syndrome are closely monitored and delays are more immediately detected (Fidler et al., 2007).

As a result of the well-researched patterns of general communication strengths and weaknesses, many preventative programs and intervention efforts have been proposed. An example of such a program is called Total Communication, which is based upon the expressive language difficulties in many individuals with DS (Kumin, 2003). Total Communication is the combined use of signs or gestures with verbal speech. This preventative approach has been demonstrated to help in the acquisition of speech and the communicative abilities of youngsters with DS (Kumin, 2003). As is the case with typically developing children, it has been found that the use of nonverbal communication abilities or gestures (e.g., pointing, showing, and waving) is an important base for language acquisition and development (Zampini, 2009). The use of gestures may facilitate lexical development, rather than hinder it, as is commonly believed (Zampini, 2009).

Total Communication is suggested for children around the age of one. Additional preventative strategies that have been proposed include teaching social greetings when children are at an appropriate age, but before they display problems with this (Kumin,
1994), strengthening speech development, targeting component processes such as memory, using alternative modes of communication, and encouraging means-end thinking (Fidler et al., 2007). With older children, remediation is generally used as an intervention approach. This method includes a response to a documented speech or language problem (Kumin, 1994).

Rondal (1999) suggested that interventionists are most successful when they utilize methods and programs that take a child’s etiology into account and tailor their efforts accordingly. Fidler and Nadel (2007) argued that by taking weaknesses in speech production and intelligibility into account for youngsters with DS, educators can also be aware of indirect motivational and social influences. For example, the children may get frustrated at having to repeat themselves or become more quickly frustrated than other learners at being prompted to produce lengthy sentences. By being aware of weaknesses in expressive language, educators can teach the child at an appropriate rather than underestimated and less than stimulating level (Roberts, Price, & Malkin, 2007).

In sum, it has been found that individuals with DS generally display cognitive strengths in performance skills rather than verbal skills. They are likely to display strengths in visual processing, visuospatial memory, and visual attention, and weaknesses in verbal and auditory processing, verbal memory, and auditory attention. In terms of language and communication, the DS phenotype includes strong pragmatic skills and receptive language, and weaker abilities in articulation, syntax, semantics, and expressive language. Strengths in cognition and language have been incorporated by interventionists and used to generate educational recommendations.
Social, emotional, and behavioral phenotypes and mental health in down syndrome. Social and emotional functioning, behavior, and mental health will be discussed together because they are all closely related areas. Challenging or difficult behaviors can often be a symptom of poor mental health and can constitute the basis of diagnoses involving emotional or psychiatric disturbances (Menolascino, 1965). They can also affect educational placements, social opportunities (Buckley et al., 2006), social skill acquisition, and performance (Lane, Menzies, Barton-Arwood, Doukas, & Munton, 2005). Emotional difficulties may increase stress levels and the likelihood of depression, and may produce cognitive and behavior changes that negatively affect social interactions with others (Masten & Curtis, 2000). In turn, the assessment of social skills may be inferred from the absence of social or emotional problems (Ogden, 2003).

Social functioning is generally viewed as an area of strength for individuals with DS, and is said to buffer against maladaptive behaviors (Dykens, 2000). Research, however suggests patterns of both strengths and weaknesses in social, emotional, and behavioral functioning, as well as mental health (Bhattacharyya et al., 2009; Fidler, Most, Booth-LaForce, & Kelly, 2008; Jahromi, Gulsrud, & Kasari, 2008).

It is a common belief that individuals with DS are always happy and stress-free (McGuire & Chicoine, 2006). They are commonly described as easy-going, affectionate, and pleasant (Lecavalier & Tasse, 2005), and, as toddlers, have been found to experience a more positive mood than other children (Gunn & Berry, 1985). Youngsters with DS can indeed exhibit a friendly, sociable, and charming personality (Gunn & Cuskelly, 1991), but research has found evidence that is inconsistent with this description (Bridges & Cicchetti, 1988). These individuals have fewer social and behavioral development
problems when compared with other groups of children with neurodevelopmental disorders such as Williams syndrome or Prader-Willi syndrome. They do, however, remain at risk for many behavioral problems in comparison to their typically developing peers (Davis, 2008). They also experience age-related changes in each of these closely related areas.

**Social and emotional functioning.** Social/emotional development may be influenced in part by personality and temperament. It includes learning how to understand and get along with other people, how to make friends, behave in ways that are socially acceptable, and understand and manage feelings (Buckley, 2008). In 1953, Blacketer-Simmonds (1953) summarized what he believed to be the common impression of individuals with DS as “they are almost invariably lovable little creatures with very attractive peculiarities and few, if any, of the bad behaviour traits and undesirable habits so commonly found amongst other defectives” (p. 702). Schlottmann and Anderson (1975) observed children with DS in a free-play situation and also saw evidence of this sociability. They found that the DS children were more likely to participate with other children in activities involving toys and other objects than non-DS children. They also found, however, that the DS children were more likely to display negative verbal behavior, such as reprimands, and to indicate their dislike or dissatisfaction.

Many years later, Wishart and Johnston (1990) stipulated that the stereotypical peculiarities of children with DS came from clinical impressions of cases rather than direct study. They found that the more experience and contact an individual had with a child with DS, the less he or she adhered to the traditional stereotyped personality. Iarocci, Virji-Babul, and Reebye (2006) added that such a stereotype is dangerous
because it can detract attention away from the large research base showing atypicalities and difficulties in social behavior and interpersonal functioning.

There is research suggesting that individuals with DS display strengths in various areas of social competence. For example, Fidler et al. (2008) examined general developmental delays in young babies and toddlers with DS using the Bayley Scales of Infant Development at both 12 and 30 months of age. They found that the children with DS made greater gains in the areas of orientation and engagement at the 30 month stage than children in a mixed developmental delays comparison group. Item analysis determined that the questions driving the increased scores included one pertaining to the extent to which the child engaged the examiner or caregiver in social interaction, acceptance of the examiner, and level of child fear when the examiner made a social or physical approach toward him or her.

Fidler et al. (2006) also noted significantly higher socialization (especially on play and leisure subscales) scores on the Vineland Adaptive Behaviour Scales for toddlers with DS compared to typically developing and nonspecifically delayed comparison groups. Another study included a wider age range (4-49 years) and different comparison groups (Prader-Willi and William’s syndrome) yet found overall social competence (number and quality of various relationships) to be highest in the group with DS (Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004).

Clearly, there is some evidence of social strengths in the DS population. In fact, it has been suggested that these social strengths are so prominent that they may even interfere with other areas of functioning. Specifically, Wishart (2007) has suggested that researchers and educators might be mistaking heightened sociability for good socio-
cognitive skills and interpersonal understanding. For example, sociability might be used as a diversion from tasks. Kasari and Freeman (2001) found that during puzzle tasks, children with DS were more socially oriented than their typically developing counterparts. They looked to the experimenter more frequently and asked for help more often. They were, however, also less persistent, taking longer to complete the tasks. From this perspective, sociability may be viewed as diversion from tasks, and thus a weakness or a hindrance to instruction. Coupled with generally poor motivation and persistence, and an over-reliance on others for assistance in this population, it seems as though educators may need to help channel the social behaviors of children with DS into paths that would be more conducive to learning, thus utilizing strengths to build upon weaknesses (Wishart, 1993).

Despite some evidence of social strengths, there are some researchers that have found that individuals with DS are certainly not socially problem-free. Bridges and Cicchetti (1988) surveyed mothers with the Infant Temperament Questionnaire (ITQ). They found that mothers of infants with DS did not rate their children as easier as or more placid than typically developing infants. In fact, a greater percentage of children with DS were found to be in the “difficult” temperament category and specifically were found to be less likely to approach, for example a new person, place, or toy, than typically developing infants.

Sinson and Wetherick (1981) conducted observations of nursery-school-age DS and typically developing children. They found that, despite repeated attempts of typically developing children to decrease physical distance and establish mutual eye-contact, the children with DS did not reciprocate and thus eventually became “isolates.” Years later,
Virji-Babul, Hovorka, and Jobling (2006) studied the interaction behaviors of 6-7-year-old children with DS at a playground, and found similar results. Namely, the children with DS spent a greater amount of time in solitary, motor-based activities rather than social interaction activities with peers.

In comparison to typically developing peers, toddlers and young children with DS have also been found to display more time spent in passivity (inactive or self-absorbed) and in extended free-play situations. Such passivity may include, for example, staring into space or wandering aimlessly (Inman-Linn, Goodman, & Lloyds-Lender, 2000). In line with this finding, older children and adults with DS have been found to participate in a great deal of passive rather than active, and non-community based social and leisure activities (Putnam, Pueschel, & Holman, 1988).

Most of the studies previously discussed have involved typically developing peers as comparison groups. Even when compared to other children with disabilities, rather than typically developing peers, results are mixed. One study investigated the peer interactions of school-age children with autism, DS, and developmental delays (Sigman & Ruskin, 1999). Based upon the early stereotypes, the researchers hypothesized that the children with DS would be exceedingly social and positive. In contrast, they found that the children with DS were as likely to be engaged in an organized social game or interaction as they were to be isolated or alone. In addition, they had significantly less social positive play (highly social play behavior co-occurring with positive affect) than the developmentally delayed group (Sigman & Ruskin, 1999).

As youngsters with DS mature from infancy to toddlerhood, they may display emerging social strengths in the area of relatedness, specifically social orienting and
social engagement, yet not in other areas of social development, such as emotion regulation (Fidler et al., 2008) and emotion recognition (Williams, Wishart, Pitcairn, & Willis, 2005). Emotion regulation is an aspect of social-emotional functioning that involves the ability to modulate or control one’s own emotions. Research on emotion regulation or competence in children with DS has shown that, as compared to their typically developing peers, they display significantly higher levels of frustration whereas their typically developing counterparts exhibit more goal-directed strategies and cognitive self-soothing behaviors (Jahromi, Gulsrud, & Kasari, 2008).

It has been observed that individuals with DS, however, may use some behaviors originally thought of as problematic, as self-soothers. For example, Barrett and Fidler (2008) found that, in a sample of children, adolescents, and young adults with DS, the use of tonguing (protruding or thrusting the tongue out of the mouth) was found to moderate the relationship between negative mood and stressful child behavior. Thus, it served a positive, rather than a negative function for these individuals.

In regard to emotion recognition, children with DS have a more difficult time verbally labeling emotions in stories, and recognizing and processing the emotional expressions of others in comparison to their typically developing peers (Williams et al., 2005). They have particular difficulties interpreting neutral facial expressions and also have a tendency to judge facial expressions in an overly positive manner (Hippolyte, Barisnikov, Van der Linden, & Detraux, 2009). These deficits have been found to persist despite the progression of time, cognitive skills, and language abilities (Kasari, Freeman, & Hughes, 2001).
Wishart, Cebula, Willis, and Pitcairn (2007) also found evidence supporting this weakness when they conducted a study comparing the ability of children to match pictures to emotional expressions. They found the DS group to perform significantly more poorly in comparison to a typically developing group, with the expression of fear being a particularly difficult area for them to discern. The authors noted the importance of recognizing emotional expressions for interpersonal functioning and suggested that, although the stereotype of children with DS as highly sociable still prevails, their results suggested the need for support in certain areas.

Interestingly, in light of the weaknesses found in emotion recognition, children with DS are significantly more likely than children with nonspecific mental retardation or typically developing children to respond to the distress of others in a prosocial manner (Kasari, Freeman, & Bass, 2003). Namely, they are more likely to offer physical comfort, even though they are unlikely to display any emotional or affective responses. They are also significantly less likely to empathize or feel the same emotion as others in more abstract situations involving higher-order thinking skills (Kasari, Freeman, & Bass, 2003), such as social referencing. In a study comparing typically developing children to children with DS, Kasari, Freeman, Mundy, and Sigman (1995) found that the DS children exhibited less shifting of attention between a person delivering an emotional message about a stimulus (i.e., a robot), and the stimulus itself. The authors concluded that the children with DS were less able to utilize social referencing in order to accurately appraise whether a situation was safe or dangerous.

In addition to the mixed results regarding the social and emotional functioning of individuals with DS in general, another area of concern involves the changing levels of
sociability with age. Despite evidence of some social strengths relative to others with various forms of intellectual disabilities (ID), and friendship making in early to middle childhood, it has been suggested that sociability, including number of friends, as well as social visits and interactions, decreases with age for the DS population (Carr, 2008). Brown, Greer, Aylward, and Hunt (2001) found this decline to be significantly greater when individuals were situated in home settings as opposed to institutional settings. They suggested that this may be related to the structured daily routines, and promotion of independence and social/adaptive functioning likely to be found in institutional settings.

Cuckle and Wilson (2002) have suggested that parents may need to play a more active role in the organization of social activities and friendship maintenance for older children and adolescents with DS. Schools may need to provide support for social activities during the secondary years when age-appropriate friendships are often difficult for mainstreamed individuals with DS to sustain (Cuckle & Wilson, 2002). Perera (1999) insisted that in order to provide programs that improve quality of life for these individuals, a holistic approach must be taken with collaboration and cooperation between parents and professionals. School psychologists and other school professionals are in a position to provide such valuable assistance.

On the other hand, there is also research that suggests individuals with DS are socially adept. Adolescents and young adults with DS are using technological social platforms to expand and maintain friendships (Leonard et al., 2002). For example, adolescents and adults with DS are using the internet and personal home pages to display information about their own friendships, such as who they are and what types of activities they enjoy, and also to make and maintain new friendships with other disabled as well as
non-disabled individuals (Seale, 2002). Sellinger, Hodapp, and Dykens (2006) reported increases in the amount of time that individuals with DS go out with friends and speak to friends on the phone as they age. Rosner, Hodapp, Fidler, Sagun, and Dykens (2004) also found a positive correlation between age and scores on the Child Behavior Checklist domain of “social competence” which reflects frequency and quality of a variety of activities and relationships.

The research appears to contain many contradictory findings. This is perhaps a result of the variety of ways in which these behaviors have been measured, the many definitions of target behaviors that have been created, and the assortment of comparison groups used. Methods of collecting data over the years have included clinical impressions, direct observations, developmental assessment measures, and behavioral rating scales, all of which tend to be deficit-based. Within the very broad domains of social, emotional, and behavioral functioning, there are a multitude of sub-areas and related categories (e.g., sociability versus engagement versus social competence versus friendship-making, emotion regulation versus emotion recognition versus social referencing). All of these may relate to each other but be functionally and visibly different. Additionally, there has been a great deal of variety in the types of comparison groups (e.g., typically developing, mixed developmental delays, autism), matching criteria (e.g., chronological age, mental age, vocabulary development), and age groups that have been included in studies.

**Behavior and mental health.** Dykens (2007) reported that individuals with intellectual disabilities overall are at much higher risk for behavioral, emotional, and psychiatric problems than the general population. It has been suggested that low
intelligence creates both unique adjustment problems as well as a limited ability to solve those problems, which may contribute to an emotional vulnerability (Reiss, Levitan, & McNally, 1982). Although children with DS are generally at lower risk for significant psychopathology or maladaptive behaviors than other groups of children with intellectual disabilities, they display more problematic behaviors than their siblings or typically developing peers (Coe et al., 1999; Cuskelley & Dadds, 1992; Gath & Gumley, 1986, 1987; Myers & Pueschel, 1991; Stores, Stores, Fellows, & Buckley, 1998).

Mental health and behavioral problems affect a considerable proportion of people with DS at all ages, and these in turn may affect other individuals in their lives (Maatta, Tervo-Maatta, Taanila, Kaski, & Iivanainen, 2006). In 2006, from a sample of 129 individuals with DS from ages 0-66.7 years, Maata, Tervo-Maatta, Taanila, kaski, and Iivanainen found 55% to display some degree of behavioral problems (including aggression and irritability) and 39% to have some degree of mental health difficulties (including depression, anxiety, self-injury, and psychoses). A larger study (497 participants) found 22.1% of individuals with DS to have psychiatric disorders including disruptive disorders, anxiety disorders, gastrointestinal disorders, repetitive behaviors, and affective disorders (Myers & Pueschel, 1991). In line with this second study, and more recently, Mantry, Cooper, Smiley, Morrison, Allan, Williamson, Finlayson, and Jackson (2008) found 23.7% of their sample to have mental illness including problem behaviors, organic disorders, affective, and anxiety disorders.

Psychopathology in childhood specifically has been linked to severe behavior disorders in adulthood (McCarthy, 2008). Problematic behaviors in childhood have been linked to decreased academic competence and achievement in adolescence (Gilmore &
Cuskelly, 2009) as well as higher levels of maternal stress (Stores et al., 1998).

Generally, socially acceptable behavior is necessary for appropriate functioning in all areas of society including school, employment, and recreation (Pueschel, Bernier, & Pezzullo, 1991). Research suggests that children generally fare better than adults (Dykens, 2006), females generally fare better than males (Begley, 1999; Leonard et al., 2002; Lund, 1988), and that the presence of DS constitutes a predisposition to a range of maladaptive behaviors and disorders that varies from individuals with other mental handicaps (Collacott, Cooper, & McGrother, 1992).

Children with DS are generally less likely than other children with mental retardation to display psychoses (Hodapp, 1996), but are more likely than typically developing children to display problem behaviors (Turner & Sloper, 1996). They are more likely than other children to display disruptive behavior disorders (including conduct/oppositional and aggressive behaviors), disobedience, anxiety disorders, repetitive behaviors, stubbornness, and difficulties concentrating (Dykens & Kasari, 1997; Gath & Gumley, 1986; Myers & Pueschel, 1991). As children approach adolescence, however, concentration seems to improve (Pary, 2004) and the profile of behavior appears to shift.

Pueschel (1996) asserted that a crucial factor for healthy development during adolescence for people with DS is developing and maintaining self-acceptance and self-esteem, which are believed to thrive when young people are encouraged to build upon their competencies or strengths. Self-esteem is a construct that is also strongly related to mental health. McGuire and Chicoine (2006) asserted that there are four key factors in the development of self-esteem in individuals with DS: self-acceptance, competence,
understanding of one’s own talents and strengths, and the perception that one is loved and is lovable. Generally, these constructs have been found to be positive for this group of individuals (Dykens, Schwenk, Maxwell, & Myatt, 2007; Glenn & Cunningham, 2001), to be higher for females than males, and to increase with age (Begley, 1999).

Given these findings, it has been found that as children with DS reach adolescence, they experience a decline in externalizing behaviors such as aggression and delinquency, and a simultaneous increase in internalizing behaviors. Specifically, they become increasingly withdrawn, often wanting to be alone and not wanting to talk to others (Dykens & Kasari, 1997). Coe et al. (1999) surveyed parents and teachers of children and teenagers with DS in reference to behavior problems. Both groups rated higher levels of social withdrawal in the DS group as compared to the control group of same-age peers. A later study found that as children with DS age, their smiling frequency and duration decrease whereas their anxiety and withdrawal increase, as indicated by parent reports (Fidler, Barrett, & Most, 2005).

Interestingly, research on typically developing students has found differences in externalizing and internalizing behaviors associated with different patterns of social skills. Specifically, high externalizing behaviors tend to be associated with low cooperation and self-control skills, and high internalizing behaviors tend to be associated with low levels of assertive skills as measured by the Social Skills Rating System (Ogden, 2003). It is not known whether this trend exists for the DS population. The shift in behavior and sociability seen in DS children may be related to, if not responsible for, shifting parent perceptions that their children are less rewarding to them in the adolescent years. These shifting trends in emotional and behavioral functioning have been suggested
to be early harbingers of more significant mental health concerns among adults with DS (Dykens, Shah, Sagun, Beck, & King, 2002).

Adults with DS appear to be relatively protected from schizophrenia, personality and conduct disorder (Collacott, Cooper, Branford, & McGrother, 1998), as well as poor mental health in general compared to other adults with intellectual disabilities (Lund, 1988; Mantry et al., 2008). The main concerns for individuals with DS during this stage of life are dementia, Alzheimer’s disease, and depression (Collacott, Cooper, & McGrother, 1992; Maatta et al., 2006; Mantry et al.). The percentage of older adults with DS and Alzheimer’s Disease is higher than in the general population, and the age of onset is earlier in DS (Nieuwenhuis-Mark, 2009). Dramatic increases occur in prevalence after 50 years of age (Prasher, 1995).

It appears that symptoms of dementia and early symptoms of Alzheimer’s disease in adults with DS often include social, emotional, behavioral, and personality changes (Ball et al., 2006). The typical memory deficits seen in the general population are not apparent until later in the course of the disease (Nieuwenhuis-Mark, 2009). Symptoms associated with dementia and early Alzheimer’s disease include depression, dysphoric/low mood, restlessness, excessive overactivity and uncooperative behavior, disturbed sleep, indifference or apathy, and decreased pragmatic skills or social discourse (Cooper & Prasher, 1998; Nelson, Orme, Osann, and Lott, 2001). Similarly, decreasing socialization skills have been found in individuals referred for dementia assessments (Adams et al., 2008).

The presence of Alzheimer’s disease in the DS population is strongly associated with a history of depression (Coppus et al., 2006; Nieuwenhuis-Mark, 2009; Prasher,
1995), and as a result of the varied symptomology of the disease, it is often difficult to
differentiate between a diagnosis of Alzheimer’s disease and depression (Hodapp, 1996).
Also highly associated with depression, and unfortunately common in the DS adult
population, are loneliness and social isolation (Ailey, Miller, Heller, & Smith, 2006).
Lunsky (2003) found that individuals with intellectual disabilities scoring high on
depression measures were also more likely to report experiencing loneliness at home and
at work as well as problems getting along with family members.

Although there is a great deal of research on individuals with DS both at early-
middle childhood and adulthood, much less is known at adolescence (Ailey et al., 2006;
Dykens, 2007; Dykens & Kasari, 1997; Nelson, Orme, Osann, & Lott, 2001).
Adolescence presents a challenging time for most individuals and possibly more so for
young people with DS. It is a time of rapid change and subsequent increases in stress that
can heighten the likelihood of an individual developing a mental illness (McGuire &
Chicoine, 2006). Depression and withdrawal may emerge in teens with DS and other
conditions including health and sensory problems can become compounded by the stress
of adolescence (McGuire & Chicoine, 2006). As individuals with DS age, they are also
increasingly at-risk for certain behavioral and psychiatric problems. These include
problems that may be associated with Alzheimer’s disorder such as agitation, depression,
and anger (Davis, 2008).

Whereas children with DS tend to fare pretty well in terms of problem behaviors
and psychopathology, by adulthood they are at significant risk for depression, dementia
and Alzheimer’s disease. Even if a young person with DS does not appear to have any
behavioral or mental health concerns, a social-emotional evaluation can be valuable for prevention (McGuire & Chicoine, 2006).

Phenotypic expressions emerge through a complex developmental process whereas strengths and weaknesses may become more pronounced with time. This is important because it suggests that there may be crucial opportunities to intervene and specific ways in which to intervene in order to prevent such pronounced discrepancies in functioning or skills (Fidler & Nadel, 2007). Whereas risk factors for psychopathology exist and include, for example, life stressors and family history of psychiatric disorders, Dykens (2007) suggested that certain features of DS, such as personal strengths, may serve as protective factors buffering against maladaptive behavioral tendencies and psychopathology.

**Positive Psychology**

Traditionally, the field of psychology has been largely focused on deficits and weaknesses. Although this emphasis on deficits has led to the successful identification and amelioration of many disorders and psychopathologies, it has lagged behind in identifying and enhancing human strengths (Seligman, Rashid, & Parks, 2006). Recently there has been a rapidly expanding renewed interest in the field of positive psychology which involves the scientific study of human strengths and virtues (Faller, 2001). This interest is not only evident in the field of psychology, but also social work and other disciplines (Russo, 1999). It recognizes that the field should not only take an interest in remediating what is wrong or deficient in individuals, but also in supporting, strengthening, and utilizing what is right or what is strong (Park & Peterson, 2008). This focus on building strengths and preventing problems is at the forefront of positive
psychology and has taken hold in the field of school psychology (Jimerson, Sharkey, Nyborg, & Furlong, 2004).

Historically, school psychology approaches to working with children and families have mirrored traditional psychology approaches, focusing on disturbance, problems, or maladjustment. The positive psychology approach, however, maintains that true happiness and mental well-being in children involves more than just identifying and focusing on problems. Terjesen, Jacofsky, Froh, and DiGiuseppe (2004) have proposed positive psychology as a way to help change the traditional focus on deficits. Positive psychology has thus been increasingly proposed for use in schools in a variety of ways including consultation, prevention, intervention, and assessment.

Akin-Little, Little, and Delligatti (2004) suggested a preventative model of school consultation that incorporates positive psychology concepts. They hypothesize that by integrating mental health and behavioral consultation approaches, school psychologists can help develop and foster a consultee’s positive psychological characteristics and coping strategies in order to improve his or her personal and professional functioning. In this way, school psychologists can help teachers and other school personnel identify and strengthen their own personal characteristics before they develop maladaptive patterns of interacting with students. Meyers, Meyers, and Grogg (2004) believe that by integrating positive psychology concepts into consultation and conceptualizing development from a wellness perspective, school psychology consultants can promulgate school contexts that build on positive attributes and are most empowering to learners.
**Strength-based assessment.** The inclusion of strength-based measures in assessment is another way that positive psychology is impacting the field of school psychology. Epstein (2004) noted that:

Strength-based assessment is defined as the measurement of those emotional and behavioral skills, competencies, and characteristics that create a sense of personal accomplishment; contribute to satisfying relationships with family members, peers, and adults; enhance one’s ability to deal with adversity and stress; and promote one’s personal, social, and academic development. In a sense, strength-based assessment measures the positive emotions, behaviors, and aspects of an individual’s life (p. 4).

Strength-based assessment ensures consideration of a variety of components including resources both within an individual and his or her environment, supporting an ecological orientation (Buckley & Epstein, 2004), and a holistic view of the child (Nickerson, 2007). The examination of strengths and weaknesses is an essential and embedded part of psychoeducational assessment and has been routinely included in Individualized Education Programs (IEPs; Rhee, Furlong, Turner, & Harari, 2001). The use of strength-based assessment in the development of these programs for students with disabilities became mandated in 2004 as part of the reauthorization of the Individuals with Disabilities Education Act (Nickerson, 2007).

Investigating and communicating strengths can serve to improve rapport with students and families (Beaver, 2008). Positive relationships are likely to emerge when the focus of interactions is on what the child does well, or how to increase the child’s strengths (Buckley & Epstein, 2004). Additionally, the resulting development of
intervention practices based on strength-building rather than flaw-fixing can also be beneficial for school personnel. Rather than facilitating a sense of being overwhelmed and feeling hopeless, it can raise hope, optimism, and motivation for change (Rhee et al., 2001).

Strengths have been linked to high academic achievement (Farmer et al., 2005), greater life satisfaction, and elevated well-being, as well as few disciplinary or behavioral problems (Albrecht & Braaten, 2008). Park and Peterson (2008) asserted that once strengths are identified, they should be incorporated into programming and treatments. Such strengths can serve to expand and inform remediation methods by providing a smooth link to intervention ideas designed to develop or reinforce skills rather than reduce problems (Nickerson, 2007). The information collected by strength-based assessment measures is likely to enhance the feasibility and success of such interventions by identifying what the student does well, his or her likes and dislikes, and with whom he or she shares a close relationship (Buckley & Epstein, 2004).

Strength-based assessment has been used largely with children who have EBD and learning disabilities (LD), and for the purpose of identification or diagnosis. For example, the Behavioral and Emotional Rating Scale (BERS) was found to effectively discriminate between students with EBD and nondisabled students. The BERS also found distinct patterns of strengths that differentiated the three groups; nondisabled, EBD, and LD. Although students with LD were found to have statistically significantly lower strength scores than nondisabled students, they were generally only slightly below the average standard score and thus were not perceived as seriously strength-deficient (Reid, Epstein, Pastor, & Ryser, 2000).
Levels of child strengths, as measured by the BERS, have been found to be significantly associated with the level of restrictiveness of placement in a population of students with EBD; namely, the greater the strengths, the least restrictive the placement (Oswald et al., 2001). Another study determined that children and adolescents who were given assessments guided by the BERS versus the usual deficit-based measures experienced more positive outcomes (including behavior, social, and emotional functioning) when their treating therapist had strong strength-based attitudes and practices (Cox, 2006).

Some research has begun to expand the function of strength-based assessment to include other groups of children and other purposes. Epstein, Rudolph, and Epstein (2000) explained how it can be used with a student with mental health problems and environmental stressors to create a transition plan to a less restrictive setting. Cosden, Koegel, Koegel, Greenwell, and Klein (2006) suggested that using strength-based assessments with children with autism spectrum disorders would contribute to the success of interventions and support positive, working relationships with parents and caregivers, especially considering the stress and uncertainty associated with those disorders.

Farmer et al. (2005) investigated characteristics associated with high and low strength scores in at-risk African American adolescents. Among their results, they found that boys with low strength scores were likely to be socially isolated and placed in alternative education programs. Girls with low strength scores were likely to have internalizing and attention problems. Overall, their results suggested that a focus on strengths may have great utility for preventing mental health and associated problems in
generally at-risk youth, as well as providing critical information to guide interventions aimed at enhancing natural supports and competencies.

School psychologists routinely collect information from various informants regarding a child’s behavior and functioning across settings. Rating scales have an influential impact on assessments (Buckley & Epstein, 2004), and although there are a variety of ways in which to collect information for social-emotional assessments of children and youth (e.g., naturalistic observation, interviewing, projective-expressive techniques), it has been argued that rating scales are the clear choice, especially for assessing social skills. They “provide a big picture of the assessment problem in a short amount of time, at moderate cost, and with a good deal of technical precision and practical utility” (Merrell, 2001, p. 10).

**Strength-based assessment and response to intervention.** The shift toward a focus on positive psychology, strengths, and prevention is in conceptual alignment with the emergence of the Response to Intervention (RtI) movement in school psychology and special education. Traditional educational practices involved waiting until a student was performing low enough before services were provided (often referred to as the wait-to-fail model). That traditional model, in combination with The No Child Left Behind Act which was initiated in 2001 calling for improved student outcomes, put a great deal of pressure on teachers to boost student performance. Educators became frustrated, and it soon became clear that a more proactive and preventative approach was needed (Barnes & Harlacher, 2008).

In response, the 2004 reauthorization of the Individuals with Disabilities Education Improvement Act was initiated and stated that schools were no longer required
to utilize a discrepancy model for identifying students with specific learning disabilities. Instead, they could use an alternative method that involves first determining if the student responds to scientific research-based classroom instruction followed by targeted interventions. This approach has come to be known as RtI (Cassidy & Cassidy, 2009).

RtI is a multi-tiered method of service delivery in which students are provided with evidence-based instruction based upon their individual strengths and weaknesses. It involves frequent assessment of student progress, and data-based decision making regarding interventions and programming (Barnes & Harlacher, 2008). Although it is most often applied to the areas of reading and literacy, it incorporates a problem-solving model that can be applied to other areas of school functioning as well, including social skills and behaviors (Malecki & Demaray, 2007). The International Reading Association Commission on Response to Intervention created six principles to guide thinking about RtI and its implementation. These principles suggest that: RtI should be systematic and comprehensive, there should be collaboration among professionals, consistent assessment of student skills and progress, and optimal instruction. Additionally, the RtI process emphasizes the importance of differentiated instruction with a focus on meeting students at their zone of proximal development (Cassidy & Cassidy, 2009).

The 2004 IDEA legislation allows RtI to be used as a method for identifying students who may benefit from differentiated classroom instruction (Walker-Dalhouse et al., 2009). Even before RtI was introduced, however, special education teachers used differentiated instruction in order to meet the needs of their students with disabilities. The difference is that decades ago this often involved specialized instruction in separate facilities. Today, with the move toward an inclusive model of education and the focus of
RtI on prevention, special educators’ roles are expanding and differentiated instruction is expected to be used in all educational settings and applied to all learners (Cummings, Atkins, Allison, & Cole, 2008). So, although the idea of modifying instruction is not a new one, the RtI movement especially has helped launch current discussions and calls for differentiated instruction. This includes the acknowledgement that schools have a responsibility to adjust to the developmental needs, levels, interests, and strengths of the children they serve (Tomlinson, 2005).

Differentiated instruction stems from beliefs about learner differences and implies that schools should be maximizing the capabilities of each and every student (Anderson, 2007). It is “a set of strategies that will help teachers meet each child where they are when they enter class and move them forward as far as possible on their educational path” (Levy, 2008, p. 162). The heart of differentiated instruction is flexibility in content, creativity in instruction, student choice, ongoing assessment, and variety in how children can demonstrate learning based upon individual student styles, needs, and strengths (Anderson, 2007; Levy, 2008). Proponents of differentiated instruction argue that all students should have equal access to the general education curriculum and that their education should involve rigorous content as well as a recognition and support of differences in prior knowledge, interests, and preferred learning and thinking styles (McTighe & Brown, 2005; Sternberg & Zhang, 2005).

Differentiated instruction and the RtI movement support educators in being responsive rather than reactive to the variety of student personalities, backgrounds, needs, and strengths found in today’s classrooms (Anderson, 2007). It means that there may be shifts from content-centered to student-centered classrooms in order to eliminate a one-
size-fits-all approach to instruction. Teachers are being urged to analyze their students permanent products in order to find out their individual readiness levels, needs, interests, preferences, and strengths (Rock, Gregg, Ellis, & Gable, 2008). A consistent, research-based phenotype regarding the likely strengths of individuals with DS would help educators in their quest to differentiate instruction and utilize the natural propensities of their students in order to help them progress.

**Strength-based assessment and down syndrome.** In disabilities such as DS, the focus is often on negatives or weaknesses, and interventions are typically aimed at targeting and remediating these deficiencies. This is in line with a psychopathologizing rather than a positivistic philosophy (Rhee et al., 2001). Although assessment in schools is often used for the purpose of classification or identification of disability, this is not generally relevant in the case of DS, which is diagnosed either before or at birth through chromosome analysis (Roizen & Patterson, 2003). The ultimate goal of assessment, then, is to gain a clear and accurate picture of behaviors and skills, and to determine the interventions necessary to ensure success (Buckley, Ryser, Reid, & Epstein, 2006).

Strength-based assessment is also crucial for individuals with DS in terms of transition planning to new schools or for life after high school. As per the Individuals with Disabilities Education Act (IDEA), by age 16, a student’s IEP must contain a statement of transition services. Successful transitioning depends not only on knowledge of available community services and opportunities, but also on a solid understanding of the individual’s personal interests and strengths (National Down Syndrome Society, 2009).
Although often described primarily by deficits, behavioral phenotypes may be conceptualized as a constellation of strengths that emerge at various points and follow age-related trends. Looking at the DS behavioral phenotype and interventions from this point of view, school psychologists and other interventionists may want to target these student strengths as areas to be built upon for intrinsic value, to aid in the support of weaker areas, and for the purpose of preventing common maladaptive outcomes. Well-designed prevention and intervention strategies include increasing resources suspected to play a counteracting or protective role for children faced with various adversities, such as mental retardation and DS (Masten & Curtis, 2000).

There is emerging evidence that behavioral phenotypes exist and emerge early in the lives of individuals with DS in many areas such as language, cognition, behavior, sociability, and emotion (Fidler, 2005). The majority of studies that have been conducted to date on behavioral phenotypes in individuals with DS have used control groups and comparisons that consisted of individuals with mental retardation of mixed etiologies. Additionally, many of these studies have been conducted on babies and young children with DS and focus on deficits or maladaptive behaviors (Coe et al., 1999; Cooper & Prasher, 1998; Gath & Gumley, 1986; Turner & Sloper, 1996).

Although researchers acknowledge that the behavioral phenotype is a function of age and changes over time (Chapman & Hesketh, 2000), few studies have examined age-related changes in individuals with DS through adolescence. Even fewer have examined age-related changes in social, emotional, and behavioral strengths specifically. This is surprising given that the perceived social strengths and friendly personalities of individuals with DS have been suggested to be associated with lower rates of problem
behaviors (Dykens et al., 2002). It is also unexpected in light of the growing recognition that a focus on deficits is enhanced by simultaneously considering competencies and strengths (Rhee et al., 2001).

Competence, broadly defined, and symptoms or disorders have historically been statistically associated. Specifically, children high on internalizing symptoms have been found to experience consistent peer social problems and children high on externalizing symptoms have been found to experience weaknesses both on academic and social indicators (Achenbach, 1991). Females as a group typically have higher internalizing and lower externalizing scores (Achenbach, 1991).

The few studies that have examined age-related changes in the social, emotional, and behavioral functioning of children and adolescents with DS have found interesting results. Namely, as age increases, children with DS smile less often and for a shorter duration (Fidler et al., 2005). Externalizing problems such as low-level aggression, swearing, argumentative, and attention-seeking behaviors peak between the ages of 10 to 13, and then decline significantly by older adolescence. During the same approximate time period, internalizing behaviors increase. Individuals with DS become more withdrawn, preferring to be alone than with others and not wanting to talk to others (Dykens et al., 2002; Fidler et al.). These studies have illustrated subtle shifts in emotions and behaviors that may illuminate unique windows of opportunity for interventions designed to build upon strengths and prevent against changes that may be early harbingers of mental illness (Dykens, 2006).

Nickerson (2007) noted that strength-based assessment is more than just administering an instrument. Rather, it is a problem-solving approach advocated for all
situations in which strengths and resources are utilized for some purpose, to achieve change. Research investigating not only strengths, but the interconnections of symptoms and competencies, hold the promise of highlighting specific approaches for prevention and intervention (Masten & Curtis, 2000).

Chapter Summary

DS is one of the most prevalent neurodevelopmental disorders worldwide. It is generally diagnosed prenatally or shortly after birth and is almost always associated with some degree of mental retardation (Nadel, 2003; Roizen & Patterson, 2003). It is also accompanied by characteristic physical features as well as a large host of medical complications and vulnerabilities which can lead to behavioral difficulties as well as parent stress (Most et al., 2006; Thompson et al., 1999).

Although early studies discussed the added stressor of a child with a disability to the family system, more recent studies have noted the positive adjustment of a family unit that includes a child with DS, often referred to as the DS advantage (Hastings et al., 2002). This advantage generally continues into the educational setting in regard to parent and educators’ knowledge of these children’s strengths, weaknesses, and needs. This is due in large part to the fact that DS is well known in society and has a large research base including the oft-studied DS phenotype (Hodapp, 1996).

The DS phenotype includes characteristic patterns of strengths and weaknesses in a variety of areas. The language/communication profile generally includes strengths in receptive and pragmatic language and weaknesses in expressive language and articulation (McGuire & Chicoine, 2006). The cognitive profile includes strengths in visual processing and visuospatial memory and weaknesses in auditory and verbal processing,
and verbal memory. Knowledge of these likely profiles has led to the improvement of interventions and recommendations for prevention and remediation as well as improvements in learning (Kumin, 2003).

The SEB functioning of students with DS has been extensively researched and has historically been seen as not at all problematic. Individuals with DS are stereotypically seen as happy, sociable, and well-behaved (Blacketer-Simmonds, 1953). More recent research has suggested that, although on the surface to some degree this may be true, individuals with DS are certainly not problem-free in this area (Virji-Babul et al., 2006).

In line with the current movement in positive psychology as well as RtI, the value of strength-based assessments is becoming increasingly recognized and called upon (Nickerson, 2007). The identification and utilization of strengths can help create interventions and inform educational placement decisions for all students (Buckley & Epstein, 2004). Although stereotypically seen as having strengths in SEB functioning, there is a lack of research documenting this in individuals with DS as assessed by purely strength-based measures as well as information documenting trajectories or changing levels over time.

The purpose of this study was to investigate differences in levels of SEB strengths in students with DS with specific regard to changes in childhood and adolescence. The study utilized a standardized, norm-referenced instrument specifically designed to measure strengths and information was collected through parent ratings. Furthermore, the study examined the extent to which SEB strengths were related to gender and school placement. The goal of this study was to add to the research literature on DS behavioral
phenotypes, identify the relationship between strength levels and school placements, and investigate age-related changes in strengths.

**Research Questions**

The information gained from this study was used to answer the following research questions:

1. As perceived by their parents, what qualitative levels of strengths on the BERS-2 Strength Quotient do children and adolescents with DS possess?
2. Is there a difference between groups on the BERS-2 Strength Quotient?
3. Are there differences in the specific strength areas (subscales) for students with DS by group as reported by parents?
4. Are there gender differences in the overall level of strengths by group?
5. Are strength scores different for DS students receiving inclusion, consultant teacher, or self-contained services, by group?
CHAPTER 3
Method
Overview

The purpose of this chapter is to describe the methods that were involved in this study. It is organized into four sections, the first of which describes the participants and how they were recruited. The next is a review of the BERS-2 as well as the Parent Questionnaire (Appendix A), which was created by the primary investigator. Third is a description of how data was collected, and finally, there is an explanation of the data analysis procedures that were used to answer the research questions.

Participants

The participants in this study were parents of 5-18 year-old children with DS. Modeling previous recruitment strategies, they were sought through national and local DS organizations in upstate New York, Long Island, and Connecticut through direct solicitations at events, and through newsletters and internet postings (Rosner et al., 2004).

Instruments

Behavioral and Emotional Rating Scale – Second Edition (BERS-2). Parents of children and adolescents ages 5-18 with DS rated their child’s strengths using the BERS-2 Parent Rating Scale (PRS). The BERS-2 is a standardized measure that may be especially useful for informing interventions because it identifies and highlights social, emotional, and behavioral strengths and can be used to enhance other areas (Beaver, 2008). It can also be used to identify children at-risk for experiencing problems, to formulate goals for IEPs or treatment plans, to assess improvement or changes in strength areas, or to serve as a measure in research projects (Epstein, Rudolph, & Epstein, 2000).
As described by Epstein (2004), the BERS-2 consists of three rating scales; Teacher Rating Scale (TRS), Parent Rating Scale (PRS), and Youth Rating Scale (YRS). These three rating scales have five core subscales which include Interpersonal Strength (measures the ability to control emotions or behaviors in social situations), Family Involvement (measures participation in and relationship with family), Intrapersonal Strength (measures broadly outlook on competence and accomplishments), School Functioning (measures competence in school and classroom tasks), and Affective Strength (measures ability to accept affection from others and express feelings toward others). The PRS and YRS also contain a supplemental Career Strength subscale, which was not included due to the large age span involved in this study and the likelihood that most of the children were school-age and did not have jobs.

The sum of the subscale standard scores is converted into a Strength Index, which has a mean of 100 and standard deviation of 15. The five subscales each have a mean standard score of 10 and a standard deviation of 3. Higher scores are indicative of greater levels of strengths. The five-factor structure has been confirmed among all three rating scales and the overall Strength Index has been proven to be a valid underlying influence on the five subscales (Buckley et al., 2006).

The BERS-2 Parent Rating Scale was chosen for this research project for a variety of reasons. It is written at a fifth grade reading level and was designed to be completed quickly and easily in approximately 10 minutes by the individuals who know the child best and are therefore able to make global judgments about the youth’s behavioral characteristics (Mooney, Epstein, Ryser, & Pierce, 2005). Although it is a good idea to gain multiple sources of information when making important decisions, it has been
suggested that, as opposed to clinicians or teachers, parents interact with their children across a multitude of settings and over the course of the child’s entire life span, and therefore are likely to provide a broader view of their child’s behaviors (Hodapp & Dykens, 2005). Although direct measurement is generally the approach of choice when measuring such constructs as cognition or memory, caregiver report measures are “indispensable” for measuring adaptive and maladaptive behaviors (Hodapp & Dykens, 2005).

The BERS-2 can be used repeatedly to document changes in strengths and competencies and to demonstrate the effectiveness of interventions (Buckley & Epstein, 2004). Parents read each of the 52 statements and mark the rating that reflects the individual child most accurately. The items are rated on a 4-point Likert scale that ranges from 0 (not at all like the child) to 3 (very much like the child). The normative sample of the PRS includes individuals with disabilities. When used to assess children without disabilities, the PRS has been found to be moderately to highly correlated with other measures including the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) and the Child Behavior Checklist (CBCL; Epstein, 2004).

The normative sample for the PRS is national, and therefore, the characteristics approximate the demographic variables reported for all schoolchildren in the United States. Accordingly, conclusions can be drawn regarding whether a child’s score is typical of children nationally and how far from average an atypical score is. In addition to the index, standard, and scaled scores described previously, qualitative descriptors provided in the BERS-2 manual range from Very Poor, Poor, Below Average, Average,
Above Average, Superior, and Very Superior, and are used as a means of comparison to the normative sample (Epstein, 2004).

The normative sample for the PRS consisted of 927 parents in 34 states including those in the northeast, midwest, south, and west. In percentages similar to those found in the U.S. Population (as indicated by the 2001 Census), it included males and females, as well as a variety of family income and parent educational attainment brackets. Parents were of children ranging from age 5-18 years including those with no disability status, Attention-Deficit Disorder, Learning Disabilities, and other disabilities (Epstein, 2004).

A study evaluating reliability and validity of the BERS-2 on nondisabled students concluded sound results (Mooney et al., 2005). Test-retest reliability is an indicator of an instrument’s stability over time, and higher scores increase the confidence with which administrators of tests can generalize the findings of one administration over time (Gall et al., 2003). A study conducted by Mooney and colleagues (2005) found the BERS-2 PRS to be a stable measure with reliability coefficients ranging from a low of .80 (career subscale) to a high of .94 (family involvement subscale).

The same study also examined the convergent and discriminant validity of the BERS-2, or the degree to which it correlated positively or negatively with other similar or opposing measures. It found that the BERS-2 correlated significantly with the Social Skills Rating System (Gresham & Elliott, 1990) on both its Social Skills scale (correlation coefficients range from .45 to .74) and Problem Behaviors scale (correlation coefficients range from -.48 to -.79). It also correlated significantly in an inverse direction with all scales of the Child Behavior Checklist (CBCL; Achenbach, 1991a), which is a measure of pathology and problem behaviors. Correlation coefficients ranged
from -0.9 to -.91 and many were statistically significant. It should be noted that the sample for these studies did not include students with disabilities (Mooney et al., 2005).

Chafouleas and Bray (2004) maintained that the ultimate goal of education is mastery, not only of academic content, but also social and behavioral skills. The BERS-2 reflects this belief. Additionally, the domains of the BERS-2 are similar to some of the many domains believed to be integral to quality of life, including emotional well-being, interpersonal relations, material well-being, personal development, physical well-being, self-determination, social inclusion, and rights (Schalock et al., 2002).

**Parent questionnaire.** In addition to the BERS-2 PRS, parents were asked to complete a short researcher-created Parent Questionnaire (see Appendix A). The responses from the questionnaire were used to group respondents and answer the research questions. The questionnaire was comprised of items related to the child’s disability, gender, and educational programming. It also contained questions regarding parent gender and level of education.

**Procedure**

Representatives from various DS organizations were contacted via telephone and/or email to determine their interest in allowing the researcher to recruit participants for this study. After providing a positive response, a brief statement of intent to cooperate was requested by the researcher. Approval was sought and obtained through the Institutional Review Board (IRB) of the University at Albany, State University of New York at Albany. Organization representatives were then asked to provide mailing lists of members and/or to provide a time and date for the researcher to solicit participants or place a poster in newsletters, websites, or on organization bulletin boards (see Appendix
B). It was anticipated that local events as well as regularly scheduled meetings could be utilized, as this has been the case for past research studies (Dykens, 2002). Indeed, this was the case. The researcher was welcomed at and attended four Buddy Walks for DS awareness throughout New York and Connecticut.

Potential participants who contacted the primary investigator by email were mailed packets, which included a cover letter. The cover letter contained a description of the study as well as information regarding informed consent (see Appendix C). Also included were the BERS-2 PRS, the Parent Questionnaire, and a self-addressed, stamped envelope.

As completed packets were received by the primary investigator, the PRS and Parent Questionnaires were immediately separated from the mailing envelope and the coded number was recorded on a spreadsheet, in order for the researcher to document receipt. Reminders were sent to participants whose materials had not been returned within two weeks of being mailed. Two weeks after the first reminders were issued, a final reminder letter was sent in order to help maximize responses.

Individuals who were contacted at the Buddy Walks were handed a packet. They were given the choice to complete the packet on the spot, or bring it home, complete it, and return it to the researcher in a self-addressed and stamped envelope. These individuals were also added to the spreadsheet and follow-up letters were sent in the manner previously described.
CHAPTER 4

Results

Overview

This chapter includes a summary and description of the statistical program and analyses used to examine the data collected in the study and answer the research questions posed earlier. It initially describes methods of data screening and transformation. Next, demographic characteristics of the sample are reviewed. Finally, results of the descriptive and inferential statistics used to answer the research questions are reported.

Data Screening and Transformation

Of the 90 surveys that were mailed out to participants or handed out at events, 83 were returned for a response rate of 92 percent. Sixty two participants (75%) were obtained at Buddy Walks, and the remaining 21 (25%) were those who responded by email to internet postings, newsletters, and mass organization emails. In comparison to DS studies utilizing an experimental methodology, this sample size was quite high (Kasari & Freeman, 2001; Kasari, Freeman, & Bass, 2003; Kasari, Freeman, Mundy, & Sigman, 1995). In comparison to other DS studies utilizing a survey methodology, however, this number was more typical (Coe et al., 1999; Dykens et al., 2002; Fidler, Barrett, & Most, 2005).

All data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) Version 19.0. Surveys were screened immediately upon being returned for omitted items or items that were marked with more than one response option. Most of these were corrected on spot by the rater, if possible. Some surveys that were returned
by mail to the examiner contained omitted or multiple marked items, but none contained so many as to render it unscorable. Upon instruction by Epstein (2004), the scores for the missing or multiple marked items were estimated by computing the average of the other items in the same subscale. This occurred for a total of 20 items spread out over 12 rating scales.

Immediately following data entry, accuracy was assessed by visually scanning for any inconsistent, improbable, or impossible scores. Two such cases were found and corrected. To assess the normality of the distribution and the presence of outliers, values for skewness and kurtosis were examined for all continuous variables. One variable, School Functioning Percentile, was found to be non-normal, as well as to contain outliers. Specifically, this variable was skewed toward the lower scores with two cases falling well above the others. It was transformed accordingly using the log function, as suggested by Tabachnick and Fidell (2006), which normalized skew and kurtosis and eliminated outliers. All other variables were found to be within normal limits.

The participants were separated into two groups, children and adolescents, based upon age. Adolescence is defined as 10-19 years of age according to The Center for Disease Control (Brindis et al., 2004) and the World Health Organization (WHO, 2009). Based, in part, upon these definitions, as well as the distribution of ages in the current sample, those between the ages of 5 and 10 were placed in the “children” group, and those between the ages of 11 and 18 were placed in the “adolescent” group. Table 1 provides a summary of the number of participants by age, and illustrates how the sample was skewed toward the younger ages.
Table 1

*Frequency of Participants in Each Year of Age*

<table>
<thead>
<tr>
<th>Years of Age</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>25.3</td>
<td>21</td>
</tr>
<tr>
<td>6</td>
<td>7.2</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7.2</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>13.3</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>10.8</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>7.2</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>2.4</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>4.8</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>7.2</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>2.4</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>3.6</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>2.4</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>3.6</td>
<td>3</td>
</tr>
</tbody>
</table>
The final sample consisted of 83 individuals with Down syndrome ranging in age from 5 to 18 years ($M = 9.07; SD = 3.82$). There were 48 males ($M = 8.65; SD = 3.56$) and 35 females ($M = 9.66; SD = 4.14$). The parents completing the surveys were all biological with the exception of one case, who was an adoptive parent. The surveys were completed by 57 mothers (68.7%) and 26 fathers (31.3%) of which 27.7% had a high school education, 41% had a four year college degree, and 31.3% had a graduate or professional degree. A description of the sample including frequency of educational disability classification, educational placement type, and related services received is presented in Table 2.

**Research Question 1:** As perceived by their parents, what qualitative levels of strengths on the BERS-2 Strength Quotient do children and adolescents with DS possess?

Means and standard deviations were calculated for each age group for the Strength Index as well as for the Subscales, and are provided in Table 3. These values were then compared to the values corresponding to the qualitative descriptive categories provided in the BERS-2 manual for the normative sample (see Table 4). For both age groups, the overall Strength Index was in the *average* range as compared to the normative sample. Additionally for both age groups, the Interpersonal Strengths, Family Involvement, Intrapersonal Strengths, and Affective Strengths subscale means were all also in the *average* range as compared to the normative sample. Means for both age groups for the School Functioning subscale were in the *below average* range.

Further, a chi square test was performed to determine whether the two age groups had equal strengths overall, as well as for each subscale. No significant differences were
Table 2

*Participant Characteristics*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Children % (n)</td>
<td>Adolescent % (n)</td>
<td>Overall % (n)</td>
</tr>
<tr>
<td>Disability Classification</td>
<td></td>
<td>39 (23)</td>
<td>45.8 (11)</td>
<td>41 (34)</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td></td>
<td>35.6 (21)</td>
<td>25 (6)</td>
<td>32.5 (27)</td>
</tr>
<tr>
<td>Multiple Disabilities</td>
<td></td>
<td>3.4 (2)</td>
<td>8.3 (2)</td>
<td>4.8 (4)</td>
</tr>
<tr>
<td>Speech/Language Impairment</td>
<td></td>
<td>3.4 (2)</td>
<td>4.2 (1)</td>
<td>3.6 (3)</td>
</tr>
<tr>
<td>Learning Disability</td>
<td></td>
<td>59.3 (35)</td>
<td>33.3 (8)</td>
<td>51.8 (43)</td>
</tr>
<tr>
<td>Educational Placement</td>
<td></td>
<td>5.1 (3)</td>
<td>12.5 (3)</td>
<td>7.2 (6)</td>
</tr>
<tr>
<td>Consultant Teacher/Resource Room</td>
<td></td>
<td>35.6 (21)</td>
<td>50 (12)</td>
<td>39.8 (33)</td>
</tr>
<tr>
<td>Related Service</td>
<td></td>
<td>98.3 (58)</td>
<td>87.5 (21)</td>
<td>95.2 (79)</td>
</tr>
<tr>
<td>Speech/Language</td>
<td></td>
<td>93.2 (55)</td>
<td>66.7 (16)</td>
<td>85.5 (71)</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td></td>
<td>88.1 (52)</td>
<td>37.5 (9)</td>
<td>73.5 (61)</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td></td>
<td>11.9 (7)</td>
<td>20.8 (5)</td>
<td>14.5 (12)</td>
</tr>
<tr>
<td>Music Therapy</td>
<td></td>
<td>20.3 (12)</td>
<td>8.3 (2)</td>
<td>16.9 (14)</td>
</tr>
<tr>
<td>Other&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: <sup>a</sup> Other related services included horseback riding, applied behavior analysis, discreet trial training, vision therapy, feeding therapy, and counseling.
Table 3

*Means and Standard Deviations of BERS-2 Strength Index and Subscale Scores by Age Group*

<table>
<thead>
<tr>
<th>BERS-2 Strength Index or Subscale</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Child $M (SD)$</td>
</tr>
<tr>
<td>Strength Index</td>
<td>92.69 (13.25)</td>
</tr>
<tr>
<td>Interpersonal Strength</td>
<td>8.59 (2.40)</td>
</tr>
<tr>
<td>Family Involvement</td>
<td>10.85 (2.50)</td>
</tr>
<tr>
<td>Intrapersonal Strength</td>
<td>8.73 (2.66)</td>
</tr>
<tr>
<td>School Functioning</td>
<td>6.19 (1.69)</td>
</tr>
<tr>
<td>Affective Strength</td>
<td>10.39 (2.30)</td>
</tr>
</tbody>
</table>
Table 4

*Qualitative Descriptors Associated with BERS-2 Index and Scaled Scores*

<table>
<thead>
<tr>
<th>BERS-2 Qualitative Descriptor</th>
<th>Strength Index</th>
<th>Subscales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Superior</td>
<td>&gt;130</td>
<td>17-20</td>
</tr>
<tr>
<td>Superior</td>
<td>121-130</td>
<td>15-16</td>
</tr>
<tr>
<td>Above Average</td>
<td>111-120</td>
<td>13-14</td>
</tr>
<tr>
<td>Average</td>
<td>90-110</td>
<td>8-12</td>
</tr>
<tr>
<td>Below Average</td>
<td>80-89</td>
<td>6-7</td>
</tr>
<tr>
<td>Poor</td>
<td>70-79</td>
<td>4-5</td>
</tr>
<tr>
<td>Very Poor</td>
<td>&lt;70</td>
<td>1-3</td>
</tr>
</tbody>
</table>
observed between the groups for: Strength Index, $\chi^2 (4, N=83) = 8.11$, n.s., Family Involvement, $\chi^2 (4, N=83) = 5.95$, n.s., Intrapersonal Strength, $\chi^2 (4, N=83) = 4.05$, n.s., School Functioning, $\chi^2 (4, N=83) = 6.85$, n.s., or Affective Strength, $\chi^2 (4, N=83) = 7.46$, n.s. A significant difference between groups was found for Interpersonal Strength, $\chi^2 (4, N=83) = 15.56$, $p = .004$.

Specifically, children were most likely to have a qualitative descriptor of Average (64%), followed by Below Average (19%), and then Poor (12%); whereas adolescent’s qualitative descriptors were more equally spaced, in that adolescents were most likely Average (29%) or Above Average (29%), followed by Poor (21%) and Below Average (17%). Overall, it appears that children are most likely to be classified in the Below Average to Average range, whereas adolescents fair slightly better and are more likely to be classified in the Average to Above Average range. Table 5 presents the distribution of parent ratings, by qualitative descriptive category for overall strengths, as well as each subscale for both children and adolescents.

Research Question 2: Is there a difference between groups on the BERS-2 Strength Quotient?

Descriptive analysis was initially used to examine differences in Strength Quotients. An independent-samples $t$-test was performed in order to further analyze differences in PRS Strength Quotient scores for children with DS in both age groups. The results confirmed that there was no statistically significant difference between Strength Quotient scores for children ($M = 92.69$, $SD = 13.25$) and adolescents ($M = 95.25$, $SD = 20.76$), $t(81) = -.67$, n.s.
Table 5

*Frequency of Parent Ratings by Descriptive Categories*

<table>
<thead>
<tr>
<th>Quotient/Subscale and Descriptive Categories</th>
<th>Group</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children % (n)</td>
<td>Adolescent % (n)</td>
<td></td>
</tr>
<tr>
<td>BERS Quotient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Superior</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Superior</td>
<td>0 (0)</td>
<td>8.3 (2)</td>
<td></td>
</tr>
<tr>
<td>Above Average</td>
<td>10.2 (6)</td>
<td>20.8 (5)</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>52.5 (31)</td>
<td>33.3 (8)</td>
<td></td>
</tr>
<tr>
<td>Below Average</td>
<td>16.9 (10)</td>
<td>12.5 (3)</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>20.3 (12)</td>
<td>25 (6)</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Interpersonal Strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Superior</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Superior</td>
<td>0 (0)</td>
<td>4.2 (1)</td>
<td></td>
</tr>
<tr>
<td>Above Average</td>
<td>5.1 (3)</td>
<td>29.2 (7)</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>64.4 (38)</td>
<td>29.2 (7)</td>
<td></td>
</tr>
<tr>
<td>Below Average</td>
<td>18.6 (11)</td>
<td>16.7 (4)</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>11.9 (7)</td>
<td>20.8 (5)</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Family Involvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Superior</td>
<td>0 (0)</td>
<td>0 (0)</td>
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</table>

*table continues*
Table 5. (continued)

<table>
<thead>
<tr>
<th>Quotient/Subscale and Descriptive Categories</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children % (n)</td>
</tr>
<tr>
<td>Superior</td>
<td>5.1 (3)</td>
</tr>
<tr>
<td>Average</td>
<td>61 (36)</td>
</tr>
<tr>
<td>Below Average</td>
<td>11.9 (7)</td>
</tr>
<tr>
<td>Poor</td>
<td>1.7 (1)</td>
</tr>
<tr>
<td>Very Poor</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Intrapersonal Strength</td>
<td></td>
</tr>
<tr>
<td>Very Superior</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Superior</td>
<td>5.1 (3)</td>
</tr>
<tr>
<td>Above Average</td>
<td>5.1 (3)</td>
</tr>
<tr>
<td>Average</td>
<td>61 (36)</td>
</tr>
<tr>
<td>Below Average</td>
<td>16.9 (10)</td>
</tr>
<tr>
<td>Poor</td>
<td>11.9 (7)</td>
</tr>
<tr>
<td>Very Poor</td>
<td>0 (0)</td>
</tr>
<tr>
<td>School Functioning</td>
<td></td>
</tr>
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<td>Very Superior</td>
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</tr>
<tr>
<td>Superior</td>
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<tr>
<td>Above Average</td>
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<tr>
<td>Average</td>
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</table>

*(table continues)*
Table 5. *(continued)*

<table>
<thead>
<tr>
<th>Quotient/Subscale and Descriptive Categories</th>
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<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adolescent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% (n)</td>
<td>% (n)</td>
</tr>
<tr>
<td>Below Average</td>
<td></td>
<td>45.8 (27)</td>
<td>25 (6)</td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td>35.6 (21)</td>
<td>33.3 (8)</td>
</tr>
<tr>
<td>Very Poor</td>
<td></td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Above Average</td>
<td></td>
<td>23.7 (14)</td>
<td>25 (6)</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>67.8 (40)</td>
<td>45.8 (11)</td>
</tr>
<tr>
<td>Below Average</td>
<td></td>
<td>5.1 (3)</td>
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</tr>
<tr>
<td>Poor</td>
<td></td>
<td>3.4 (2)</td>
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</tr>
<tr>
<td>Very Poor</td>
<td></td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Research Question 3: Are there differences in the specific strength areas (subscales) for students with DS by group as reported by parents?

Descriptive analysis and a one-way Multivariate Analysis of Variance (MANOVA) were used to examine differences in PRS subscale scores for children and adolescents. The MANOVA revealed a non significant multivariate main effect for age group, $F(1, 81) = 1.61, \text{ns}$.

Research Question 4: Are there gender differences in the overall level of strengths by group?

A 2 (gender: boys, girls) x 2 (age group: children, adolescents) Analysis of Variance (ANOVA) was conducted to examine the impact of both gender and age on overall strength level. Results revealed no statistically significant main effects for age group, $F(1, 81) = .55, \text{ n.s.}$ or gender, $F(1, 81) = .00, \text{ n.s.}$ Age group had no impact on overall strength level, nor did gender. Furthermore, there was no statistically significant interaction, $F(1, 81) = .37, \text{ n.s.}$ The means and standard deviations for overall strength scores for males and females are presented in Table 6.

Research Question 5: Are strength scores different for DS students receiving inclusion, consultant teacher, or self-contained services by group?

A 2 (age group: children, adolescents) x 3 (educational placement: inclusion, consultant teacher, self-contained) Analysis of Variance (ANOVA) was used to examine the impact on educational placement type on overall strength level. Results revealed no main effect for age group, $F(1, 81) = .19, \text{ n.s.}$ There was, however, a statistically significant main effect for educational placement, $F(2, 80) = 4.02, p = .02$. Specifically, students in inclusive educational placements have significantly higher overall strength.
<table>
<thead>
<tr>
<th>Gender</th>
<th>Child $M (SD)$</th>
<th>Adolescent $M (SD)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>93.63 (12.18)</td>
<td>94.15 (23.15)</td>
</tr>
<tr>
<td>Female</td>
<td>91.33 (14.83)</td>
<td>96.55 (18.57)</td>
</tr>
</tbody>
</table>
scores than those in self-contained placements. Lastly, the age by educational placement interaction was not significant, $F(2, 80) = .75, n.s.$ Table 7 presents the means and standard deviations for overall strength score for both children and adolescents in all three of the educational placements.

Follow-up $t$-tests revealed a statistically significant difference between inclusion and self-contained placements only $t(74) = 2.81, p = .006$. Specifically, students in inclusive placements had significantly higher overall Strength scores than those in self-contained placements.
Table 7

*Means and Standard Deviations of BERS-2 Strength Index Scores, by Educational Placement*

<table>
<thead>
<tr>
<th>Educational Placement</th>
<th>Child $M$ (SD)</th>
<th>Adolescent $M$ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>96.46 (13.03)</td>
<td>104.63 (17.68)</td>
</tr>
<tr>
<td>Consultant Teacher/Resource Room</td>
<td>96.00 (1.73)</td>
<td>87.67 (32.52)</td>
</tr>
<tr>
<td>Self Contained</td>
<td>85.95 (12.06)</td>
<td>92.58 (19.63)</td>
</tr>
</tbody>
</table>
CHAPTER 5
Discussion

Overview

Overall, the goal of this study was to add to the research literature on DS behavioral phenotypes, identify the relationships between strength levels, school placements, gender, and investigate age-related DS strengths. This chapter contains a discussion of the results presented previously. The major findings are reviewed in reference to their convergence or divergence from previous literature. Implications, limitations, and suggestions for future research are also included.

The field of social work has begun to integrate strengths-based practices when working with people with developmental disabilities (Russo, 1999). Currently, however, there are no known studies in the field of school psychology that examine SEB functioning in the DS population from a strength-based perspective or as a function of age. Strength-based assessment (SBA) involves the measurement of positive emotions, behaviors, and aspects of an individual’s life (Epstein, 2004), and has been utilized most often with students with EBD (Cox, 2006, Reid, Epstein, Pastor, & Reyser, 2000). There are also studies that have involved strength-based assessment in students with Learning Disabilities (Reid, Epstein, Pastor, & Reyser, 2000), Autism Spectrum Disorders (Cosden, Kern Koegel, Koegel, Greenwell, & Klein, 2006), and at-risk youth (Farmer, Clemmer, Leung, Goforth, Thompson, Keagy, & Boucher, 2005), yet not Down syndrome.

The current study has extended the positive psychology and strength-based literature by applying measures to a different population, students with Down syndrome. Results indicate that the use of strength-based measures such as the BERS-2 is possible
with this population. Although additional data are needed to fully validate the sensitivity and specificity of the BERS-2 for DS populations, the BERS-2 PRS was shown in this study to be suitable for administration to a population of parents of children with DS. Participants were able to apply their knowledge of their children to appropriately answer questions regarding their strengths and valuable information was gained.

**Comparison of Strengths to a Normative Sample**

The comparison of parent-rated strengths of children and adolescents with Down syndrome to a normative sample of students revealed *average* overall levels of strengths for both groups. Additionally, for both groups, the Interpersonal Strengths, Family Involvement, Intrapersonal Strengths, and Affective Strengths subscale means were also in the *average* range as compared to the normative sample.

This means that, in the current study, individuals with DS were found to be largely comparable to typically developing individuals in terms of their ability to control their emotions and behaviors in social situations, accept affection from others, and express feelings toward others. Their broad outlook on their own competence and accomplishments, as well as their participation in and relationships with family members, were rated as commensurate with typically developing peers.

**Divergent findings.** Overall, this finding is somewhat surprising given the level of overall pervasive developmental delays, medical, and psychological difficulties characterized by this population (Kusters, Verstegen, Gemen, & de Vries, 2009, Nadel, 2003, Roizen & Patterson, 2003). It is also at odds with research that has found nursery school and school-age children with DS to avoid physical social interactions (Sinson & Wetherick, 1981) and spend larger portions of free time engaged in solitary activities than
social interaction activities (Virji-Babul, Hovorka, and Jobling, 2006). It diverges from research showing toddlers and young children with DS to spend more time in passive or self-absorbed activities than their typically developing peers (Inman-Linn, Goodman, & Lloyds-Lender, 2000). The finding that children with DS have a more difficult time than their typically developing peers with emotional regulation (Jahromi, Gulsrud, & Kasari, 2008) and emotion recognition (Williams et al., 2005) is also not supported by the current results.

It is possible that the divergent findings between the current results and those of the comparison studies involve collection methods and main focus. In the current study, parents were informants of behavior. In the comparison studies, data were collected largely using observation and behavior coding methods, as well as performance measures such as a variation of the Benton Facial Recognition Test (Williams et al., 2005) and an impossible puzzle task (Jahromi, Gulsrud, & Kasari, 2008). In addition, the main focus of the current study was SEB strengths generally. In the comparison studies, the foci included passive behavior, emotion recognition, emotional competence, and peer interactions, which were much more targeted and specific.

With regard to adults, the results of the current study diverge with findings that social relationships are noticeably limited in those with DS in comparison to those in the general population (Carr, 2008). They also diverge with research showing that adults with DS prefer passive or self-absorbed activities to social or community-based activities (Putnam, Pueschel, & Holman, 1988). Perhaps individuals with DS experience a change in social skills, sociability, or strengths sometime during the transition from adolescence to adulthood.
Individuals with DS experience the same adolescent difficulties as their typically developing counterparts including growth spurts, changes in sexual drives, and struggles between simultaneous desires for protection and independence (Pueschel, 1996). The challenges faced by individuals with DS, however, may be intensified during this time period as they are generally perceived by society as being younger than they are and often need assistance with hygienic skills, which can blur some boundaries of privacy (Edwards, 2001). Additionally, individuals with DS tend to learn well with concrete approaches, whereas adolescence is often a time for incidental learning in regard to social and sexual information (Edwards, 2001). Conceivably, these issues may play a role in decreasing the strength levels of individuals throughout the transition from adolescence into adulthood.

Convergent findings. As discussed previously, the literature on SEB functioning in DS is quite variable. Although the current findings diverge with some research, they are in line with others. For example, the current finding is not surprising given some research that has shown individuals with DS of various age ranges (including toddlers, young children, children, adolescents, and adults) have strong social skills (Fidler et al, 2006, & Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004). In relation to many of their characteristic weaknesses in language and cognition, children with DS generally display their greatest strengths in the areas of social skills (Hodapp, 1996). These strengths are apparent not only in relation to their own personal skills, but also in comparison to individuals with mixed etiologies, and are not only evident in childhood. For example, when compared to those with Williams and Prader-Willi syndrome, a sample of
individuals with DS including young children, children, and adolescents was found to have stronger social competence (Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004).

Overall, vast differences in the results of past studies suggest that the area of social skills does not necessarily constitute a uniform strength in the DS population. One proposed theory outlining an explanation for these results involves the level of cognition involved. Researchers have suggested that those social competencies that do not involve a strong social cognitive component are those in which individuals with DS retain strengths (Fidler, Most, Booth-LaForce, & Kelly, 2008). For example, individuals with DS have been found to retain social strengths in the areas of social orienting, social engagement, response to distress, comfort offering (Kasari, Freeman, & Bass, 2003), and play and leisure behaviors (Fidler, Hepburn, & Rogers, 2006).

On the other hand, when social behaviors become more cognitively complex, strengths are often not seen. For example, social referencing involves the ability to accurately appraise a situation and make a connection between an intended emotional message and a stimulus. Children with DS were found to be less effective at this than typically developing children (Kasari, Freeman, Mundy, & Sigman, 1995). Children with DS also performed more poorly than typical children in the ability to first recognize and then match emotions (Williams, Wishart, Pitcairn, & Willis, 2005; Wishart, Cebula, Willis, & Pitcairn, 2007). This hypothesis, in relation to the current study, suggests that the items on the BERS-2 may tap into skills and characteristics that do not contain complex cognitive components.

**School functioning subscale.** School Functioning was the one strength area where, when compared to the normative sample, the Down syndrome sample was rated
as below average. The BERS-2 School Functioning subscale measures competence in school and classroom tasks, such as paying attention, and completing school tasks in a timely manner. Questions on the School Functioning subscale include those of both a behavioral and achievement oriented nature. Given that DS is the oldest known cause of mental retardation or cognitive difficulties (Hodapp & Dykens, 1992) as well as learning disabilities in young children (Wishart, 1993), this finding is not necessarily surprising.

Students with DS may have difficulties functioning in school both behaviorally and academically for a variety of reasons. This is likely due largely to lower cognitive abilities. As discussed previously, the majority of children with Down syndrome score between 40 and 69 on tests of cognitive abilities, indicating mild to moderate levels of intellectual disability (Tocci, 2000). Additionally, certain areas important to school functioning, such as attention have been found to detrimentally affect academic attainments in school-age children with DS (Turner, Alborz, & Gayle, 2008). These students also tend to have short concentration spans and are therefore often unable to stay on task as long as their peers (Alton, 1998).

Students with DS also may have comorbid Attention Deficit/Hyperactivity Disorder (ADHD) or Autism Spectrum Disorder (ASD). In a study by Myers and Pueschel (1991), 6% of individuals with DS below the age of 20 years also had Attention Deficit Disorder (ADD) and Autism was comorbid in 1% of that population. In more recent studies, however, prevalence for both were higher. Ekstein, Glick, Weill, Kay, and Berger (2011) found 43.9% of a sample of children with DS to have comorbid ADHD, and Lowenthal, Paula, Schwartzman, Brunoni, and Tomanik Mercadante (2007) found 5.58% of a sample of individuals age 5-19 with DS to have comorbid Autism. These
conditions are likely to produce problems involving inattention, hyperactivity, impulsiveness, distractibility, sensory issues, language, communication, and social interaction (Pueschel, 2001).

Additionally, adolescents with DS have been found to have executive function deficits. Specifically, these include working memory, planning, inhibition, set shifting, and conceptual thinking skills, all of which are utilized in school activities (Lanfranchi, Jerman, Dal Pont, Alberti, & Vianello, 2010). Difficulties in language, memory, and (Lanfranchi, Jerman, & Vianello, 2009), processing speed (Silverman, 2007), all part of the DS phenotype discussed previously, are likely to have contributed to the below average school functioning subscore found in this study.

**Comparison of Strengths (Overall and Subscale) Between Children and Adolescents**

In the current study, there were no significant mean differences between children and adolescents on overall strength level, nor any of the subscales. There was a significant difference, however, on the chi square between frequencies of descriptive classifications for the subscale of Interpersonal Strength. Specifically, on average, children and adolescents’ scores on this scale fell in the *average* range. Examination of qualitative descriptors suggested that children who were not in the *average* range were most likely to be in the *poor to below average* range; in contrast, adolescents in this sample who were not in the *average* range had a relatively equal chance of being classified as in the *above average to superior* range as the *poor to below average* range.

**Divergent findings.** Research has found age-related changes in the DS phenotype in a variety of areas (Pueschel, 1996). For example, as individuals with DS age, they experience a decrease in physical activities and an increase in weight gain
(Sellinger, Hodapp, & Dykens, 2006). There is evidence from previous research that social competence is positively correlated with chronological age in individuals with DS (Fidler, 2005, Rosner et al., 2004), and that self-perception increases with age (Begley, 1999). Sellinger, Hodapp, & Dykens (2006) found that older individuals with DS participated in more social activities than younger individuals. These findings suggested that strength scores may increase with age.

Other research, however, shows that individuals with DS display age-related changes in maladaptive behavior with increasing withdrawal and depression often beginning in late childhood and adolescence (Dykens, Shah, Sagun, Beck, & King, 2002, Fidler, Barrett, & Most, 2005, Hodapp & Dykens, 2005) and decreased frequency of smiling over time (Fidler, Barrett, & Most, 2005). This would suggest that there may be age-related changes in positive behaviors as well, with strengths decreasing with age.

**Discussion of possible contributing factors.** This conflicting literature makes the creation of hypotheses difficult and highlights the necessity of this research to assist in narrowing down the phenotype. The current study findings suggest that although other behaviors may vary with age, social, emotional, and behavioral strengths may be more similar across age groups. On the other hand, the results may have been influenced by the type of informants that agreed to participate. Specifically, those parents who agreed to complete the rating scale may have been those who believed their children to be high in SEB strengths.

Consider also that these strengths may be more closely related to and influenced by the personality and environment of individuals with DS than brain or neurocognitive functioning. In other words, the lack of a clear and consistent social, emotional, and
behavioral pattern may stem from a strong interaction of the individual with his or her environment rather than more stable genetic influences.

As already explained, DS is a genetic disorder involving a chromosomal abnormality. Many of the cognitive effects of DS have been linked to abnormal functioning of specific brain structures and systems, including the prefrontal cortex and the hippocampal system for memory and learning (Roizen & Patterson, 2003). There are clear differences in the brains of individuals with DS and typically developing individuals at various ages and phases of development including physical size and degree of myelination of neurons (Nadel, 2003). In a similar vein, there are certain areas of the brain responsible for different functions that have been found to be disproportionately affected in older individuals with DS, yet not as prominent in younger ones (Nadel, 2003). This suggests that neurocognitive development may follow a more stable and predictable pathway than constructs such as emotions and social functioning, which may be more strongly influenced by outside factors including environment and human interactions.

**Comparison of Overall Strengths Between Children and Adolescents by Gender and Educational Placement.**

In the current study, there were no significant differences in overall level of strengths between males and females. There were, however, significant differences in overall strength levels between those students in different educational placements. Specifically, students in inclusive educational placements had significantly higher overall strength scores than those in self-contained placements.
**Gender.** The majority of research involving the DS population has grouped males and females together. One study compared males and females with DS on physical constructs. The researchers found females with DS to have higher levels of fat and lower levels of lean than their male counterparts. This was the same trend that was found in the typical population (Gonzalez-Aguero, Ara, Moreno, Vicente-Rodriguez, and Casajus, 2011). Very few studies have compared males and females with DS on other non-physical constructs.

An older study by Gunn and Berry (1985) found no sex differences in terms of temperament for individuals with DS. More recent studies, however, have found emerging evidence suggesting that strengths and weaknesses in the SEB phenotype may vary by gender. For example, Begley (1999) found females with DS to have more positive perceptions of themselves overall than males. Leonard, Msall, Bower, Tremont, and Leonard (2002) found females with DS to score higher than males on a measure of functional independence including communication and social skills. Severe behavioral problems have been found to be statistically significantly more common in males with DS as compared to females (Maatta, Tervo-Maatta, Taanila, Kuski, & Iivanainen, 2006). Although this research suggests that females would present with higher levels of strengths, the current study did not find any differences between males and females with DS.

**Educational placement.** In contrast to the results found for gender, differences were found for educational placement. It is widely believed that opportunities for appropriate social and behavioral growth of students with DS are increased when they are placed in mainstream educational settings (Buckley et al., 2006; Feeley & Jones, 2006).
Years ago, most individuals with DS and other disabilities were segregated educationally (Margulies, 2007). It has been found that SEB strengths play a role in educational placements of students with EBD. Specifically, children with EBD who lacked individual strengths were more likely to require more restrictive placements (Oswald, Cohen, Best, Jenson, & Lyons, 2001). Whether or not SEB strengths play a role in educational placements for children and adolescents with DS has not yet been investigated. This study suggests that a similar trend may exist for students with DS.

Learning, in part, involves being able to successfully interact with peers and teachers. As such, social skills impact, to some degree, children’s abilities to succeed in academic settings (Steely, Schwartz, Levin, & Luke, 2008). Interestingly, results of the current study suggests that although children with DS tend to have similar levels of strengths in most areas, including social strengths, as compared to their typically developing peers, they have lower levels of school functioning strengths. Clearly, and as expected, social skills are not the only skills necessary for successful school functioning, but it does appear that they may play some role in educational placement.

Although children with DS tend to have lower school functioning strengths in comparison to typically developing samples, their overall level of strengths in this study was related to the degree of restrictiveness of their educational placement. Specifically, students with DS who had stronger overall strength scores were more often placed in educational placements that were less restrictive. Students with DS with lower overall strength scores were more often placed in more restrictive educational settings. Although strengths in some areas of social, emotional, and behavioral functioning do not always
translate to strengths in school functioning, they may be, as a whole, related to educational placement.

Similarly to students with EBD, it appears that strength levels of students with DS are likely to be a factor in the type of environment in which they receive their education. An important goal of education is to prepare individuals to function successfully as adults, and more inclusive placements help prepare students with DS to function in the real world where they will have a great deal of interaction with typically developing peers (Fredericks, 2001).

As discussed previously, less restrictive educational placements have also been found to be beneficial for students with DS in terms of achievement and behavioral growth (Buckley, Bird, Sacks, & Archer, 2006). Therefore, the findings from this study suggest that increasing a student’s strengths in a variety of areas may increase his or her chances of being placed in a less restrictive and perhaps more advantageous academic setting.

**Implications**

Researchers and educators maintain that areas of strength can be utilized to build upon weaker areas (Tsao & Kindelberger, 2008). This study suggests that in DS students, SEB strengths are consistent with those of typically developing students, unlike many other areas of their functioning, and would probably be useful in this regard. These strengths may be utilized to help counter weaknesses or more unstable/inconsistent traits such as withdrawal, depression, and cognitive weaknesses.

**Implications for practice.** This study suggests that students with DS are likely to display SEB strengths that are similar to typically developing children, and may be
largely independent of age. Accordingly, school psychologists are encouraged to incorporate strength-based measures such as the BERS-2 into psychoeducational evaluations in students with DS. In addition to informing intervention efforts, this may help foster an atmosphere of positivity surrounding progress meetings or student reviews, which can often be clouded by negativity.

The results of this study also imply that interventions and support programs for school-age children with DS may be most beneficial when they focus primarily on areas of development that research indicates are consistently weaker, including language and cognition. SEB functioning, seemingly intact in school-age children with DS, may be encouraged, rewarded, and capitalized upon in order to strengthen weaker areas.

Of course, as discussed earlier, phenotypes are only likely patterns of behavior, and every child with DS is distinctive and unique. Although strengths in some areas do not necessitate strengths in other areas, there is a connection between higher overall strength scores and less restrictive educational placements. Those students whose behaviors or abilities lead them to more restrictive educational placements might be best served by intensive, targeted, social, emotional, and behavioral interventions. Increasing their SEB strengths, may, as suggested by the results of this study, enable them to be transitioned to less restrictive placements, and therefore expose them to more opportunities for success in a variety of areas.

**Implications for families and educators.** The results of this study suggest that, despite other areas where children with DS commonly exhibit deficits, SEB functioning is an area that is relatively preserved. Specifically, students with DS were found to display “average” levels of strengths in comparison to same-age typically developing
children. Accordingly, it is suggested that parents may put forth expectations for their children with DS that are similar to their typically developing siblings. Educators, likewise, may put forth expectations for their students with DS that are similar to their typically developing peers. Such expectations have been shown to have a positive effect on achievement and growth (Reese, 2005).

**Limitations**

This study has several limitations that warrant caution in the interpretation of results and point toward suggestions for future research. An obvious limitation is the small sample size, both overall, and for the two age groups. A second limitation involves methodology utilized. Specifically, the cross-sectional nature of the design means that the strength levels of a group of children and a group of adolescents were gathered and analyzed. The strengths of specific individuals, namely, were not gathered and analyzed over time.

Other limitations involve instrumentation. The BERS-2 is a broad measure of social, emotional, and behavioral strengths. Dykens (1995) suggested that in studying behavioral phenotypes, domains should first be assessed with such broad reaching instruments. Next, areas of interest should be probed with more focal psychometric instruments. Accordingly, this study only measured strengths broadly and not more narrow, detailed aspects of strengths. Furthermore, the BERS-2 applies to student’s 5-18 years old. Accordingly, this study only included individuals older than 4 and younger than 19 years of age.

Final limitations include control groups and type of reporter. This study did not include a control group of normally developing children matched for mental age.
Instead, comparison to the normative BERS-2 sample was utilized. Additionally, parent reports of strengths were utilized due to the comprehensive and in-depth nature of the parent-child relationship. As discussed previously, this may have influenced the findings. Specifically, the type of parent who chose to complete a rating scale may have done so due to the quality of his or her child’s perceived SEB strengths. Those parents who believed their children to be lower scoring in this area may have opted not to participate.

**Future Research**

Future studies might enhance the current one by obtaining a larger sample size and utilizing a longitudinal design. The addition of a typically developing control group might be useful in further clarifying how development may impact the expression of strengths in the normal population versus the DS population. In a similar vein, comparing strengths in DS students directly with other behaviorally distinctive syndromes such as Prader-Willi, or Williams syndrome, would help establish the extent to which strengths are syndrome-specific.

This study investigated strengths in students with Down syndrome between the ages of 4 and 18 years. Due to the divergence between the results of the current study and some research regarding SEB functioning in adults, future research might investigate changes in strengths over this particular time span from adolescence into adulthood. Additionally, it may be that important changes in strength levels occur in early development and throughout adulthood as well. Future studies are needed to explore how toddlers, younger children, and adults compare in terms of strengths.

It has been suggested that the level of certain social and emotional strength behaviors in students with DS may be impacted by the level of cognitive complexity
required for their performance. Future studies may utilize measures of social and emotional functioning that involve a stronger cognitive component in order to determine if this is indeed an influential factor.

The strength levels and behaviors of students with DS may be related to factors other than age, gender, and educational placement. Future studies might include the investigation of the effects of the presence of comorbid conditions such as ADHD and ASD on the strength levels of students with DS. The relationship between adaptive behavior and SEB functioning should also be examined.

Given the specific findings of this study involving overall strengths and educational placements, future research might integrate psychometric approaches with detailed observations of students with DS both in inclusive and self-contained placements. Observations, frequency counts, videotaping, and narrow-band strength measures, for example, might be useful in gaining a more detailed understanding of the specific strengths involved in the relationship with educational placement. Future research should also gather teacher and self reports of strengths. In a similar vein, other measures of strengths that are commonly used in schools and contain teacher ratings, such as the Social Skills Improvement System (SSIS) rating scales should be gathered and compared to the current results (Ogden, 2003).

Summary

Currently, there are no known studies that examine SEB functioning in the DS population from a strength-based perspective or as a function of age. Not only is SBA in line with the recent shift toward positive psychology (Dykens, 2006), but it is also mandated by the Individual with Disabilities Education Act of 2004. The purpose of this
study was to investigate strengths in students with DS, and in particular to examine differences in levels of strengths by gender and to determine whether or not SEB strengths were related to educational placements for children and adolescents with DS.

The results of this study revealed that DS students as a whole, regardless of age, were rated by their parents as demonstrating average levels of strengths in comparison to their typically developing peers, the exception being for the subscale of School Functioning. Strengths were also found to be similar across age groups. Namely, no significant differences were found in levels of strengths for the three age groups. No differences in level of strengths were found across gender. Perhaps of most significance was the finding that parent rated strength levels differed across level of restrictiveness of educational placement with students in less restrictive (inclusion) placements being rated as exhibiting a higher level of strengths than those students in more restrictive (self-contained) educational placements.

These findings are promising in spite of various limitations including study methodology, instrumentation, and sample. Future research might expand the age groups examined, use different instrumentation, gather teacher and self-reports, compare, parent, teacher, and self-reports, and examine other factors including cognitive components. The results of this study suggest that, in comparison to many other areas of significant limitation identified for individuals with DS, SEB strengths may be an area that is relatively preserved across the school-age years. Although level of strengths did not vary significantly with gender, it was related to type of educational placement. Importantly, this suggests that individuals with DS may be able to access less restrictive school environments if their strengths are consistently supported and increased.
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Appendix A

Instructions: Please complete this form with information pertaining to you and your child with Down syndrome.

1. Does your child have Down syndrome? (check one) _____Yes   _____No (If no, please do not complete the packet)

2. What is your child’s age in years? __________
   (If your child is younger than 5 or older than 18, please do not complete the packet)

3. What is your relationship to the child?
   _____ Biological Parent   _____ Foster Parent
   _____ Adoptive Parent   _____ Other (please explain) ______

4. Please check your child’s gender.   _____ Female   _____ Male

5. Please indicate your child’s current educational disability classification
   _____ Speech or Language Impairment   _____ Mental Retardation
   _____ Learning Disability   _____ Multiple Disabilities
   _____ Other (please specify) ________________________________

6. Please check the choice that best describes your child’s current educational placement
   _____ Inclusion Classroom/Mainstreamed
   _____ Consultant Teacher or Resource Room
   _____ Self-Contained Classroom

7. Please check any related services that your child currently receives
   _____ Speech/Language Therapy   _____ Physical Therapy
   _____ Occupational Therapy   _____ Music Therapy
   _____ Other (please specify) __________________________________

8. Please mark your gender.   _____ Female   _____ Male

9. Please check the choice that best describes the highest level of education that you have achieved
   _____ High School Degree or Equivalent
   _____ Four Year College Degree
   _____ Graduate or Professional Degree
Appendix B

Do you have a child between the age of 5 and 18 with Down syndrome?

If so, you are invited and encouraged to participate in a dissertation research study entitled

*Parent-Rated Strengths of Children and Adolescents with Down Syndrome*

Your participation would involve completing a rating scale on your child’s strengths, and a short questionnaire. It is anticipated that this will take you no longer than 15 minutes total.

Your participation would be greatly appreciated.

If you are interested and/or would like more information, please contact Nicole Keenan at nb614272@albany.edu
Appendix C

Cover Letter and Information for Informed Consent

Dear Parent,

My name is Nicole Keenan and I am a doctoral candidate in School Psychology at the University at Albany. I am writing to request your participation in my doctoral dissertation entitled *Parent-Rated Strengths of Children and Adolescents with Down Syndrome*. The purpose of this study is to gather information regarding parent-rated social, emotional, and behavioral strengths of children with Down syndrome both at the childhood (5-12 years) and adolescent stages (13-18 years). The information gained may guide educators in better meeting the needs of these children.

If you choose to participate in this research project, please complete Section 5 ONLY of the enclosed strength-based rating scale (BERS-2) and the Parent Questionnaire. The rating scale is designed to be finished in approximately 10 minutes, and the questionnaire should take no more than 5 minutes, for a total completion time of approximately 15 minutes. You do not have to respond to any questions that you choose not to answer. Please return your rating scale and questionnaire in the enclosed self-addressed, stamped envelope within two weeks of receipt without including your name or your child’s name on any form or in your return address.

I do not anticipate any risk in your participation. Although you may not receive direct benefit from your participation, school professionals working with students with Down syndrome may ultimately benefit from the knowledge obtained from this research.

All information obtained in this study is strictly confidential and will be viewed only by myself and my dissertation chairperson, Stacy Williams, unless disclosure is required by law. You will not indicate your child’s name or your name on the rating scale, questionnaire, or return address label. In addition, the Institutional Review Board and University or government officials responsible for monitoring this study may inspect these records. The data collected will be used in aggregate form and may be used in publications in addition to being used for the dissertation.

The completion and return of your rating scale and questionnaire will signify your informed consent to participate. If you have any questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report any concerns about the study, you may contact the University at Albany’s Office of Regulatory Research Compliance at 518-442-9050 or orrc@uamail.albany.edu. Your participation in this project is voluntary. Even after you agree to participate in the research, you may decide to leave the study at any time without penalty or loss of benefits to which you may otherwise have been entitled.

If you would like to view a copy of the final dissertation, please email the Primary Investigator, Nicole Keenan, at nb614272@albany.edu.
Sincerely,

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