THE RELATIONSHIP BETWEEN SOCIAL CAPITAL AND SCHOOL-RELATED OUTCOMES FOR YOUTH WITH DISABILITIES

by

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DISSERTATION ABSTRACT

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Title: The Relationship Between Social Capital and School-Related Outcomes for Youth With Disabilities

This study evaluates a model of social capital where support from parents, peers, teachers, and mentors (SOS) was hypothesized to mediate the link between students' abilities to mobilize support (MOS) and four school-related outcomes: academic, behavioral, emotional, and career outcome expectations. Survey data from 206 high school students with disabilities and 16 special education teachers in six school districts across three states were collected. Results from structural equation modeling, with bootstrap tests of indirect effects, indicated that SOS mediated the links between MOS and two of the four outcomes: emotional well-being and career outcome expectations. Invariance testing revealed significant differences for boys and girls. Implications for research and practice are discussed, including the need to distinguish between social capital and the process of capital formation, and the need to consider the role of students with disabilities in the process of social capital formation.

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CHAPTER I

INTRODUCTION

The consistently poor academic achievement, emotional and behavioral symptoms, and post-school outcomes of students with disabilities in education, employment, and quality of life necessitate a research emphasis on preventive approaches in the field of secondary special education and transition. Two important constructs that have received little attention in this field are social capital and mobilization of support. Social capital resources are embedded in relationships with family, school, and community members (Bourdieu, 1986; Coleman, 1990). Mobilization of support refers to one's propensity to utilize these resources. Presumably, support resources are useless if one does not use them (Tolsdorf, 1976; Vaux, Burda, & Stewart, 1986). This study uses structural equation modeling (SEM; Kline, 2011) to test the direct and indirect relationships between social capital and its mobilization on four school-related outcomes among high school students with disabilities: academic, emotional, behavioral, and career outcome expectations (career).

Statement of the Problem

Students with disabilities comprise 9% of the school-age population (ages 6 to 21) in the United States (US); 37% of these students are between the ages of 14 and 21 (Swanson, 2008). High school graduation represents a critical milestone for all students, but particularly for students with disabilities, who face a variety of internal and external risk factors, including experiencing more stigma, bullying, and rejection than those without disabilities – all of which affect their academic, behavioral, emotional, and career-related outcomes (Murray, 2003; Rose, Espelage, & Monda-Amaya, 2009).

Students with disabilities are more likely than those without disabilities to drop out of school, earn lower wages, experience unemployment, be involved with the criminal justice system and have lower self-reported life satisfaction (Blackorby & Wagner, 1996; Newman, Wagner, Cameto, & Knokey, 2009). According to the National Center for Education Statistics (NCES; 2011), 92% of 14-year-olds and 95% of 15-year-olds served under the Individuals with Disabilities Education Act (IDEA) dropped out of school during 2007 and 2008 (M = 24.52% drop out rate for students with disabilities ages 14 to 21). Those who did graduate experienced higher rates of unemployment and underemployment than students without disabilities. If employed, they worked in secondary labor market positions with few employment benefits (Newman et al., 2009).

Rationale for This Study

Students' perception of support from family members, teachers, peers, and adult role models has been identified as a strong protective factor for a range of emotional, behavioral, and school-related outcomes (Barber & Olsen, 2004; Currie et al., 2004) including self-esteem, depression, social anxiety (De Wit, Karioja, Rye & Shain, 2011), school attendance (De Wit, Karioja, & Rye, 2010), and school connectedness (Whitlock, 2006). The field of developmental science has shown that support from individuals within an adolescent's social ecology is a strong predictor of positive socio-emotional and behavioral development (Eccles & Roeser, 2009; Lerner, Phelps, Forman, & Bowers, 2009; Montague, Cavendish, Enders, & Dietz, 2010). Longitudinal evidence also suggests that students received diminishing levels of social support as they advanced through middle (Barber & Olsen, 2004) and high school (De Wit et al., 2010, 2011). Research has also shown evidence of increasing social isolation, depressive symptoms,

and risk factors for school dropouts, and decreasing perception of scholastic competence and self-esteem as adolescents advanced to higher grades (Cantin & Boivin, 2004).

A cross-national longitudinal survey from 35 countries in Europe and North America examining the physical, emotional, and psychological health of youth ages 11, 13, and 15 found that their perception of social support correlated strongly with a range of health-related behaviors (Currie et al., 2004). Of the 35 countries surveyed, the US had the highest percentage of one-parent households (20%) and the lowest percentage of two-parent households (60%). Youth's perceived ease of communicating with parents decreased with age across all countries, but the perceived ease of American youth to communicate with parents on a regular basis consistently ranked in the lowest quartile (Morgan et al., 2004). In particular, girls reported having more difficulty communicating with fathers than boys.

Despite a large body of research revealing the importance of social capital on academic, behavioral, emotional, and career outcomes for students *without* disabilities, the impact of social capital on school-related outcomes for students *with* disabilities has not been adequately examined (Trainor, 2008). Numerous studies have assessed correlations between social capital and school-related outcomes. A fraction of these studies examined students' role in acquiring social capital. An even smaller fraction of these studies investigated how social capital contributed to the success of students with disabilities. This study uses social capital theory (Bourdieu, 1986) as a conceptual heuristic to examine direct and indirect relationships between mobilization of support (agency), social support (structure), and academic, behavioral, emotional, and career outcomes.

Contribution to Research and Practice

The distinction between *structure* and *agency* is valuable for future intervention studies because it addresses the question of whether high achieving students with disabilities actively mobilize support to meet their needs, or if their success is facilitated by existing structures at home, in school, and in communities (Gonzales, 2010). A substantial body of research has provided empirical support for the association between adolescents' social capital and school-related outcomes, but few studies have examined the mechanisms through which social capital exerts its influence on school-related outcomes. Mediators transmit effects of an independent variable (IV) to a dependent variable (DV; MacKinnon, 2008). A major reason to assess the mediation process is that results may suggest that certain variables should be strengthened or that their measurements should be improved (MacKinnon, 2008). Understanding these mechanisms can inform research and lead to the development of effective interventions. To date, no study has attempted to establish these links for students with disabilities. Additionally, policy makers have supported a public discourse on school reform that prioritizes discipline and standardized test scores over the value of relationship building. This study offers a conceptual framework to examine student success – one that focuses on relationship building.

Definitions of Key Concepts

Social capital. Social capital has a long history in the field of sociology. Its theoretical development is credited to the French sociologist Pierre Bourdieu and the American sociologist James Coleman in the late 1980s (Portes, 1998, 2000). Since then, it has become one of sociology's most popular exports to the field of education (Dika &

Singh, 2002; Portes, 2000). In education, social capital theory is frequently used to examine differential academic achievements based on class, sex, race/ethnicity, immigration status, and family structure (one vs. two-parent households; Lareau & Horvat, 1999; Hao & Bonstead-Bruns, 1998; Lopez, 1996; Pong, 1998).

As is true of many global constructs, researchers have operationally defined and measured social capital in various ways (Dika & Singh, 2002). For example, Coleman (1988, 1990) defines social capital as a function of resources in which individuals can use to trade with others. He identifies three components of social capital: (a) norms and sanctions (e.g., what a community considers to be appropriate conduct), (b) information networks (e.g., communication systems between schools and parents), and (c) trust. Putnam (2000, 2005) also operationalizes social capital in terms of norms, networks, and trust, but he measures social capital by assessing civic participation, social solidarity, and organizational membership. Feminist theorists (Adkins, 2005) have also attempted to define social capital as both a social "good" (e.g., reciprocity, trust, and cooperation) and a social "bad" (e.g., power, inequality, dependency, and vulnerability). The clarification of elements comprising social capital in the educational context is critical and necessary to select appropriate measures for this study. To achieve this end, I will discuss two leading theories of social capital, popular critiques of these theories, and why I chose one over the other.

Bourdieu's structural view of social capital. Bourdieu (1986) is primarily concerned with the reproduction of class inequality, so he uses social capital theory to explain how class structures and social relations are reproduced from one generation to the next. He defines social capital as "the aggregate of the actual or potential resources

which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 248). According to Bourdieu, social capital has the following elements: (a) it is cumulative, (b) it includes both actual and potential resources, (c) it is made up of a network of connections, and (d) this network of connections is a product of investment strategies. Bourdieu (1986) argues that these investment strategies have a multiplier effect – capital begets capital. The volume of one's social capital depends on both the size of the network and one's ability to mobilize or collect from those contingent relationships. Capital can have both a "positive value (a gain in time, a head start) or a negative value (wasted time, and doubly so because more time must be spent correcting its effects)" (Bourdieu, 1986, p. 244).

Coleman's functional view of social capital. Whereas Bourdieu defines social capital in terms of systems of reproduction and access to institutional resources, Coleman (1988, 1990) defines it in terms of norms, expectations, and trusts generated by social structures. Coleman was influenced by two intellectual streams: (a) the sociological claim that human actions are governed by norms, rules, and expectations, and (b) the neoclassical economic belief that human behaviors are driven by an independent, purposive choice to maximize one's self-interests. Coleman used social capital as a conceptual model to unite components from both theoretical orientations to explain social behavior. He contends that "social capital is defined by its function" (1988, p. S98), and that all forms of social capital must possess two elements: social structures and actions made possible within those structures (1988, 1990).

Critiques of existing definitions of social capital. Coleman's framework is the most frequently cited in the educational literature, and also the most criticized (Dika &

Singh, 2002). Researchers have found Coleman's definition of social capital difficult to measure because the outcome is placed within the definition (e.g., Edwards & Foley, 1997; Matous & Ozawa, 2010). Coleman defines social capital by its function, so the difference between the cause and the effect is difficult to distinguish. For instance, Dika and Singh (2002) argue that Coleman's definition is circular in its reasoning because sources of social capital (relationships, networks) are confused with benefits derived from it (opportunities, resources). Finally, Coleman's framework fails to differentiate between effects of social capital that is due to an individual's lack of ability to acquire support (agency) and effects that is due to institutional discrimination against that individual (structure). In contrast, the general consensus in the social capital literature is that Bourdieu's framework distinguishes the two mechanisms of activating social capital: individual agency and institutional structure (Dika & Singh, 2002). Bourdieu's theory also holds the most theoretical promise (Portes, 1998, 2000).

Coleman also assigns parents the primary role in acquiring social capital for youth. This perspective is myopic because it overlooks the youth's agency in accessing and acquiring social resources independently (Dika & Singh, 2002). In contrast, Bourdieu (1986) explicitly recognizes that the quantity and quality of one's social capital depends on an individual's ability to mobilize and convert social resources into something meaningful. He considers youth, not families, as the main agents of their social support networks. Bourdieu also withholds the assumption that social capital is entirely positive; he acknowledges the potentially negative values of social capital. Influenced by Bourdieu's theory, I distinguish between social capital and the process of capital formation. Thus, social capital is operationalized by measures of social support (SOS)

that include factors of trust, communication, and alienation. The process of social capital formation is operationalized by measures of mobilization of support (MOS).

Mobilization of support. Both Coleman and Bourdieu emphasize the importance of social networks as resources that endow an advantage to those who possess them. Only Bourdieu recognizes the possibility that potential social capital can be stored, and stored capital can be converted into actual capital through the mobilization of resources. As Briggs (1998) suggests, social capital is "what we draw on when we get others, whether acquaintances, friends, or kin, to help us solve problems, seize opportunities, and accomplish other aims that matter to us" (p. 178). For this study, I operationally define MOS using three indicators: network orientation, self-efficacy for enlisting social support, and help-seeking behaviors.

Network orientation. Network orientation refers to one's propensity to seek or accept help from others (Boissevain, 1974; Tolsdorf, 1976). Tolsdorf (1976) defines it as one's "beliefs, attitudes, and expectations concerning the potential usefulness of his [*sic*] network members in helping him [*sic*] cope with a life problem" (p. 413). An individual can have a "positive" or a "negative" network orientation. Positive orientation reflects one's beliefs or expectation that it is safe, advisable, and necessary to seek support in stressful situations. Negative orientation reflects one's beliefs or expectations that it is "inadvisable, impossible, useless, or potentially dangerous to draw on network resources" (Tolsdorf, 1976, p. 413).

Self-efficacy for enlisting social support. Bandura (1995) defines self-efficacy as "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p. 2). One's expectations of personal efficacy affect the

level of effort exerted on a given task and how long this effort will be sustained in the face of obstacles. When an individual believes that his or her actions can produce desired outcomes, he or she is highly motivated to act or to persevere in the face of difficulties (Bandura, 1986, 1995). The importance of self-efficacy has been demonstrated on numerous positive outcomes, such as career choice (Lent, Brown, & Larkin, 1987), achievement in writing and mathematics (Pajares, 2003, 2005), and life satisfaction (Bandura, Caprara, Barbaranelli, Regalia, & Scabini, 2011).

Help-seeking behaviors. The previous two indicators assess one's attitudes and beliefs toward seeking help, but fail to directly assess specific help-seeking behaviors. In response to a committee member's suggestion, a measure of help-seeking behavior was created for this study to assess students' demonstration of help-seeking behaviors towards parents, friends, and teachers.

In summary, this study tests a model of social capital, whereby MOS and SOS are hypothesized to have direct relations on academic, emotional, behavioral, and career outcomes for high school students with disabilities. Additionally, SOS is hypothesized to mediate the link between MOS and outcomes. The next chapter presents a synthesis and critique of the literature on social capital in educational research.

CHAPTER II

LITERATURE REVIEW

Dika and Singh (2002) reviewed 35 studies that examined social capital as an explanatory variable in educational research between 1986 (when Bourdieu proposed his theory) and 2001. Consequently, my literature review focuses on the period between 2001 and 2012. I used research synthesis procedures recommended by Cooper (2010) and followed a two-step process to identify the corpus of studies included in this review.

First, I located all potentially relevant research articles using a combination of subject indexes and citation searches. Electronic databases – including Sociological Abstracts and PsychInfo – were searched using the following keywords: social capital and education. This initial search yielded 406 peer-reviewed journal articles, book chapters, and dissertations, many of which were duplicates. Titles and abstracts of these documents were screened to confirm that they examined social capital in educational context. Next, I examined lists of citations from relevant studies to identify those that were missed from the subject index search.

Next, I applied the following criteria to identify the most relevant studies: (a) social capital was the primary explanatory variable, (b) outcomes of interest were school-related, including educational achievement (e.g., grades, test scores), educational attainment (e.g., graduation, college enrollment), and psychosocial factors that affect educational development (e.g., engagement, motivation), (c) primary subjects were students (rather than teachers or parents), (d) participants included students in secondary grades, and (e) research was conducted in the US. Before I present my findings, a summary of Dika and Singh's (2002) synthesis is warranted.

Social Capital in Educational Research, 1986 – 2001

Research designs. Dika and Singh (2002) reviewed 35 studies: one was a mixed methods (Stanton-Salazar & Dornbusch, 1995), six were qualitative (e.g., Fritch, 1999a; Lareau & Horvat, 1999), and 28 were survey designs. Of the 28 survey designs, 26 employed secondary analyses of large-scale national surveys not originally created to measure social capital. For example, 17 studies used data from the National Educational Longitudinal Study of 1988 (NELS:88; e.g., McNeal, 1999; Muller, 2001) and three studies used the High School and Beyond data (HSB; e.g., Smith, Beaulieu, & Israel, 1992). Sample sizes ranged from 463 to 21,924 for large-scale survey studies and 75 to 95 for qualitative studies. Four of the quantitative studies used multilevel modeling to analyze the data, the rest employed ordinary least square (OLS) or logistic regression. Six studies compared differences in social capital between groups based on race/ethnicity (Hofferth, Boisjoly, & Duncan, 1998; Kalmijn & Kraaykamp, 1996; Lopez, 1996; Sun, 1998), one-parent and two-parent families (Pong, 1998), and immigrant and native population (Hao & Bonstead-Bruns, 1998).

Indicators of social capital. Twenty-three of the 35 studies used Coleman's definition, so the majority of indicators of social capital during this period were family-oriented, including family structure, parent-child discussion, mobility, parent-school involvement, parental expectations, parental education, and intergenerational closure (the extent to which parents know their children's friends and the parents of those friends). Studies that examined sources of social capital at school used the following indicators: teachers' and counselors' expectations of students (Lopez, 1996), students' perception of caring teachers (Muller, 2001), students' involvement in extracurricular activities (Fritch,

1999a, 1999b; Israel, Beaulieu, & Hartless, 2001; Pribesh & Downey, 1999; Sun, 1999), the number of close friends attending the same school (Morgan & Sorensen, 1999), peer group values and influence (Muller & Ellison, 2001; Pribesh & Downey, 1999), school climate, and teacher-student ratio (Parcel & Dufur, 2001).

Outcomes. Dika and Singh (2002) observed three categories of outcomes in the literature: (a) educational achievement (GPA, standardized test scores, gain scores); (b) educational attainment (dropout, high school completion, number of credits); and (c) psychosocial factors related to educational development (engagement and motivation as measured by truancy and class-cutting, and commitment to school as measured by study time and student ratings of the importance of school). These studies found that social capital was positively linked to educational achievement (e.g., Pong, 1998; Sun, 1998, 1999), educational attainment (e.g., Carbonaro, 1998; White & Glick, 2000), and education-related psychosocial factors (e.g., McNeal, 1999; Muller & Ellison, 2001).

Gaps in the literature. Dika and Singh (2002) identified six gaps. First, Coleman's conceptualization of social capital is problematic because: (a) it is too vague to support a causal model, (b) it assumes that parents are the primary agents of social capital, and (c) it ignores adolescents' role in accessing social capital. Second, measures of social capital were mostly crude quantitative indicators (e.g., number of parents, number of times moved), which revealed few details about the quality of relationships between students and those in their social network and the resources those individuals provide. Third, although nearly all studies found that social capital had a positive relationship with educational outcomes, one study found a negative relationship among educational aspirations (outcome), family size, and nontraditional family structure (Qian

& Blair, 1999). Another study found inverse relationships among achievement (outcome), parent-school involvement, and parent monitoring (McNeal, 1999). Fourth, one study treated social capital as the outcome (Stanton-Salazar & Dornbush, 1995), which raised questions about the directionality of the relationship between social capital and educational outcomes. Fifth, the conceptualization of social capital was restricted by variables available in large-scale surveys, which were not originally designed to measure social capital. Sixth, validity evidence of measures of social capital was lacking in "a good portion of the research reviewed" (Dika & Singh, 2002, p. 45).

The remainder of this chapter presents my critical analysis of the contemporary literature of social capital in educational research from 2001 to 2012. First, I present a brief overview of major trends in social capital research in education during this period. Next, I thematically group the reviewed studies into those that provide empirical evidence for the links between *family* (parents and siblings), *school* (school, teachers, and classmates), and *others* (friends, neighborhood, and role models) on educational outcomes. I organize the studies in this manner to highlight patterns in findings. Subsequently, I discuss relevant studies in the special education literature. Although social capital is not a popular concept in the field of special education (Trainor, 2010), various studies have examined impacts of student support (see Test et al., 2009), parental involvement (Fourqurean, Meisgeier, Swank, & Williams, 1991), and peer assistance (see Winokur, Cobb, & Dugan, 2007) on school-related outcomes for students with disabilities. These studies did not use social capital as a guiding framework, so I present them in a standalone section to ensure that my literature review is comprehensive and relevant to those in the field of special education. I conclude the review with a critique of

the existing literature and the gaps to be filled. Lastly, I present my research questions and hypotheses.

Social Capital in Educational Research, 2001 – 2012

Social capital research in education has not changed significantly since 1986. Many studies still focus on family-based social capital in the tradition of Coleman (e.g., Kao & Rutherford, 2007; Valadez, 2002). The use of crude measures of social capital, such as counts of intergenerational closure (Kao & Rutherford, 2007) and parental involvement in parent-teacher association (Valadez, 2002) is still popular. Researchers continue to use items from extant national, large-scale, longitudinal surveys to create indicators of social capital. These include the NELS:88 (e.g., Kao & Rutherford, 2007; Ream & Palardy, 2008; Sandefur, Meier, & Campbell, 2006), ECLS-K (e.g., Freeman & Condron, 2011), Educational Longitudinal Study:2002/04 (e.g., Madyun & Lee, 2010; Wells, Seifert, Padgett, Park, & Umbach, 2011), and National Longitudinal Study of Adolescent Health (Mangino, 2010). Sample sizes for these studies ranged from 944 to 17,899. OLS regression is still the most often-used method of analysis, followed by SEM (Garcia-Reid, 2007; Woolley, Kol, & Bowen, 2008), then hierarchical linear model (HLM; Pil & Leana, 2009). Most studies used social capital as an explanatory variable, but a few treated it as an outcome variable (e.g., Greenhow & Burton, 2011; Madyun & Lee, 2010). One study examines social capital as a mediator of the relationship between social class and gain scores in mathematics (Freeman & Condron, 2011).

More qualitative studies emerged between 2001 and 2012 that collected inputs from students compared to one of six qualitative studies that did so between 1986 and 2001. For instance, Drewry, Burge, and Driscoll (2010) interviewed five students in

general education who dropped out of high school. Prado (2008) interviewed three students from immigrant and low-income families. Gonzales (2010) collected in-depth life histories of 78 undocumented Latino youths. Greenhow and Burton (2011) conducted semi-structured interviews with 11 students who used Facebook.

A new trend in evaluating multiple sources of social capital, such as parents, teachers, friends, and neighborhoods, also emerged (e.g., Garcia-Reid, 2007; Garcia-Reid, Reid, & Peterson, 2005; Woolley, Kol, & Bowen, 2008). These studies examined the quality of students' relationships with family, peers, school, and neighborhood and their impact on school outcomes. The use of social support measures as indicators of social capital reflects the declining focus on parent-oriented measures and crude indicators of social capital.

The outcome variables during this period were similar to those in the earlier period. Educational achievement measures included GPA and combined standardized mathematics and reading scores (Kao & Rutherford, 2007). Outcome measures of educational attainment included school dropout and college attendance rates (Gonzales, 2010). School engagement was the most popular psychosocial outcome (Garcia-Reid, 2007), followed respectively by school satisfaction and classroom behavior (Woolley, Kol, & Bowen, 2008). The next sections review the theoretical and empirical evidence of relationships between various sources of social capital and educational outcomes. Studies are grouped into three categories: family (parents and siblings), school (teachers and peers), and others (friends, neighbors, and mentors).

Family sources of social capital.

Parental support. The quality of parent-child relationship is a widely cited protective factor, even in cases of significant adversities (Brookmeyer, Henrich, & Schwab-Stone, 2005). Developmental theorists have long established the link between the family environment and adolescents' perceptions of the social world, which in turn, yield important behavioral consequences (e.g., Cicchetti, Ackerman, & Izard, 1995).

Existing indicators of parental social capital can be categorized as follows: parent-parent relation, parent-child relation, parent-peer relation, and parent-school relation. Many of the relationships between family social capital and students' school outcomes are significant in the positive direction. Kao and Rutherford (2007) assessed effects of intergenerational closure and parent school involvement on GPA and combined scores on standardized mathematics and reading for minority and immigrant students. Using items from NELS:88, the researchers assessed intergenerational closure with questions asking parents to name their children's five closest friends and if they knew those children's parents. Parent involvement was measured by four parent-report items about school involvement. Their findings revealed that effects of these two indicators were greatest when students were in grade 8 and less obvious by grade 12 (Kao & Rutherford, 2007). The authors also found a differential return from social capital by race (black and white) and immigrant status (first, second, or third generation). In another study, Martinez et al. (2004) found that when parents encouraged youth to succeed academically, homework frequency increased, which in turn affected students' academic performance.

Sibling support. Few studies have investigated protective aspects of sibling relationships as they have done for parent-child relationships (Gass, Jenkins, & Dunn,

2007). Drewry et al. (2010) interviewed five students who dropped out of high school and found that siblings of three of the five subjects had dropped out as well. Azmitia, Cooper, and Brown (2009) interviewed 31 Latino youth in elementary and junior high schools to investigate the correlation between support from parents, siblings, friends, and teachers and adolescents' grades in mathematics. The researchers measured emotional support by asking youth how often they had supportive conversations about personal and academic topics and received help with homework from family, friends, and teachers. They assessed educational guidance by asking youth if they have had conversations with someone about their future academic and career plans. Students reported that parents and siblings were most supportive, followed by friends, then teachers. The researchers found that only parental and sibling support and family income had significant relationships with mathematics performance.

School sources of social capital.

Teacher support. Research consistently finds teacher-student relationships to be one of the most important school factors influencing academic success (Croninger & Lee, 2001; Pil & Leana, 2009; Woolley & Bowen, 2007). In one of the first studies to consider teacher support as a form of social capital, Croninger and Lee (2001) used data from 11,000 students in grades 10 and 12 (NELS:88) to examine effects of teacher support in reducing the likelihood of dropping out. Croninger and Lee (2001) defined social capital as "the quality of social networks that comprise a student's interactions with teachers" (p. 554). The researchers used two measures of social capital: teacher-student relationship and teacher-student conversation outside of the classroom. Teacher-student relationship was comprised of six items asking students to rate how much their teachers supported

their effort to succeed in school. Teacher-student talk outside of the classroom was assessed by one dichotomous item asking teachers whether each student talked to them about schoolwork, academic decisions, or personal matters outside of class. Using logistic regression and controlling for students' sex, standardized reading and mathematics scores and attendance in grade 8, and academic behavior in grades 8 and 10, Croninger and Lee (2001) found that teacher support reduced the probability of dropping out by 50%. They also found that youth who were academically at-risk (held back between grade 2 and 8, parents notified about school-related problems more than once in the same grading period, no expectation of education beyond high school, received more than one office referrals during the first semester of grade 8) benefited more from the teacher-student talk variable. Those not academically at-risk benefited more from teacher-student relationship.

In another study, Pil and Leana (2009) used HLM to investigate the effects of teachers' human and social capital on students' standardized test scores in mathematics from grades 3 to 5. After controlling for students' socioeconomic status (SES), special education status, attendance, grade level, and the prior year's test scores, Pil and Leana (2009) found that teachers' human capital (years of teaching, formal education, and self-report ability to teach mathematics) and social capital (number and frequency of interactions with other teachers and their immediate supervisors) had significant positive effects on students' mathematics scores. Low SES and special education status were negatively related to student achievement. Azmitia et al. (2009) found that teachers were an underutilized source of support among Latino youth. However, the researchers also found that teacher support was negatively correlated with students' grades in

mathematics. They hypothesized that this negative correlation was due to the possibility that teachers provided more support to struggling students than those who already performed well in mathematics (Azmitia et al., 2009).

Peer support. Peer groups represent an important aspect of social capital in educational context (Goza & Ryabov, 2009; Tierney & Venegas, 2006; Wells et al., 2011). Many studies have addressed the relationship between peers and a range of negative and positive behaviors related to school achievement. For example, Fuligni, Eccles, Barber, and Clements (2001) assessed the long-term consequences of early adolescents' orientation towards peers on their adjustment during high school with 1,253 students in grades 7, 10, and 12. They found that regardless of race/ethnicity, involvement with deviant peer groups was associated with greater problem behaviors and lower academic achievement. Eisele, Zand, and Thomson (2009) found that students' perception of peer acceptance was associated with prosocial behaviors, which were related to school bonding, which in turn, was related to academic performance (self-report grades) among 174 middle class African-American youth. Goza and Ryabov (2009) used multilevel models to analyze a nationally representative longitudinal sample (N = 13,738, female = 51%) and found that peer networks had a significant relationship with academic achievement (GPA) and academic attainment (odds of high school graduation). In a qualitative study of homeless families, Miller (2011) found that homeless students' behavioral problems were a byproduct of lacking friends who provided peer-enforced sanctions or models for appropriate behaviors. Miller (2011) argued that homeless students with no friendships or peer relationships displayed signs of

distrust and insecurity towards individuals in their social ecology, which in turn, reduces their social capital networks.

Tierney and Venegas (2006) proposed that peers have the potential to form a "fictive kin" network – "a tightly bonded group of individuals who have come together for a specific purpose" (p. 1691). Members of this fictive kin network are not necessarily friends or even a loose affiliation of students who are planning a school dance. Instead, they are a group that works together in a sustained effort towards a goal that would not have been possible to attain without their collective strength. Tierney and Venegas (2006) analyzed results from ten focus groups, observations, and interviews in six low-income urban high schools with 75 peer counselors who were college-bound seniors trained to provide other students information about college application, scholarship, and financial aid. They found that these 75 students benefited from the socio-emotional and informational support from the fellowship with other peer counselors, access to a physical space, and mentoring from an adult college counselor. The researchers argued that effects of these 75 peer counselors on the general student population were negligible compared to benefits that these peer counselors gain in return. By serving in this role, these peer counselors developed the social capital necessary to navigate the college admission and financial aid processes, and this effect was substantial (Tierney & Venegas, 2006).

School bonding. School bonding is a multidimensional construct that encompasses school connectedness, engagement, and attachment (Cernkovich & Giordano, 1992; Hirschi, 1969; Maddox & Prinz, 2003). In the resiliency literature, school bonding is considered a developmental asset with strong associations with

adolescent health, social adjustment, and educational outcomes (Bryan et al. 2012). Catalano, Haggerty, Oesterle, Fleming, and Hawkins (2004) found that school bonding correlated with reduced problem behaviors and increased connectedness to positive adults, which in turn, predicted positive school-related outcomes Factors that influence a student's bond to a school include attachment to school, attachment to teachers and school personnel, and school involvement (Bryan et al., 2012; Cernkovich & Giordano, 1992; Hirschi, 1969; Maddox & Prinz, 2003; Murray & Greenberg, 2000, 2001).

Eccles and Roeser (2005) found that the transition to higher grade levels was marked by lower levels of bonding to school, which in turn, affected students' academic achievement. Boxer, Goldstein, DeLorenzo, Savoy, and Mercado (2011) surveyed 761 middle school students in one diverse public school in a mixed urban/suburban district in the northeastern US and found school bonding positively related to academic aspirations and expectations and negatively related to behavioral and emotional difficulties. Woolley and Bowen (2007) found that sex moderated effects of school bonding, where girls in middle and high school reported greater degrees of school bonding than boys.

Other sources of social capital.

Friend support. Unlike peer relationships, friendships are marked by closer personal attachment and greater degrees of trust and communication. Friendship takes on greater importance during adolescence, aligning with parental influence on both positive and negative outcomes (Goldstein, Davis-Keen, & Eccles, 2005). Friends become special confidantes as youth try to make sense of their changing biological, cognitive, and social ecology (Bukowski, Hoza, & Boiwin, 1994). Azmitia et al. (2009) found that friends served a specialized role relative to parents and siblings, as youth reported that friends

were key sources of emotional support and educational guidance. I found no study that examined the differential effect between friends (as close confidantes) and peers (as acquaintances) in the social capital literature. For a year, Barry and Wentzel (2006) followed 208 students in grades 9 and 10 who had at least one reciprocated friendship and found that friends' behaviors were related to students' prosocial goal pursuit, which in turn, influenced students' prosocial behaviors.

Neighborhood support. Educational researchers have examined the influence of students' neighborhoods as a corollary by virtue of using measures that included a few items on neighborhood support. For example, Garcia-Reid, Reid, and Peterson (2005) tested a path model linking school engagement with social support from parents, teachers, friends, and neighbors and neighborhood safety and school safety. The researchers surveyed 226 Latino youth from an urban middle school in a northeastern state. They found that neighborhood safety and neighborhood youth behaviors influenced students' school engagement indirectly through their influences on social support variables.

Although neighborhood support has received little attention in education research, a substantial body of research in the field of political science has examined the impact of community social capital using indicators of civic engagement and political participation (Putnam, 1995, 2000). In order to provide a comprehensive review of the literature on community social capital, a brief review of the work in political science is warranted. Putnam (1995, 2000) found that civic engagement fostered norms of reciprocity (the social expectation that people will respond to each other in kind), which in turn, provided the necessary preconditions to establish social bonds and trust. Research in political science shows that community social capital is essential to individual outcomes,

community welfare, and democratic vigor (Putnam, 1995, 2000; Schwadel & Stout, 2012). However, community social capital in the US has been declining since 1972 (Schwadel & Stout, 2012).

Mentor support. A mentor is an adult outside of immediate family or school settings "willing to help ease the transition to adulthood by providing support and challenging students [*sic*] to make good decisions" (Drewry et al., 2010, p. 513). The influence of adults outside of the family on school outcomes is rarely examined in the social capital literature, even though the number of one-parent families has increased in recent decades (Currie et al., 2004). In a qualitative study, Drewry et al. (2010) found that only one of their five subjects who dropped out of school reported having someone outside of their family or school who encouraged them to stay in school. The sole participant who reported having mentors identified his youth pastor and his uncle, both of whom tried to persuade him to stay in school. Three subjects mentioned immediate family members as their mentors; one subject mentioned that she looked up to her parents but they were "never there" (p. 514).

Social Capital in the Special Education Literature

In a systematic review of correlational studies in the secondary special education and transition literature, Test et al. (2009) found 16 evidence-based, in-school predictors of positive post-school outcomes in education, employment, and independent living for students with disabilities. Five of those predictors are related to social capital: parental involvement, student support, social skills, community experiences, and self-determination.

Parental involvement. Test and Cease-Cook (2012) define parental involvement as participation in the IEP and educational processes when students are between the ages of 14 and 21. Test et al. (2009) found one a priori study in the special education literature (Fourqurean et al., 1991) that examined parental involvement as a predictor of post-school outcomes for adolescents with disabilities. Fourqurean et al. (1991) collected survey data from 175 students with learning disabilities after they exited high schools and found that students whose parent(s) participated in IEP meetings during grades 11 and 12 were more likely to be employed after high school (R^2 = .03).

Student support. Student support includes support from friends, family, teachers, and other adults during high school (Test & Cease-Cook, 2012). Test et al. (2009) found four studies that reported potential evidence of the impact of student support on positive post-school outcomes (Doren & Benz, 1998; Halpern, Yovanoff, Doren, & Benz, 1995; Heal, Khoju, Rusch, & Harnisch, 1999; Roessler, Brolin, & Johnson, 1990). First, Doren and Benz (1998) interviewed 212 students with disabilities 17 years and older and their parents in Oregon and Nevada. They collected data on family income, parental responsibilities, parent-child agreement on post-school goals, skills related to personal responsibilities, friends, and peers. Family income was significantly related to post-school employment for young women but not for young men with disabilities. Students who used family members and friends to find jobs were 2.33 times (for males) and 3.77 times (for females) more likely to be competitively employed than those who did not. Second, Halpern et al. (1995) assessed the impact of five predictors on post-school education: (a) scores on a functional achievement inventory, (b) participation in transition planning, (c) parental perception of students' independence, (d) parental satisfaction with

the quality of school instruction, and (e) students' satisfaction with instruction in reading, writing, math, behavior, and problem solving. Test et al. (2009) considered the last indicator – student satisfaction with instruction – to be a measure of student support in school. In the third study, Heal et al. (1999) examined three dimensions of quality of life – social relationships, employment, and independence – from a sample of 505 students with disabilities. Social relationships were a composite of five parent-reported items from the National Longitudinal Transition Study 1987/1990: (a) How well does youth get along with others? (b) How many days per week does youth see friends or family now? (c) How many days per week does youth see friends or family usually? (d) Has youth attended social groups in the past 12 months? and (e) Is youth socially isolated? Students who spent more time per week with family or friends were more likely to experience higher quality of life (r = .28). Finally, Roessler et al. (1990) surveyed 38 special education graduates and their teachers about work history, career roles, employer skills, involvement in social agencies, and life satisfaction. Students with high occupational guidance and preparation from teachers were more likely to have a higher quality of life and to be employed after high school (r = .37 for student rating; r = .56 for teacher rating).

Social skills. Social skills allow students with disabilities to interact successfully with others (Test & Cease-Cook, 2012). Test et al. (2009) found three studies that demonstrated potential evidence of the influence of high social skills on quality of life and post-school employment (Benz, Yovanoff, & Doren, 1997; Halpern et al., 1995; Roessler et al., 1990).). Halpern et al. (1995) and Roessler et al. (1990) were discussed in the previous section. Benz et al. (1997) examined the link between employment-related

social skills and post-school outcomes for students with and without disabilities, using data from a follow-along study conducted in Oregon and Nevada. They found that students who exited school with high social skills were more likely to be competitively employed (r = .43). They also found that parent-child agreement about post-school employment, students' personal responsibilities, and social relationships were not significantly correlated with post-school employment.

Community experiences. Community experiences, which resemble the concept of community social capital, are operationalized as community-based training in non-school environments that teach students skills related to transportation, mobility, recreational, leisure, and employment (Test & Cease-Cook, 2012). Test et al. (2009) found one exploratory study (White & Weiner, 2004) that provided evidence of the association between community experiences and post-school employment (r = .39).

Self-determination. Self-determination encompasses an array of skills, including problem-solving, decision-making, goal-attainment, self-regulation, self-awareness, and self-efficacy (Test & Cease-Cook, 2012). Many studies have shown that self-determination was related to successful post-school outcomes in education and employment (e.g., Halpern et al., 1995; Wehmeyer & Schwartz, 1997). Self-determination aligns with the construct of MOS in this study.

Collectively, the research relating to social capital in the special education literature is not framed or operationalized in a consistent manner. The variables previously discussed represented different constructs, from quality of life to transition. There is no overarching conceptual framework of social capital that guided the collection of those variables.

Gaps and Limitations

The literature on social capital in educational research from 2001 to 2012 addresses some but not all of the limitations that Dika and Singh (2002) had identified in their review. Despite the significant increase in the number of studies examining multiple sources of social capital, many researchers continued to focus on parental indicators. Coleman's conceptualization of social capital remained widely used despite having significant limitations. Researchers continued to use large-scale longitudinal data collected from surveys not originally designed to measure social capital and loosely combined indicators to approximate social capital. Many researchers began to evaluate the quality of student relationships with individuals in their social ecology as a proxy of social capital, which was an improvement on the use of crude quantitative indicators such as the number of parents per household and the number of times a family had moved.

Adolescents' Role in Acquiring Social Capital

Tierney and Venegas (2006) argued that the "Colemanesque" fixture on parental social capital is highly deterministic: a child born in poverty would be expected to remain there for life. If social capital plays a crucial role in advancing equitable educational outcomes, they believed that researchers should examine the role of student agency in shaping his or her own outcomes. Thus, the most notable change in the literature between 2001 and 2012 was the focus on adolescents as the primary architects of their social support network. For example, Stanton-Salazar (2001) found that some working-class ethnic minority youth were able to overcome institutional limitations by developing relationships with individuals who provided them with important resources.

Despite the growing recognition of adolescents' ability to shape their social support network, few studies have explicitly examined this variable. For example, Gonzales (2010) raised the question of whether success in school is "a matter of agency or structure" (p. 472) – that is, whether students actively build successful relationships or if positive relationship building is facilitated through social structures at school – but he failed to assess students' role as active facilitators of social capital. Sandefur et al. (2006) intended to collect indicators of social capital that were within the control of parents and adolescents, but ended up gathering traditional indicators such as parental education, family income, Catholic school attendance, and parent-school contact. To date, no study has distinguished the differential effect of the structural component and the agential component of a student's social capital on school outcomes.

Research Questions and Hypotheses

In this study, I distinguished between social capital and the process of social capital formation. I used two key features of Bourdieu's framework to develop my research hypotheses: (a) students are the primary agents in shaping their social capital and (b) the impact of students' social relationships on school outcomes depends on their ability to mobilize support. I focused on sources of social capital that were within students' ability to mobilize. Specifically, I measured students' propensity to seek help, self-efficacy for enlisting support, and help-seeking behaviors as indicators of their ability to mobilize support (the process of capital formation). I also measured the quality of students' relationships with parents, siblings, teachers, friends, peers, role models, schools, and neighborhoods as indicators of actual social capital. School-related outcomes were composed of four indicators: (a) academic achievement (based on official

records of students' most recent GPA), (b) problem behaviors (as rated by teachers), (c) emotional well-being (student self-report), and (d) career outcome expectations (student self-report).

The primary research question was: Do students with disabilities actively mobilize support to meet their needs, or is their success facilitated by existing structures at home, in school, and in communities? Secondary research questions were: (a) Does MOS have a direct effect on school outcomes? (b) Does SOS have a direct effect on school outcomes? (c) Does SOS mediate the effect of MOS on school outcomes?

Baron and Kenny's (1986) criteria for determining significant mediations were used: (a) the direct effect of the IV on the presumed mediator is significant (path *a*), (b) the direct effect of the presumed mediator on the DV is significant (path *b*), and (c) when paths *a* and *b* are controlled, the previously significant relation between the IV and the DV (path *c*) is reduced (*c'*). As Figure 1 illustrates, MOS influences SOS, which in turn, mediates effects of MOS on outcomes. Notice that there are three hypotheses: (a) MOS has a significant direct effect on outcomes, (b) SOS has a significant direct effect on outcomes, and (c) SOS mediates the effect of MOS on outcomes.

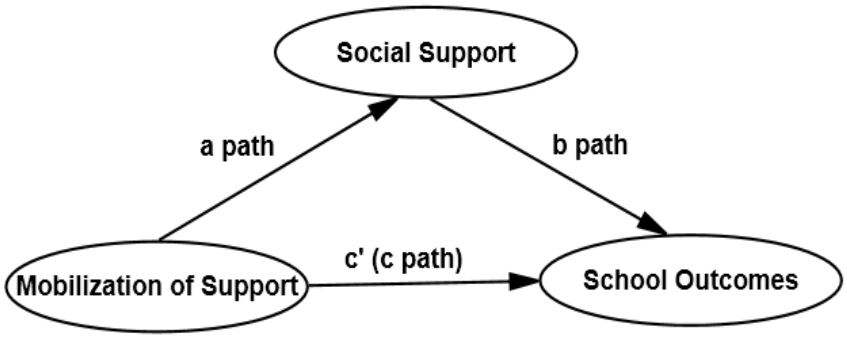

Figure 1. The mediation path.

The final hypothesis requires further justification. Theories, not data, determine the direction of the mediating variable (Kenny, 2007). One could present a compelling theory for why MOS should be the mediating variable instead of SOS. As such, the directionality of the proposed model warrants theoretical justification.

In the field of developmental psychology, Sameroff (2010) proposes a unified theory of human development that integrates the ecological system theory (Bronfenbrenner, 1977), the stage-environment fit theory (Eccles et al., 1993), and the transactional regulation theory (Sameroff & Fiese, 2000). The ecological system theory proposes that human development, from childhood to adulthood, is influenced by a variety of social settings and institutions, both directly and indirectly. The stage-environment fit theory suggests that human development is shaped by the extent to which the developmental stage of a child and characteristics of his or her social environment are mutually supportive. The transactional regulation model proposes that human development is a product of the continuous dynamic interactions between the child and the experiences provided by his or her social settings (Sameroff, 2010, p. 16). Sameroff (2010) examined the empirical evidence of these theories with subjects from infancy to adulthood and proposed the unified theory of development (depicted in Figure 2), which accounts for the dynamic transactions between a child and his or her social environment across the lifespan.

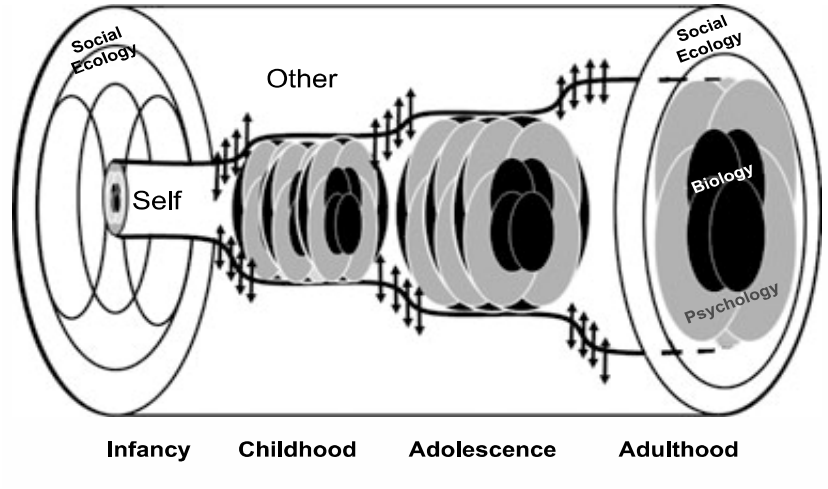

Figure 2. Arnold Sameroff's unified theory of development (2010).

The appeal of this theory is its capture of the life stage of adolescence within the entire trajectory of human development. As development proceeds, our biology and psychology change, and our environment also changes both independent from and as a consequence of our experience and development. The most relevant depiction of this theory for the current purpose is captured during the life stage of adolescence, where the self has a greater influence on the social context, while both self and context continue to transform each other in a continuous process. The directionality of my model, which starts with students' ability to mobilize support (self) and points toward the quality of their social support network (other), reflects this dynamic system.

Exploratory Group Comparisons

The literature reviewed suggests that there are differences between boys and girls (e.g., Doren & Benz, 1998; Morgan et al., 2004), white and non-white students (e.g., Martinez et al., 2004; Stanton-Salazar, 2001), and early and late adolescents (e.g., Eccles & Roeser, 2005; Kao & Rutherford, 2007; NCES, 2011) on indicators of MOS and SOS. Consequently, if a significant meditational path is established, a secondary goal of this

study is to determine whether the model is invariant across sex (boys and girls), race/ethnicity (white and non-white), grade level (9-10 and 11-12), and disability (learning disabilities (LD) and all others). I added disability to account for the unique needs of this study's targeted population. I will use a multi-group SEM approach to examine model invariance across these groups. This analysis is entirely exploratory due to the lack of a sufficient empirical base in the literature; thus, no hypotheses are proposed.

CHAPTER III

METHODOLOGY

Target participants for this study were high school students with disabilities and their teachers. The sample was selected in several steps. First, I conducted power analysis to determine the necessary sample size for recruitment. Next, I acquired approvals of the University of Oregon Institutional Review Board (UOIRB) and subsequently, the school districts review boards to recruit participants. Then, I invited school principals and special education teachers via email, phone, and face-to-face meetings to participate in this study. Participation is voluntary. No identifying information was collected.

Power Analysis

G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) was used to conduct a priori estimation of the sample size for a desired statistical power ($1 - \beta$), significance level (α), and the to-be-detected population effect size. The proposed model was fundamentally regression-based, so the linear regression test (size of slope) in G*Power was selected. A sample size of 82 students was deemed necessary to conduct the analyses with .8 statistical power to detect an effect of .30; α was fixed at .05. These numbers were consistent with Cohen's (1988) recommendation that a medium effect for regression or correlation is around .30. According to Cohen (1990), a sample size of 85 was sufficient to detect an effect with .8 statistical power when using the two-tailed significance level of .05 (Cohen, 1990). Power of .8 is considered adequate by convention (Cohen, 1990).

In addition to the regression-based power analysis, I also conducted a SEM-based power analysis to determine the appropriate sample size. There is no consensus in the literature in SEM or mediation analysis on how to determine the necessary sample size to

achieve adequate power (Kaplan, 1995; Fritz & MacKinnon, 2007). Fritz and MacKinnon (2007) found that approximately 80% of the 166 psychological studies that tested mediation processes published between 2000 and 2003 had fewer than 400 participants (range = 20 to 16,466; median = 187). Kline (2011) and Tanaka (1987) recommended 20 participants per estimated parameter. Some methodologists, including Kline (2011), have considered the 20 to 1 ratio to be unrealistically high (Kenny, 2012), and have suggested that a 10 to 1 ratio of sample size to estimated parameters is more realistic. Bentler and Chou (1987) recommended a 5 to 1 ratio of participants to estimated parameters. Given that the measurement model in this study consists of 33 free parameters (15 path coefficients plus 18 variances, see Figure 3), a sample size of 165 (for a 5:1 ratio) to 330 (for a 10:1 ratio) would be adequate.

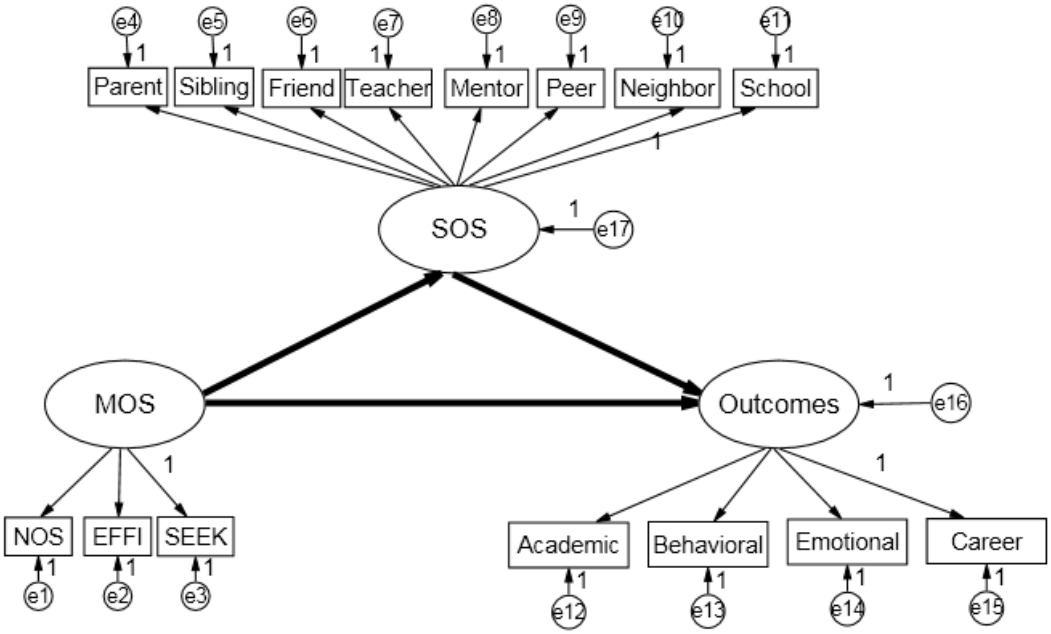

Figure 3. The full a priori model. MOS = mobilization of support; SOS = social support; NOS = network orientation scale; EFFI = self-efficacy for enlisting support; SEEK = help-seeking behaviors. *e* = errors or residuals. Variances are not drawn.

Participant Recruitment

The UOIRB granted approval for study procedures contingent on local districts' approval. Consequently, I applied to conduct research in 16 districts. Four were not accepting research proposals. Of the remaining 12 districts, two never responded despite three follow-up phone calls and emails. Three districts denied my request, even though I have had verbal support from their principals and teachers. One of those districts gave no reason for the denial, one said that schools were already overwhelmed with testing, and one district said that my study has no direct benefits to teachers and students. One district was still reviewing my proposal as of this write-up. Table 1 summarizes key characteristics of the six districts from three states that granted permission for me to recruit participants in their schools. Table 2 displays school characteristics.

Table 1

Characteristics of Districts (n = 6)

District	Locale	Location	School*	Teacher*	Student*
1	Fringe Rural	Midwest	1	1	15
2	Fringe Town	Northwest	1	1	14
3	Small City	Northwest	1	3	59
4	Midsize City	Northwest	2	7	83
5	Large City	Northwest	2	2	15
6	Large City	Southwest	2	2	20
Total			9	16	206

Note. Asterisks denote the number of participants.

Inclusion criteria. Three criteria were used to select teachers: (a) licensed special education teachers, (b) working directly with students with disabilities, (c) in public high schools. Three criteria were used to select students: (a) could read at least at the fourth grade level, (b) receiving special education services (c) in public high schools.

Response rate. Four response rates were considered: (a) the district, (b) the principal, (c) the teacher, and (d) the student. Six out of 12 districts approved my research proposal, yielding a 50% response rate. The principal response rate varied from 17% in one district to 100% in another (M = 53.33%). I was unable to calculate the teacher response rate due to the use of snowball sampling. Teachers were asked to keep a record of how many students had a chance to learn about this study and how many actually participated. The student response rate, calculated by dividing the number of students who participated by the total number recruited, ranged from 35% to 100% (M = 79%).

Table 2

Characteristics of Schools Based on 2011 Official Records (n = 9)

		Percentage of Student Subgroup			
School	S:T Ratio	F/RLP	White	Black	Hispanics
1	24:1	29.0	79.0	4.0	9.0
2	13:1	30.0	97.0	1.0	0.5
3	18:1	44.0	76.0	12.0	12.0
4	19:1	35.0	80.0	2.0	12.0
5	21:1	24.0	76.0	6.0	8.0
6	13:1	67.0	20.0	60.0	13.0
7	24:1	29.0	88.0	1.0	7.0
8	18:1	44.0	17.0	6.0	72.0
9	16:1	39.0	16.0	2.0	78.0

Note. S:T = student to teacher ratio. F/RLP = percentage of students receiving free/reduced lunch prices.

Sample

Sixteen special education teachers and 206 high school students with disabilities participated in this study (13:1 student to teacher ratio).

Students. Participants' ages ranged from 13 to 19 years (M = 16.20, SD = 1.4). Eleven percent (n = 23) reported to be employed and were working on an average of 15

hours per week (*SD* = 10). Thirty percent (*n* = 62) reported to be "Not at all religious," 47% (*n* = 97) were "Somewhat religious," 13% (*n* = 27) were "Quite religious," and 8% (*n* = 16) were "Extremely religious." Forty-eight percent (*n* = 98) indicated that they definitely wanted to attend college, 42% (*n* = 86) reported "Maybe," 5% (*n* = 10) did not plan on attending college after high school, 5% (*n* = 11) planned to join the military, and 0.5% (*n* = 1) said that she would not graduate from high school.

Fifty-seven percent (*n* = 118) reported that they lived with two parents, 31% (*n* = 63) lived with one parent, 3% (*n* = 6) lived on their own, and 9% (*n* = 18) had other living arrangements. Eleven percent (*n* = 21) spoke a language at home other than English; 86% (*n* = 18) of those students spoke Spanish. Approximately 11% (*n* = 22) said they had moved once within the last year, 6% (*n* = 12) had moved twice, and 6% (*n* = 13) had moved three or more times within the last year.

Teacher-reported class size ranged from 3 to 28 students (*M* = 15, *SD* = 6). Fifty-eight percent (*n* = 121) were in a self-contained classroom setting, 4% (*n* = 9) were in a general education setting, 4% (*n* = 8) were in a collaborative-team teaching classroom setting, and 34% (*n* = 71) were in other types of settings. Teachers reported that they knew 21% (*n* = 43) of students "very well", 45% (*n* = 94) of students "well", 26% (*n* = 54) of students "somewhat well", 6% (*n* = 12) of students "a little", and 3% (*n* = 6) of the students "not well". According to teacher ratings, 3% (*n* = 6) of students came from high socio-economic status (SES), 37% (*n* = 77) came from middle SES, and 40% (*n* = 82) came from low SES. Teachers did not know the SES of the remaining 21% (*n* = 44) of students. Table 3 provides additional demographic information. Notice that males were overrepresented in the sample. This was consistent with the higher proportion of males

than females receiving special education services in the population: 66.6% in 2001 and 85.8% in 2009 (NLTS2, 2013).

Table 3

Characteristics of Students (N = 206)

Characteristic	*n*	Percentage
Sex		
Male	132	64.0
Female	74	36.0
Grade level		
9th	58	28.0
10th	40	19.0
11th	50	24.0
12th	58	28.0
Race/Ethnicity		
White	115	56.0
Latino	39	19.0
Mixed	16	8.0
Black	13	6.0
Native American	9	4.5
Asian/Pacific	2	1.0
Other	12	6.0
Disability label		
Learning disabilities	152	73.0
Autism	19	9.0
Emotional behavioral disorders	15	7.0
Other health impairments	11	5.0
Intellectual disabilities	8	4.0
Multiple disabilities	2	1.0
Traumatic brain injury	1	0.5
Time spent in general education		
< 40% of the day	61	29.0
40 – 79% of the day	35	17.0
80% or more of the day	113	54.0

Teachers also ranked each student by level of academic achievement out of the entire class. I then coded teachers' rankings into low, average, or high achievement levels. A chi-square test of independence was performed to examine the relation between sex and academic ranking, which tested the null hypothesis that male and female students

were equally likely to be ranked low, average, or high achievers. The relationship between these variables was not significant, χ^2 (2, N = 206) = 5.28, p = .072. A chi-square test of independence was also performed to determine if students in grades 9, 10, 11, and 12 were distributed differently across academic achievement rankings. Results indicated no significant difference, χ^2 (6, N = 206) = 5.84, p = .442. Sample proportions are summarized in Table 4.

Table 4

Academic Ranking by Sex and Grade Level (N = 206)

	Low % (*n*)	Average % (*n*)	High % (*n*)	Total % (N)
Sex				
Male	27.0 (55)	19.0 (40)	18.0 (37)	64.0 (132)
Female	9.0 (19)	14.0 (29)	13.0 (26)	36.0 (74)
Total	36.0 (74)	34.0 (69)	31.0 (63)	100.0 (206)
Grade level				
9	8.0 (17)	8.0 (17)	12.0 (24)	28.0 (58)
10	6.0 (13)	8.0 (16)	5.0 (11)	19.0 (40)
11	9.0 (19)	9.0 (18)	6.0 (13)	24.0 (50)
12	12.0 (25)	9.0 (18)	7.0 (15)	28.0 (58)
Total	36.0 (74)	34.0 (69)	31.0 (63)	100.0 (206)

Teachers. One male and 15 female teachers participated in this study. Years of teaching experience of all 16 teachers ranged from 4 to 32 years (M = 14, SD = 9). One teacher has a doctoral degree, the rest had Master's. Fourteen teachers identified as white, one as Latina, and one as Asian. Teachers were asked to indicate the core academic subject for which they were responsible: seven taught English Language Arts, four taught mathematics, three taught social studies, one taught science, and one did not specify. Teachers were asked to indicate how connected they felt to their students, colleagues, and administrators on a scale from 1 (*not at all connected*) to 5 (*very well connected*). Results are reported in Table 5.

Table 5

Teachers' Connectedness to Others

Connectedness	*M*	*SD*	*Min.*	*Max*
Students	4.43	0.85	2	5
Other teachers	3.29	0.91	2	5
Immediate supervisor	3.14	1.23	1	5
Administrators	3.00	1.18	1	5
Professionals in the field	2.93	1.14	1	5

Measures

After selecting the appropriate measures and checking for issues related to format, item wordings and scales, and clarity of directions, I piloted the surveys with five high school students with and without disabilities and one special education teacher. I used their feedback to revise the surveys prior to distributing them to research participants.

Pilot. First, I administered the student survey to a white, male, general education student in grade 9. He completed the survey in 23 minutes and provided feedback on the wording of items, survey format, clarity of directions, and the likelihood of survey fatigue. I also solicited feedback from him regarding the ordering of each measure, if the switching of scales (from agree/disagree to often/not often) from one measure to the next was confusing, and how he would feel about completing the teacher-student relationship items if his teachers were present. I used his feedback to revise the format of the survey. Specifically, I changed the order of the measures by placing shorter measures in between lengthier ones. I also revised the directions to make them consistent across all scales.

Subsequently, I piloted the surveys to four high school students with mild to moderate disabilities and one of their special education teachers. The four students were in grades 9, 10, 11, and 12; three males, one female. All were white. I administered the survey to two students and their teacher administered the survey to the other two students

in a separate location. Students completed the survey in 31 to 46 minutes (M = 39). I asked these four students the following questions: Did you understand the purpose of the survey? Overall, did you find the survey easy to understand? Did you feel comfortable answering the questions? Were any words confusing, upsetting, or embarrassing? How did you feel about the length of the survey? How did you feel about completing items about your relationship with your teachers? Would you feel more comfortable if the researcher instead of your teacher was giving the survey? Were the answer choices reasonable? Did any item require you to think too long? Which part of the survey stood out to you? Students reported that the survey was easy to understand and was relatively shorter compared to what they have to take in school. They felt as if they were doing an exercise to prepare for a job interview. Students provided specific suggestions for certain wordings of some items, such as the item "I feel alone or apart when I am with my friends." Students said that the word "apart" was confusing and suggested changing it to "lonely." Students also mentioned that their school did not use grade point averages and suggested an item that allows them to report letter grades.

Demographics. Students provided information about their age, sex, grade, race/ethnicity, family education, number of siblings, mobility, and primary language(s) spoken at home. Teachers reported students' disability status as recorded on their IEPs. Teacher demographics include sex, race/ethnicity, years of teaching experience, and licensure. See Appendices A, B, and C for the full student and teacher surveys.

MOS measures. MOS has three dimensions: network orientation, self-efficacy for enlisting support, and help-seeking behaviors.

***Network orientation*.** The Network Orientation Scale (NOS; Vaux et al., 1986) is a single-dimension scale designed to assess one's expectations, attitudes, and beliefs regarding the desirability and effectiveness of seeking help from one's support network (e.g., "It really helps when I am angry to tell a friend what happened" and "Some things are too personal to talk to anyone about"). Both positive and negative network orientation items were used in order to minimize acquiescence (Vaux et al., 1986). Participants rated items on a 4-point agree-disagree format. Vaux et al. (1986) collected data on four samples of college students and one sample of adults (sample sizes ranged from 37 to 100) and found adequate internal consistency – Cronbach's alphas ranged from .60 to .88. Vaux et al. (1986) found three items with low loadings (< .35) but kept those items because the researchers believed that they represented important aspects of the construct. The NOS had good criterion validity with measures of social support and personality. In the present sample, Cronbach's alphas were .68 for the entire scale (20 items). Factor-based total scores were calculated by averaging the total of all items in each factor.

Self-efficacy for enlisting support. Two subscales from Bandura's Multidimensional Scales of Perceived Self-Efficacy (MSPSE; Bandura, 1990) were used to assess the extent to which students believed they were capable of mobilizing support. The MSPSE has 57 items that measure nine domains of self-efficacy on a 7-point Likert scale ranging from 1 (*not very well*) to 7 (*very well*). The MSPSE is widely used and demonstrates good reliability and validity (Choi, Fuqua, & Griffin, 2001; Miller, Coombs, & Fuqua, 1999). Two of those nine subscales were used to measure MOS: self-efficacy for enlisting social resources (SE-SR; four items) and self-efficacy for enlisting parental and community supports (SE-PC; four items). Data from a sample of 651

undergraduate college students revealed satisfactory reliability. Cronbach's alphas were .63 for the SE-SR and .79 for the SE-PC (Choi et al., 2001). Authors of the MSPSE provided anchors only for the odd-numbered scales, so only 1, 3, 5, 7 were defined (i.e., 1 = *not very well*, 7 = *very well*). During the pilot of the survey, participants reported that they had a hard time figuring out what the blank spaces in between were (i.e., 2, 4, and 6). In response to this concern and in consideration of this study's sample, I removed those empty categories. Instead of a 1 to 7 scale, this study used a 1 to 4 scale ranging from 1 (*not well at all*) to 4 (*very well*). The item "How well can you get your brothers or sisters to help you with a problem?" was removed from subsequent analyses because 37 students (18.5%) reported having no siblings. Cronbach's alphas for the present sample were .74 for the entire scale (7 items), .67 for the SE-SR (4 items), and .65 for the SR-PC (3 items). Factor-based total scores were calculated by averaging the total of all items in each factor.

Help-seeking behaviors. Neither the NOS nor the two MSPSE subscales directly assessed specific help-seeking behaviors. In response to a committee member's suggestion, I created 15 items to evaluate the extent to which students exhibited help-seeking behaviors with parents, friends, and teachers in the last 30 days. Students responded to items such as "In the last 30 days, how often have you asked a teacher for advice about something important to you?" on a 4-point Likert scale ranging from 1 (*never*) to 5 (*very often*). Cronbach's alphas for this study's sample were .93 for the entire scale (15 items), .91 for the parent subscale (5 items), .88 for the friend subscale (5 items), and .85 for the teacher subscale (5 items). Factor-based total scores were calculated by averaging the total of all items in each factor.

SOS measures. SOS was measured using students' self-report of the quality of their relationships with parents, friends, teachers, school, siblings, peers, neighborhood, and mentors.

Parent and friend support. Students assessed the quality of relationships with parents and friends using the 24-item short version (Nada Raja, McGee, & Stanton, 1992) of the original 53-item Inventory of Parent and Peer Attachment (IPPA: Armsden & Greenberg, 1987). Although this measure uses "peer" in its title, all items on the peer subscales were about individuals whom students considered to be good "friends." To maintain the distinction between friendship and peer relationship in this study, I will use "friend" to refer to this particular measure's peer subscales. The IPPA was developed based on attachment theory (Bowlby, 1977) to assess adolescents' perceptions of the affective and cognitive dimensions of relationships with parents and close friends. Nada Raja et al. (1992) created a 24-item short version of the IPPA using items with the highest item-total correlation coefficients within each subscale. The 24-item brief version was equally divided between the parents and friend scales, and 11 items were reverse-coded. Responses followed a 4-point Likert scale from 1 (*almost never true*) to 4 (*almost always true*). Nada Raja et al. (1992) tested the brief version with a sample of 935 adolescents in New Zealand and obtained Cronbach's alphas of .82 for the parent scale and .80 for the friend scale. The brief IPPA had shown significant correlation with measures of psychological well-being (Nada Raja et al., 1992). Montague et al. (2010) reported Cronbach's alphas of .83 (parent) and .82 (friend) from a sample of 212 adolescents (91% African American and/or Hispanic) who were at risk for developing emotional and behavioral disorders in a large, urban school district in the US. Montague

et al. (2010) found that parental relationship was a strong predictor of internalizing and externalizing behaviors whereas friendship predicted only internalizing behaviors. For this study's sample, Cronbach's alphas were .86 for the brief IPPA parent scale (12 items), .76 for the trust factor, .70 for the communication factor, and .79 for the alienation factor. For the brief IPPA friend scale, Cronbach's alphas from this study's sample were .86 for the entire scale (12 items), .69 for trust, .86 for communication, and .78 for alienation. Factor-based total scores were calculated by averaging the total of all items in each factor.

Teacher support. Similar to the IPPA, the Inventory of Student-Teacher Relationships (IT-SR; Murray & Zvoch, 2011) was designed to assess early adolescents' general perception of (a) trust ("I tell my teachers about my problems and troubles"), (b) communication ("If my teachers know something is bothering me, they ask me about it"), and (c) alienation ("My teachers don't understand what I'm going through these days"). Responses were scored on a 4-point Likert scale ranging from 1 (*almost never or never true*) to 4 (*almost always or always true*). The IT-SR had good internal consistency, with Cronbach's alphas ranging from .73 (alienation) to .85 (trust) to .88 (communication; Murray & Zvoch, 2011). For this study's sample, Cronbach's alphas were .84 for the entire scale (19 items), .79 for trust, .89 for communication, and .82 for alienation. Factor-based total scores were calculated in the same manner as the IPPA brief.

Sibling, peer, and neighborhood support. The Hemingway Measure of Adolescent Connectedness (MAC; Karcher & Sass, 2010) is a 57-item self-report measure that assesses adolescents' involvement in specific relationships, contexts, and activities. This study used three of the ten subscales on the MAC: adolescents'

connectedness to siblings, peers, and neighborhoods. Students who have no siblings were instructed to skip these items. Students rated these items on a 5-point Likert scale ranging from 1 (*not at all true*) to 5 (*very true*). Each subscale had one reverse-scored item to control for patterned rating. Connectedness to siblings assessed youth's involvement with and caring for their siblings (e.g., "I enjoy spending time with my sibling(s)"). Connectedness to peers evaluated feelings about peers and classmates (e.g., "I like working with my classmates"). Connectedness to neighborhood measured the degree to which youth felt their neighborhoods to be supportive and the quality of their relationships with neighboring youth (e.g., "I hang out a lot with kids in my neighborhood"). Karcher and Sass (2010) reported these reliability coefficients from a sample of 3,598 middle school students: .90 (siblings), .70 (peers), and .86 (neighborhood). The sibling factor was dropped from the model because 37 students (18.5%) reported having no siblings. For the present sample, Cronbach's alphas were .75 and .84 for the peer and neighborhood subscales, respectively. Total scores were calculated separately for each subscale by averaging the sum of all items in each.

Mentor support. The Influence of Others on Academic and Career Decisions Scale (IO) was used to measure the degree of support students receive from mentors, defined as adults outside the family and school (Nauta & Kokaly, 2001). The IO has 15 items and two factors: guidance and inspiration. The instrument uses a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Nauta and Kokaly (2001) conducted four studies (N = 41, 145, 183, and 190) with undergraduate college students (mean age was 20.18 years). They found that the internal consistency coefficients for the guidance subscale ranged from .89 to .94 and the coefficients for the inspiration subscale

ranged from .89 to .91. Other studies that used the inspiration subscale reported internal consistency alphas of .87 (Nauta, Saucier, & Woodard, 2001) and .91 (Quimbly & DeSantis, 2006). Evidence of construct validity was supported with measures of general social support, occupational information, career indecision, career certainty, and social desirability (Nauta & Kokaly, 2001). For this study's sample, Cronbach's alphas were .81 for the entire scale, .77 for the guidance factor, and .66 for the inspiration factor. Factor-based total scores were calculated by averaging the total of all items in each factor.

School bonding. School bonding was measured with seven items such as "I look forward to going to school," and "I like to take part in class discussion and activities" (Murray & Greenberg, 2001). Students rated these items on a 4-point Likert scale ranging from 1 (*almost never or never true*) to 4 (*almost always or always true*). Murray and Greenberg (2001) found significant correlations between this measure of school bonding and measures of school competence (r = .33 to .50) on a sample of students in grades 5 and 6 with (n = 96) and without disabilities (n = 193). The researchers reported an internal consistency of .82 for the entire scale. The Cronbach's alpha from this study's sample was .85. Total scores were calculated by averaging the sum of all items.

School-related outcomes. Four school-related outcomes were examined: academic, behavioral, emotional, and career.

***Academic outcome*.** Students' grade point averages (GPA) over the most recent grading period, which teachers collected from students' official records, were used as indicators of students' academic performance.

Behavioral outcome. Thirty items on the problem behaviors subscale of the Social Skills Improvement System-Teacher Rating Scale (SSIS; Gresham & Elliott,

2008) were used to assess four dimensions of students' behaviors: externalizing, internalizing, bullying, and hyperactivity/inattention. The SSIS is the second generation of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), a widely used and highly researched measure of social skills, problem behaviors, and academic competence. The SSIS has strong evidence of validity and reliability, with an internal consistency coefficient of .96, test-retest reliability coefficient of .92, and inter-rater reliability coefficient of .58 (Gresham & Elliot, 2008). Analyses of patterns of correlations with other measures provide support for the criterion-related validity of the SSIS, including the SSRS, the Behavior Assessment System for Children-2nd Edition (BASC-2), the Walker-McConnell Scale of Social Competence and School Adjustment (SSCSA), and the Vineland Adaptive Behavior Scales-2nd Edition (Vineland-II). The SSIS technical manual provides substantial psychometric evidence of reliability and validity (Gresham & Elliott, 2008). Teachers rated students on a 4-point Likert scale ranging from 1 (*never*) to 4 (*always*) on items such as, "Acts without thinking," "Talks back to adults," and "Keep others out of social circles." Internal consistency alpha for this subscale was .95, test-retest reliability was .83, and inter-rater reliability was .62 (Gresham & Elliot, 2008). The Cronbach's alpha from this study's sample was .93. Total scores were calculated by averaging the sum of all items.

Emotional outcome. The 6-item Life Satisfaction Scale (LSS), a brief version of the Multidimensional Students' Life Satisfaction Scale (Gilman, Huebner, & Laughlin, 2000) was used to assess students' life satisfaction in six domains: family, friends, school, self, living environment, and overall life. Students responded on a 7-point Likert scale ranging from 1 (*terrible*) to 7 (*delighted*). Zullig, Valois, Huebner, Oeltmann, and

Drane (2001) used the LSS with high school students and reported an internal consistency reliability of .85. Zullig et al. (2001) also found strong evidence of convergent and discriminant validity of the LSS with factors on the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). The Cronbach's alpha was .81 in the present sample. Total scores were calculated by averaging the sum of all items.

Career outcome. The Outcome Expectation Scale (OES; McWhirter, Crothers, & Rasheed, 2000) was developed to assess high school students' career outcome expectations (e.g., "I will be successful in my chosen career/occupation," "The future looks bright for me"). Students rated six items on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency was .83 for a sample of 95 students in grade 10 from an urban high school in a midsized Midwestern city (McWhirter et al., 2000) and .84 for a sample of 322 urban high school students (Kenny & Bledsoe, 2005). Test-retest reliability over 9 weeks was .59, as obtained from a sample of 95 students in grade 10 (McWhirter et al., 2000). McWhirter et al. (2000) estimated concurrent validity in a sample of 110 students in grade 10 using an outcome expectation measure and found a significant correlation of .54. The Cronbach's alpha was .87 in the present sample. Table 6 summarizes the final measures used in this study.

Procedures

Consent. I emailed recruitment materials to principals and teachers up to two times. Respondents who agreed to participate were followed up via email, phone, or in person, where I provided further information about this study, including the purpose, risks and benefits of participation, their roles, and compensation. Active parent consent

procedures were used in three districts. In one district, Spanish versions of parent consent and student assent forms were provided. See Appendices D to G for consent forms.

Table 6

Measures and Reliabilites in this Study (N = 206)

Measure (α)	Subscales (# of items)	α	Source	Scale
1. NOS (.68)	Network orientation (20)	.68	Student	1 - 4
2. MSPSE (.74)	Social resources (4)	.67	Student	1 - 4
	Parent & community (3)	.65		
3. Help-seeking (.93)	Parent (5)	.91	Student	1 - 4
	Peer (5)	.88		
	Teacher (5)	.85		
4. IPPA_Brief Parent (.86)	Trust (4)	.90	Student	1 - 4
	Communication (4)	.81		
	Alienation (4)			
5. IPPA_Brief Friend (.78)	Trust (4)	.89	Student	1 - 4
	Communication (4)	.82		
	Alienation (4)			
6. ITSR (.84)	Trust (5)	.79	Student	1 - 4
	Communication (8)	.89		
	Alienation (6)	.82		
7. MAC (.86)	Peers (4)	.75	Student	1 - 5
	Neighbors (6)	.84		
8. IO (.81)	Guidance (7)	.85	Student	1 - 5
	Inspiration (8)	.77		
9. School Bonding (.85)	Bonding (7)	.85	Student	1 - 4
10. GPA	Student's GPA	-	Teacher	0 - 4
11. SSIS (.93)	Problem behavior (30)	.93	Teacher	1 - 4
12. LSS (.81)	Global life satisfaction (6)	.81	Student	1 - 7
13. OES (.87)	Career outcome expectations (6)	.87	Student	1 - 4

Note. α = Cronbach's alpha reliability coefficient.

Survey implementation. To ensure the consistency of survey implementation across settings, all teachers were instructed to follow a 16-step checklist (see Appendix H). The checklist was divided into three sections: before, during, and after survey administration. For example, before survey administration, teachers were instructed to "Create a survey ID for each student that begins with your initial + a 3-digit number +

student's first initial." During survey implementation, teachers were reminded to "Address any questions that students may have." After survey implementation, teachers were asked to "Seal student surveys in the provided envelopes." All surveys were available both online via Qualtrics and in paper-and-pencil formats. Participants chose the survey format most suitable to their needs. Students and teachers were instructed to complete the surveys outside of regular classroom hours, such as before or after school, in order to minimize interference with regular instruction. The student questionnaire took approximately 30 to 40 minutes to complete. Teachers completed a two-page questionnaire about themselves and a four-page rating for each student, which took approximately 5 to 10 minutes.

Model Identification

SEM models can be under-identified (fewer known than unknown parameters), identified (same number of known and unknown parameters), or over-identified (more known than unknown parameters). Only over-identified models allow for the exploration of parameter estimates to determine if the model is indeed a reasonable representation of the phenomenon in question. According to the modified model (Figure 3), the number of parameters to be estimated was 30 (14 regression weights plus 16 variances). The degrees of freedom were 75 (105 minus 30), yielding an over-identified model.

Data Analysis

Rationale for SEM. SEM accounts for measurement errors, allows for the simultaneous examination of multiple variables, and allows variables to correlate. As such, there is no need to control for other variables in order to examine a particular relationship between a specific predictor and criterion variable.

SEM is theory-driven rather than data-driven because it tests models that are conceptually derived a priori (Kline, 2011). As such, it is an appropriate technique for analyzing non-experimental data. However, "a priori does not mean exclusively confirmatory" (Kline, 2011, p. 8). In a strictly confirmatory application, researchers test only one model and reject or accept that sole model based on data. In a less restrictive application, researchers can use SEM to test alternative models or to generate models. Model generation is most commonly used and is the route that I have chosen. Model generation begins with an initial model that might not fit, which is subsequently modified and tested again with the same data (Jöreskog, 1993). The goal is to arrive at a model that: (a) makes theoretical sense, (b) is reasonably parsimonious, and (c) has acceptable fit to the data (Kline, 2011).

Data preparation. Descriptive analysis was conducted using SPSS 20.0 for Mac (IBM, 2011). SEM was performed using Amos 18.0 for Windows (Arbuckle, 2009). The raw data were screened for the following problems prior to running analyses: missing data, outliers, multicollinearity, and the assumptions of normality, linearity, and homoscedasticity.

Missing data. The best approach to treating missing data is prevention (Kline, 2011). Consequently, I took an assertive tracking approach that involved working closely with teachers to encourage students to be thoughtful about participating in this study. If data loss was ignorable (occurred randomly and occurred less than 2% on any single variable), then the method used to deal with missing data would be inconsequential (Kline, 2011). If data loss occurred systematically, then full information maximum likelihood (FIML) would be used as the method of treatment (Little & Rubin, 2002).

Missing data occurred only on the student surveys. Five students (2.4%) missed entire sections of the survey, so I contacted their teachers and asked if those students could complete those sections, which they did. Nine students (4.4%) had missing demographics such as age and primary language spoken at home, so I contacted their teachers to acquire this information. Another nine students skipped items on the survey. The number of items skipped ranged from one to five out of a total of 147 items (0.68% to 3.40%), thus, the amount of data loss was ignorable. I used the FIML option in Amos to impute the maximum likelihood based values for these missing data.

Outliers. I used Mahalanobis distances results in Amos to determine which observations were contributing to the sample's departure from multivariate normality. Mahalanobis distances revealed six significant multivariate outliers. I checked each of these six students' surveys to make sure that there were no data entry errors. I found that these students could reasonably belong to the intended sample, so I decided to keep them.

Assumption of normality. Research has found that maximum likelihood (ML) estimation might still perform well with some departures from multivariate normality (Hu, Bentler, & Kano, 1992). Researchers have argued that the importance is not whether a sample has a multivariate normal distribution, but that parameter estimates are trustworthy when data are multivariate non-normal (Gao, Mokhtarian, & Johnston, 2008). Amos evaluates multivariate kurtosis using Mardia's test, of which a critical ratio (c.r.) of 1.96 or less is required for a sample to be considered multivariate normal. Results from Amos showed a departure from multivariate normality, c.r. = 7.21. Instead of deleting the six outliers, I used generalized least squares (GLS) as the method of estimation in addition to ML. GLS is a more robust method when the assumption of multivariate

normality is violated. Inspection of bivariate scatterplots, P-P plots, and histograms revealed no significant departures from univariate normality, linearity, or homoscedasticity. As shown in Table 7, the skewnesses and kurtoses of distributions of the outcome variables are within the acceptable range of –2.0 to +2.0 (Muthén & Kaplan, 1985).

Table 7

Assessment of Normality

Variable	Skewness	*SE* of Skewness	Kurtosis	*SE* of Kurtosis
Academic	-0.33	0.17	-0.17	0.34
Behavioral	1.27	0.17	1.58	0.34
Emotional	-0.56	0.17	-0.00	0.34
Career	-0.09	0.17	-0.14	0.34

Multicollinearity. There is no consensus on what constitutes "too high" of a correlation between variables: .80 is often cited as the guideline, but problems can also occur at a moderate .40 (Morrow-Howell, 1994). Zero-order correlations between all independent variables in this study ranged from .24 to .59 (see Table 9). Kline (2011) recommends using a regression diagnostics procedure which involves calculating the squared multiple correlation (R^2) between each variable and all of the rest. If R^2 was greater than .90 for a variable analyzed as the criterion, he suggests eliminating that variable on the basis of redundancy. Following his recommendation, I ran several multiple regressions, each with a different variable as the criterion and the rest as predictors. R^2 ranged from .09 to .46, so all variables were retained.

Assessment of fit. Four goodness-of-fit indices were used to assess how well the model fit the data: the chi-square approximation of the discrepancy function (χ^2), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the

root mean square error of approximation (RMSEA). The chi-square test of significance was selected because it is one of the most commonly used indices, although it is dependent on sample size. CFI, SRMR, and RMSEA have been found to perform well with respect to detecting model misspecification and do not depend on sample size (Jackson et al., 2009). Hu and Bentler's (1999) criteria for good fit were used. Fit is considered adequate if CFI values are ≥ .90, and better if they are ≥ .95. The cut-off value for SRMR is < .08. RMSEA is ≤ .08 for moderate fit and ≤ .06 for good fit.

Mediation analysis. In the current study, I used the bootstrap method to assess mediation. The bootstrap is a resampling strategy that uses original sample data as a population reservoir to withdraw random samples of size *n* with replacement in order to estimate the total and indirect effects (Efron & Tibshirani, 1993). The bootstrap is the recommended method of mediation analysis for small to moderate sample sizes and for when there is an a priori belief that the effect size is small (Shrout & Bolger, 2002). The bootstrap method also has more power and yields more precise standard errors than regression-based methods. It also places greater emphasis on confidence intervals over *p* values (Shrout & Bolger, 2002; Fritz & MacKinnon, 2007). In the present study, the computation of bootstrap distributions was performed using Amos 18.0 for Windows (Arbuckle, 2009).

Measurement Models

Amos 18.0 for Windows (Arbuckle, 2009) with ML estimation was used to run a series of confirmatory factor analyses (CFA) to assess the adequacy of the measurement model of the three latent constructs (MOS, SOS, and Outcome). Many problems with SEM models, such as the lack of fit, are due to measurement component issues that can

be identified with CFAs (Jackson, Gillaspy, Jr., & Purc-Stephenson, 2009; Schreiber, Stage, King, Nora, & Barlow, 2006; Thompson, 2004). As part of this process, I examined factor loadings, unique variances, modification indices, and fit indices to ensure that measured indicators factored as hypothesized onto their respective latent variables. Indicators with non-significant or low loadings ($ß < .50$) were removed and Hu and Bentler's (1999) recommended fit indices were applied (i.e., CFI ≥ .95, SRMR < .08, RMSEA ≤ .06).

Table 8 displays results from CFAs, including factor loadings, fit indices, squared multiple correlations, and unique variances. Post-hoc modifications were conducted due to poor model fit. Although the outcome model had good fit, it had no significant factor loadings. Consequently, outcome measures were examined separately. After eliminating indicators with non-significant and low loadings, I examined modification indices for the MOS model first. Results revealed that SE-PC was highly correlated with the parent help-seeking factor. I dropped SE-PC and retained SE-SR. Even though SE-SR had a low factor loading, its inclusion improved model fit significantly. SE-SR also represents a theoretically significant construct that was important to include in the MOS model.

Next, I examined modification indices of the SOS model, which revealed that residuals of the parent trust and communication subscales were correlated, so I combined those two factors to form one indicator of parent support. I did the same for the teacher trust and communication factors, because their residuals were also correlated. After making these modifications, the model had good fit (see Table 8). Figures 4 and 5 display the final measurement models along with standardized parameter estimates. All factor loadings were significant, $p < .001$.

Table 8

Standardized Parameter Estimates from CFA

Variable	Standardized factor loadings (ß) MOS	SOS	Outcome	R^2	δ
NOS	.27			.08	.92
SE-SR	.44***			.19	.81
SE-PC	.56***			.31	.69
Parent help-seeking	.80***			.63	.37
Peer help-seeking	.64***			.41	.59
Teacher help-seeking	.82***			.67	.33
Parent trust		.60***		.36	.64
Parent communication		.57***		.32	.68
Parent alienation		-.25***		.06	.94
Friend trust		.37***		.13	.87
Friend communication		.43***		.18	.82
Friend alienation		-.04		.002	.998
Teacher trust		.71***		.50	.50
Teacher communication		.68***		.47	.53
Teacher alienation		-.14		.02	.98
Mentor guidance		.65***		.43	.57
Mentor inspiration		.46***		.21	.79
Peer connectedness		.69***		.48	.52
Neighbor connectedness		.45***		.20	.80
School bonding		.66***		.43	.57
Academic			.16	.02	.98
Behavioral			-.18	.03	.97
Emotional			.72	.52	.48
Career			.47	.22	.78
Factor Correlations					
MOS	1				
SOS	.84	1			
Outcome	.72	.89	1		
Fit indices of a priori measurement models					
p (χ^2)	< .001	< .001	.19		
CFI	.84	.53	.96		
SRMR	.08	.14	.04		
RMSEA	.14	.18	.06		
Fit indices of final measurement models					
p (χ^2)	.761	.551			
CFI	1.00	1.00			
SRMR	.01	.01			
RMSEA	< .001	< .001			

Note. R^2 = squared multiple correlation. δ = error variance; *** p < .001.

All factor loadings for MOS and SOS were significant. Help-seeking behaviors towards teacher had the strongest linear relationship with MOS, followed by help-seeking behaviors towards parents, then peers, and lastly, self-efficacy for enlisting social resources. Teacher support had the strongest relationship with SOS, followed by peer, then mentor, then parent support.

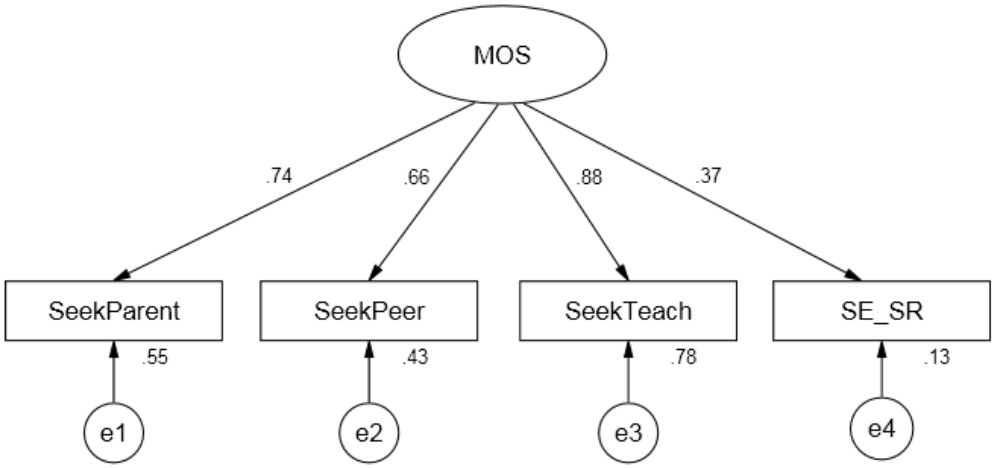

Figure 4. Final measurement model for MOS = mobilization of support. All factor loadings are significant, $p < .001$. Variances are not drawn.

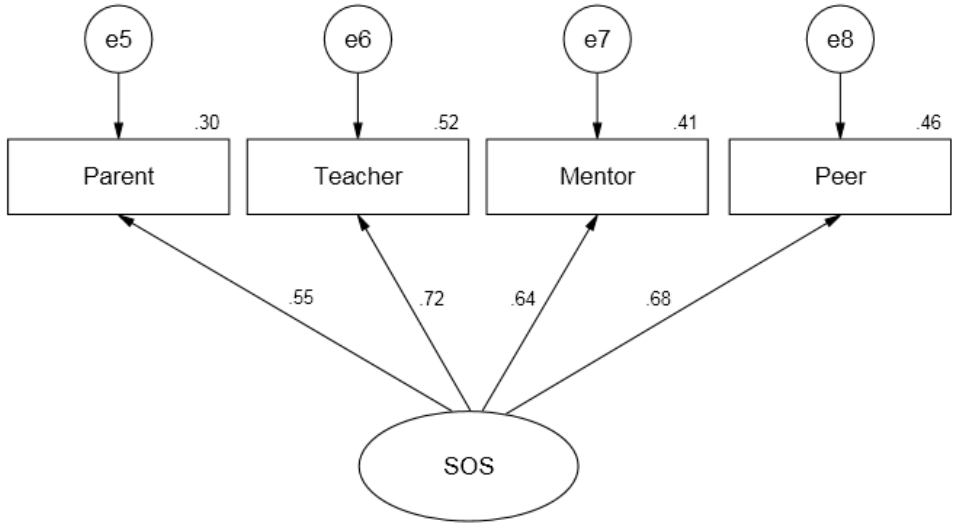

Figure 5. Final measurement model for SOS = social support. All factor loadings are significant, $p < .001$. Variances are not drawn.

CHAPTER IV

RESULTS

Do students with disabilities actively mobilize support to meet their needs, or is their success facilitated by existing structures at home, in school, and in communities? This study addressed these questions by examining the direct and indirect relationships between MOS and SOS on four outcomes: academic, behavioral, emotional, and career. Data analyses in this section progress in three stages. First, I examine the descriptive statistics of the predictor and outcome variables. Second, I perform SEM to examine the model fit and to test the posited meditational paths. Finally, I use multi-group analyses to test for invariance in the full model across subgroups of sex, race/ethnicity, disability, and grade level.

Descriptive Statistics

Correlations. Correlations among study variables are displayed in Table 9. All four MOS variables were correlated significantly with emotional outcomes, three were associated with career outcomes, and two were associated with behavioral outcomes. None of the MOS variables were correlated significantly with academic outcomes. Also shown in Table 9, all four SOS variables were significantly associated with emotional and career outcomes, and only the mentor and peer SOS factors were correlated with the behavioral outcome. None were correlated significantly with academic outcomes.

Means and standard deviations. Table 10 summarizes means and standard deviations for all variables across sex, race/ethnicity, disability, and grade level.

Table 9

Zero-Order Correlations Among the Study Variables (N = 206)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Seek parent		.48**	.66**	.30**	.59**	.39**	.39**	.39**	.01	-.12	.36**	.30**
2. Seek peer			.58**	.25**	.31**	.25**	.27**	.28**	.06	-.22**	.17*	.12
3. Seek teacher				.31**	.40**	.51**	.32**	.43**	.11	-.15*	.35**	.25**
4. SE_SR					.26**	.36**	.36**	.26**	.10	-.11	.35**	.33**
5. Parent						.41**	.36**	.34**	.06	-.06	.33**	.26**
6. Teacher							.44**	.49**	.07	-.12	.37**	.21**
7. Mentor								.45**	-.03	-.19**	.42**	.38**
8. Peer									.02	-.18**	.40**	.24**
9. Academic										-.15*	.11	.04
10. Behavioral											-.12	-.08
11. Emotional												.34**
12. Career												
M	3.06	3.06	2.80	2.95	2.67	2.63	3.65	3.36	2.46	1.46	5.33	3.34
SD	1.14	1.09	0.99	0.54	0.57	0.64	0.70	0.76	0.72	0.41	1.06	0.48
Min.	1.00	1.00	1.00	1.00	1.00	1.15	1.25	1.00	0.50	1.00	1.67	2.00
Max.	5.00	5.00	5.00	4.00	4.00	4.00	5.00	5.00	3.95	2.97	7.00	4.00

Note. Seek = help-seeking behaviors; SE_SR = Self-Efficacy for Enlisting Social Resources; Parent = Inventory of Parent Attachment; Teacher = Inventory of Teacher-Student Relationship; Mentor = Influence of Others on Academic and Career Decisions; Peer = Peer Connectedness. *M* = mean, *SD* = standard deviation. **p* < .05, ***p* < .01.

Table 10

Mean and Standard Deviation of Measured Variables By Groups (Sample Size)

	Sex				Race/Ethnicity				Disability (incidence)				Grade level			
	Boy (n = 132)		Girl (n = 74)		White (n = 115)		Non-White (n = 91)		LD (n = 150)		All Others (n = 56)		9-10 (n = 98)		11-12 (n = 108)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
SeekParent	2.96	1.14	3.23	1.12	3.07	1.12	3.04	1.17	3.13	1.14	2.86	1.13	3.10	1.10	3.01	1.18
SeekPeer	2.92	1.12	3.32	1.00	3.02	1.09	3.12	1.10	3.21	1.03	2.68	1.17	3.00	1.09	3.12	1.10
SeekTeach	2.78	0.98	2.82	1.01	2.84	0.95	2.74	1.03	2.84	0.98	2.69	1.02	2.76	1.00	2.83	0.98
SE_SR	2.92	0.54	3.00	0.56	2.98	0.49	2.91	0.61	2.96	0.55	2.93	0.53	2.91	0.53	2.98	0.56
Parent	2.67	0.61	2.67	0.51	2.69	0.60	2.65	0.54	2.68	0.52	2.66	0.70	2.70	0.55	2.64	0.59
Teacher	2.69	0.64	2.52	0.62	2.69	0.65	2.55	0.61	2.62	0.62	2.65	0.68	2.59	0.64	2.66	0.64
Mentor	3.57	0.70	3.79	0.69	3.65	0.67	3.65	0.74	3.69	0.71	3.53	0.68	3.68	0.73	3.62	0.68
Peer	3.35	0.75	3.36	0.79	3.33	0.75	3.38	0.78	3.39	0.77	3.26	0.74	3.40	0.74	3.32	0.79
Academic	2.36	0.76	2.63	0.63	2.52	0.68	2.39	0.77	2.44	0.66	2.52	0.88	2.52	0.82	2.40	0.62
Behavioral	1.55	0.43	1.29	0.30	1.45	0.36	1.46	0.46	1.34	0.33	1.77	0.43	1.46	0.44	1.45	0.38
Emotional	5.38	0.99	5.23	1.18	5.31	1.05	5.35	1.08	5.43	0.99	5.05	1.21	5.40	1.09	5.26	1.04
Career	3.33	0.48	3.36	0.49	3.34	0.50	3.34	0.46	3.32	0.46	3.38	0.54	3.35	0.46	3.33	0.50

Note. Seek = help-seeking behaviors; SE_SR = Self-Efficacy for Enlisting Social Resources; Parent = Inventory of Parent Attachment; Teacher = Inventory of Teacher-Student Relationship; Mentor = Influence of Others on Academic and Career Decisions; Peer = Peer Connectedness. LD = Learning Disabilities. *M* = mean, *SD* = standard deviation.

Sample sizes for subgroups are displayed in Table 10. Distributions of all measured variables' scores approximated normal. No significant univariate outliers were detected. Behavioral scores' distribution was positively skewed, and the emotional scores' distribution was negatively skewed.

Structural Model

The final model (shown in Figure 6) had adequate fit, $\chi^2(49) = 121.28$, $p < .001$, CFI = .90, SRMR = .06, RMSEA = .08. As shown in Figure 6, all indicators loaded significantly onto their associated latent constructs (MOS and SOS), which supported the operationalization of MOS and SOS in the final model.

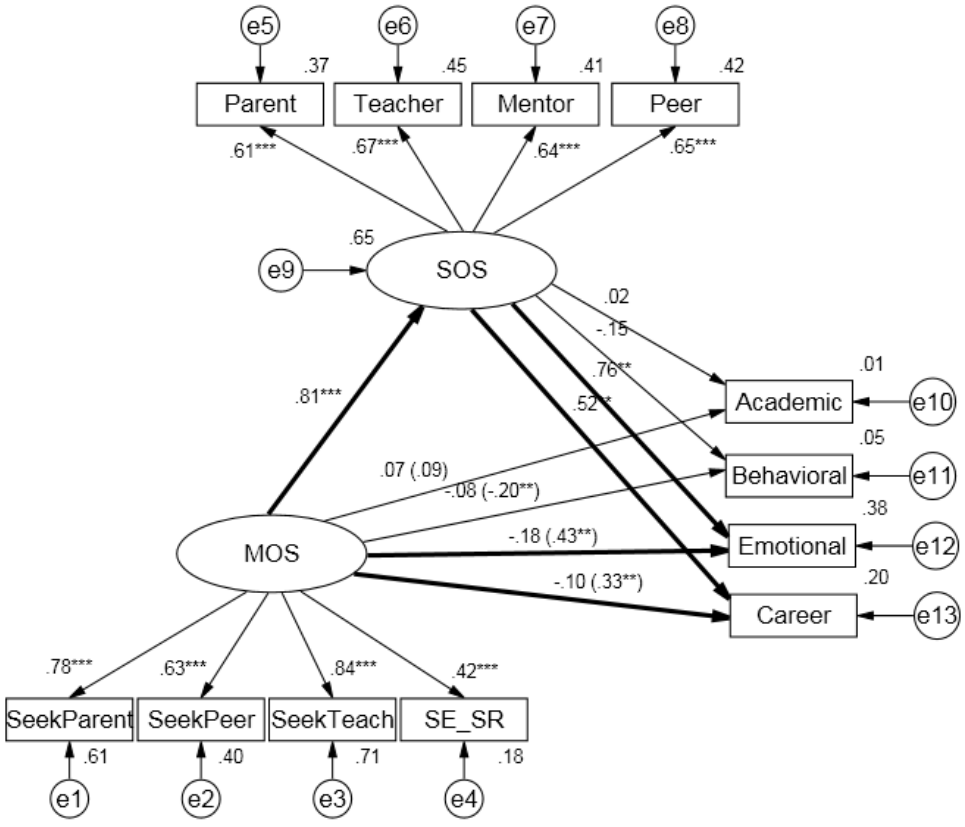

Figure 6. SEM results. The values along the arrows are the standardized regression coefficients (ß); the values by the corners of the rectangles are the squared multiple correlations (R^2). (Total effects).

The magnitude of the loadings of indicators on the latent construct MOS varied across support sources, where students' help-seeking behaviors towards teachers formed the strongest indicator of MOS (*ß* = 0.84) followed by their help-seeking behaviors towards parents (*ß* = 0.78), then peers (*ß* = 0.63). The magnitude of the loadings of indicators on the latent construct SOS remained relatively stable across support sources, with *ßs* ranging from 0.61 for parent support to 0.67 for teacher support.

Mediation analyses. Mediation analyses were tested using the bootstrap method with bias-corrected confidence estimates. The 95% confidence intervals of indirect effects were obtained with 1000 bootstrap resamples (Preacher & Hayes, 2008).

Table 11

Standardized Indirect, Direct, and Total Effects

Effect	MOS	SOS
Indirect		
SOS		
Academic	0.03	
Behavioral	-0.15	
Emotional	0.60**	
Career	0.43*	
Direct		
SOS	0.81**	
Academic	0.06	0.03
Behavioral	-0.03	-0.19
Emotional	-0.17	0.75**
Career	-0.10	0.53*
Total		
SOS	0.81**	
Academic	0.09	0.03
Behavioral	-0.18*	-0.19
Emotional	0.43**	0.75**
Career	0.32**	0.53*

*$p < .05$, **$p < .01$, ***$p < .001$.

To recap, Baron and Kenny's (1986) criteria for determining the presence of a mediator are: (a) the direct effect of the IV on the presumed mediator is significant (path

a), (b) the direct effect of the presumed mediator on the DV is significant (path *b*), and (c) when paths *a* and *b* are controlled, the previously significant relation between the IV and the DV (path *c* or the total effect) is reduced (path *c'* or the direct effect). Standardized indirect, direct, and total effects are displayed in Table 11.

Path coefficients in Figure 6 show that: (a) MOS had a direct positive relationship with SOS (path *a*), (b) SOS had direct positive relationships with emotional and career outcomes, after partialling out the effect of MOS (path *b*), and (c) total effects of MOS on emotional and career outcomes were significant (path *c*) but not its direct effects (path *c'*). These results indicated that SOS mediated the link between MOS and emotional outcomes, *ß* = 0.60, 95% CI [0.33, 2.23], and the link between MOS and career outcome expectations, *ß* = 0.43, 95% CI [0.13, 1.15]. Overall, the variables in MOS and SOS explained approximately 38% and 20% of the variances in emotional and career outcomes, respectively. The direct effect of MOS on emotional and career outcomes also became non-significant when controlling for SOS (path *c'*), thus suggesting full mediation (see Figure 6). Notice that the total effect of MOS on behavioral outcomes was significant, but became non-significant after controlling for SOS (direct effect), thus suggesting the presence of multicollinearity among MOS and SOS variables.

Invariance Testing

Given that two significant mediational paths were established, a multigroup analysis (factorial invariance) was used to compare subgroup differences of the two significant mediated models (emotional and career) across four categories: sex (boys and girls), race/ethnicity (whites and minorities), disabilities (LD and all others), and grade level (9-10 and 11-12). The default option for invariance testing in Amos was used. The

chi-square from the unconstrained model (all parameters allowed to be unequal across groups) was compared to the chi-square from the constrained model (factor loadings were constrained to be equal across groups). The mediated paths appeared to be invariant (equal weights) across race/ethnicity ($\Delta\chi^2(15) = 13.60$, $p = .556$), disability ($\Delta\chi^2(15) = 13.60$, $p = .556$), and grade level (($\Delta\chi^2(15) = 13.60$, $p = .556$). Model differences (not invariant) were detected for sex, $\Delta\chi^2(15) = 28.73$, $p = .02$. As shown in Table 12, indirect effects of SOS on the links between MOS and career and MOS and emotional outcomes were significant for boys, but not for girls. SOS fully mediated the relationships between MOS and those two outcomes for boys. Fit indices for both the unconstrained model ($p < .001$, CFI = .88, SRMR = .07, RMSEA = .07) and constrained model ($p < .001$, CFI = .86, SRMR = .08, RMSEA = .07) for sex demonstrated poor to adequate fit. Extreme caution is warranted when comparing these results due to the lack of good fit and lack of cross-validation. Standardized parameter estimates are displayed in Figures 7 and 8.

Table 12

Standardized Parameter Estimates for Boys and Girls (Unconstrained Model)

	Boys (n = 132)		Girls (n = 74)	
Effect	MOS	SOS	MOS	SOS
Indirect				
SOS				
Emotional	.64**		.42	
Career	.51**		.34	
Direct				
SOS	.78**		.89**	
Emotional	-.31	.82**	.24	.47
Career	-.17	.65**	.04	.38
Total				
SOS	.78**		.89**	
Emotional	.32**	.82**	.66**	.47
Career	.34**	.65**	.31	.38

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

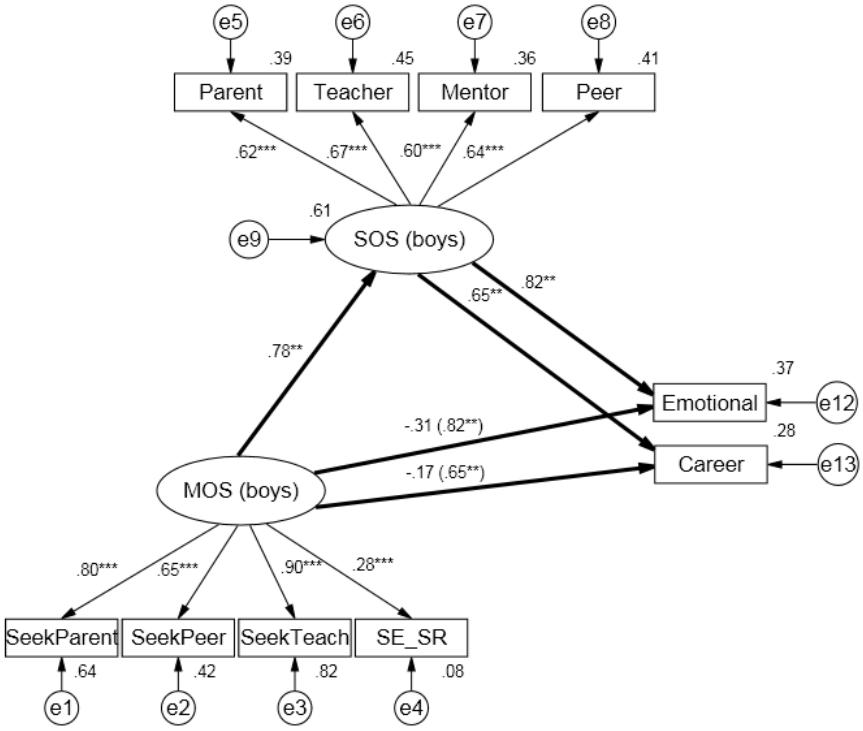

Figure 7. The unconstrained model for boys. **$p < .01$.

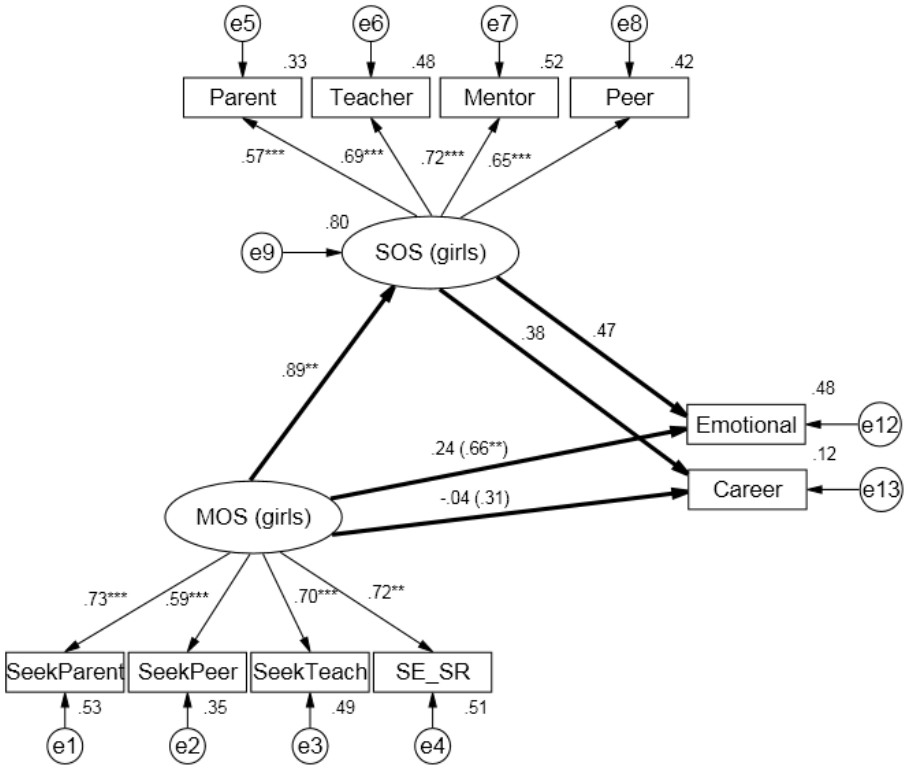

Figure 8. The unconstrained model for girls. **$p < .01$.

CHAPTER V

DISCUSSION

The purpose of the present study was to test a model of social capital among high school students with disabilities. Social capital was conceptualized as consisting of MOS (i.e., agency in recruiting social capital) and SOS (i.e., salient social support and environmental structures). Of primary interest in the present study was to investigate the relationship between MOS, SOS, and academic, behavioral, emotional, and career outcomes as well as whether or not SOS mediated effects of MOS on outcomes. Of secondary interest was to explore group differences across sex, race/ethnicity, disability, and grade level on the significant mediated paths.

Results from a sample of 206 youth with disabilities from 16 classrooms, across nine high schools, six districts, and three states indicated that: (a) MOS was directly related to three of the four outcomes (behavioral, emotional, and career), (b) SOS was directly related to two of the four outcomes (emotional and career), (c) SOS mediated effects of MOS on two of the four outcomes (emotional and career), and (d) these two mediated paths were significant for boys but not for girls. Thus, findings support the hypotheses that students' abilities to mobilize support from parents, peers, teachers, and mentors were significantly related to the quality of their social support network, which in turn, enhanced their emotional well-being and career outcome expectations, but not their academic or behavioral performance in the classroom. However, these significant mediated relationships only apply to boys but not to girls with disabilities in high school. Before elaborating on primary findings and their implications for research and practice, I will discuss results from the measurement models first.

Results From Measurement Models

Prior research suggests that it is important to carefully construct measurement models prior to conducting SEM (Jackson et al., 2009; Schreiber et al., 2006; Thompson, 2004). In the current study, I conducted a series of CFAs to ensure that measurement models had good fit to the data prior to testing the structural model. These analyses resulted in several important changes between the hypothesized models and the final measurement models.

First, MOS was initially hypothesized to include three components: (a) students' attitudes towards accepting help from others (network orientation), (b) self-efficacy for enlisting social support, and (c) help-seeking behaviors. Factor loadings from the initial CFA revealed that help-seeking behaviors had the strongest linear relationships with MOS, followed by self-efficacy for enlisting support. Network orientation was not a significant factor of MOS. In other words, students' help-seeking behaviors and self-efficacy for enlisting support, not their attitudes about accepting help from others, were predictive of their abilities to mobilize support from parents, teachers, and peers.

The finding that network orientation did not load significantly on MOS was unexpected and should be interpreted with caution. First, what I considered to be MOS in this study could just be one dimension of actual mobilization of support. Given that this study is an exploratory correlational study, additional research is needed to explore the underlying factors of this construct. Second, adolescent network orientation has been treated as a homogenous construct (Barone, Iscoe, Trickett, & Schmid, 1998; Vaux et al., 1986). However, Barone et al. (1998) found that adolescent network orientation differs as a function of network reference groups (family, non-family adults, and peers). They

created a three-factor network orientation scale that distinguished between different network reference groups and found adequate fit on two samples of high school students with and without disabilities in a diverse-urban school district. Unfortunately, their measure could not be found. All four researchers became practitioners. I was able to contact the second author at her private practice, but she no longer had a copy of that measure. The measure of network orientation used in the present study did not distinguish among various network reference groups. Future research on adolescents with disabilities should re-examine this construct and consider the importance of distinguishing among network orientations towards family, non-family adults, and peers.

Factor loadings revealed that help-seeking behaviors towards teachers had the strongest relationship with MOS, followed by parents, then peers. This finding supports prior research that found teacher-student relationships to be one of the most important school factors influencing school-related outcomes (Croninger & Lee, 2001; Pil & Leana, 2009; Woolley & Bowen, 2007). However, additional studies are warranted to determine if teacher-student relationships contribute more to school-related outcomes than parent-child relationships and peer relationships for high school students with disabilities.

I originally proposed that SOS was comprised of both positive and negative relationships with parents, siblings, friends, teachers, mentors, peers, schools, and neighborhoods. The alienation factors on the parent, friend, and teacher scales were not significantly associated with SOS. The non-significance of the alienation factors was unexpected, because both Bourdieu (1986) and feminist theorists (Adkins, 2005) have proposed that social capital can be negative. Although these negative social capital

indicators are not appropriate for this model, a model that captures effects of negative social capital is a worthy endeavor for future investigations.

Another unexpected result was the low factor loadings of friend support compared to peer support measures. While this finding validates the original hypothesis that friendships and peer relationships are not analogous constructs, this difference could result from multicollinearity between the friend support and the peer support measures. Unfortunately, the literature on friendships and peer relationships has not made a clear distinction between the two groups, thus, does not offer any explanation for this finding. Therefore, I will treat the peer support factor as indicative of both friendships and peer relationships for the remainder of this discussion. Future research should consider distinguishing between friendship (defined by proximity and intimacy) and acquaintance groups to determine whether and why these types of relationships have different impacts on students' school-related outcomes.

Another surprising finding was that teacher support had the strongest relationship with SOS, followed by peer, then mentor, and lastly parent. These results suggest that relationships with individuals outside of the family (teachers, peers, mentors) had a stronger influence on students with disabilities' social support network than relationships with those at home. These findings are inconsistent with prior research that found adolescents' relationships with parents have a strong influence on their social interactions (Brown, Mounts, Lamborn, & Steinberg, 1993; Cicchetti et al., 1995; Steinberg & Morris, 2001). For example, Panacek and Dunlap (2003) found that students with disabilities identified family members to be the most important people in their lives, followed by home-based friends, then school-based friends. Research on adolescents

without disabilities also found that those without close friends, and those with authoritative parents are more influenced by family than peer relationships (Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Gauze, Bukowski, Aquan-Assee, & Sippola, 1996). Additional research is needed to determine if findings from this study would repeat with a different sample of students with disabilities. Lastly, the sibling variable was dropped due to a large number of single-child participants. Future research is needed to examine effects of sibling support.

Third, the four outcomes (academic, behavioral, emotional, and career) were initially hypothesized to load on one latent construct (outcome). Although this initial model had good fit to the data, none of the factor loadings were significant, suggesting that the latent construct did not explain any of the outcomes. This result is consistent with other investigations in the social capital literature, where each outcome was tested separately (i.e., Ahmed, Minnaert, van der Werf, & Kuyper, 2010; Freeman & Condron, 2011; Ream & Palardy, 2008). Thus, in the current study, relationships between MOS, SOS, and each of the four outcomes were treated independently.

Results from the Structural Model

MOS was strongly related to SOS and three outcomes: behavioral, emotional, and career. This finding is consistent with the hypothesis that students with high mobilization skills were likely to acquire a significant social support network and achieve positive outcomes. Specifically, high MOS skills were associated with decreasing problem behaviors, increasing emotional well-being, and optimistic career outcome expectations. However, the significant relationship between MOS and problem behaviors disappeared when controlled for SOS, thus suggesting a significant degree of redundancy in using

both measures to assess students' behavioral outcomes. SOS was also significantly related to emotional and career outcomes, but not academic and behavioral outcomes.

The non-significant relationship between MOS and academic outcome is inconsistent with existing research in the social capital literature. Two explanations are offered. First, I did not use an academic self-efficacy measure. Studies of the relationship between self-efficacy and academic performance found that self-efficacy accounts for a quarter of the variance in academic performance (Pajares, 2006). However, those studies used specific dimensions of self-efficacy, such as writing self-efficacy (Pajares, 2003) and mathematics self-efficacy (Pajares, 2005). This study used the self-efficacy for enlisting social resources subscale, which significantly predicted SOS but not the academic outcome.

Second, in the special education literature, researchers found that self-determination interventions were not effective in improving the academic performance of students with disabilities. The self-determination construct in special education resembles, but is not analogous to, the MOS construct in this study. Cobb, Lehmann, Newman-Gonchar, and Alwell (2009) reviewed six meta-analyses of self-determination studies and concluded that, "If academic achievement enhancement for students with disabilities is what local practitioners are looking for… then it appears that they should look elsewhere than at self-determination" (p. 113). Perhaps the same conclusion could be made about MOS in this study. However, in the absence of experimental control, this conclusion is premature.

The non-significant relationship between SOS and the academic outcome could be due to the inclusion of late adolescents in the sample. Kao and Rutherford (2007)

found that parent-school involvement was positively related to GPA and standardized test scores for a national sample of students in grade 8 but not for students in grade 12. The researchers concluded that social capital mattered most for younger students. Kao and Rutherford (2007) also used parents' responses to four items about their involvement at school from NELS:88 as a measure of parent social capital. Perhaps the assessment of SOS in this study, which was based on students' perceptions of support, might not be indicative of actual resources that individuals in a student's social support network possess or actions that those individuals would take on behalf of the student.

The non-significant relationship between SOS and behavioral outcomes was inconsistent with the literature reviewed. Research in the field of developmental science has shown that social support is a strong predictor of positive behavioral development (Eccles & Roeser, 2009; Lerner et al., 2009; Montague et al., 2010). However, research also shows that students' perceptions of support diminished as they advanced through middle and high schools (Barber & Olsen, 2004; De Wit et al., 2011). Cross-validation of this model with a younger sample of students with disabilities would clarify the significance, or lack thereof, of the link between SOS and behavioral outcomes.

Results from Invariance Testing

The literature reviewed in this study suggests that there were sex, race/ethnicity, and grade level differences in adolescents' social capital. Therefore, I conducted follow-up comparisons of these group differences on the two significant mediated paths (emotional and career). I also tested for model invariance on students' disabilities (LD and all other) to examine potential differences between these two groups. This step was

entirely exploratory and results should be interpreted with extreme caution due to the lack of good fit and the lack of cross-validation with a different sample.

Contrary to prior research, results from these analyses indicated that the mediated paths between MOS, SOS, and emotional and career outcomes were invariant for race/ethnicity, disability, and grade level. The lack of racial/ethnic, disability, and grade level differences in this study's model may be explained in several ways, each of which requires further investigation. The significant difference across sex is discussed last.

Race/Ethnicity. Contrary to previous studies indicating that non-white students have less access to social capital than white students, data from this study did not reveal a difference between white and non-white students (black, mixed, Latino, Native American, and Asian American). What is unclear is whether the lack of an observed racial/ethnic difference in this study's model represents equal levels of MOS and SOS for all students in the sample or masks a true difference accounted for by the influence of sex or disability. In other words, perhaps sex and disability, more than race/ethnicity, influence students' abilities to mobilize support and the structural barriers that prevent them from acquiring social support. Additional research is needed to assess if race/ethnicity play a negligible role in social capital formation after controlling for sex and disability.

Disability. One possible explanation for the lack of disability differences may be that the sample in this study is not heterogeneous enough. First, students with LD comprised 73% of the sample. Second, all students must be able to read at least at the fourth grade level in order to participate in this study, so the sample in this study might have been cognitively equivalent even though their disability labels were not. A larger

and more balanced sample size of students with LD and all other disabilities is needed to validate this finding.

Although this study found no significant differences among students with LD and all other disabilities, it does not discount prior research showing significant differences in the social capital of students with and without disabilities. Barone, Schmid, Leone, and Trickett (1990) found that students with disabilities reported that non-family adults made up 38% of people in their social network from whom they would seek emotional support compared to 10% reported by students without disabilities. Panacek and Dunlap (2003) found that students with emotional behavioral disorders had very restricted social networks in school, which were dominated by peers and adults affiliated with special education, relative to a matched comparison group in general education. Findings from the present study and prior research underscore the importance of attending to both the individual factors (students' ability to recruit support from different sources) and environmental factors (availability of support in different contexts) in supporting students with disabilities to develop social capital.

Grade level. Grade level differences were expected based on school experience and maturation. Specifically, students with disabilities in grades 11 and 12 were expected to display higher levels of emotional maturity, social adaptation, self-actualization, and career confidence than students in grades 9 and 10. Most studies of differences across grade levels focused on elementary and middle school students (e.g., Roeser, Eccles, & Sameroff, 2000), and detected significant changes in students' perceptions of self-esteem, self-confidence in mathematics, reading, and social activities (Wigfield, Eccles, MacIver,

Reuman, & Midgley, 1991). Similar patterns of differences across grade levels were expected of students in high school.

Contrary to expectations, results from this study did not reveal any significant differences among students in grades 9 through 12. Interpretation of this finding should take into account past research that found grade level effects to be nonlinear. For example, Martin (2009) assessed age effects in a sample of 3,684 high school students and found no significant *linear* age effects on students' academic performance and engagement, but did find significant *nonlinear* age effects (cubic and quadratic).

Sex. Prior research has shown sex differences in the utilization of support from family members and peers across the lifespan, where pre and early adolescent girls (Bukowski et al., 1994), late adolescent girls (Vaux, 1985), and adult women (Day & Livingston, 2003) reported greater utilization of support from family members and peers than did adolescent boys and adult men. Research in the special education literature has also shown that girls who used family members and peers to find jobs were 3.77 times more likely to be competitively employed versus 2.33 times for boys. These findings indicate that not only do girls have a more supportive social support network than boys, but also those support networks are more effective at influencing outcomes for girls than for boys. Results from the present study did not affirm these prior findings of sex differences favoring girls, because the mediated paths were significant for boys but not for girls. However, it is difficult to conclude that boys in this study had stronger MOS skills or a more supportive SOS network than girls. As such, careful considerations of this finding are pivotal. Two explanations are offered.

First, Powell and Luzzo (1998) sampled 235 students (125 girls, 127 boys) in grades 10, 11, and 12 from four urban high schools and found that boys believed that they had more control over their career decision-making than did girls. Career decision-making represents the cognitive dimension of career maturity (Crites, 1971). Those who possess high levels of career maturity are more likely to think about alternative careers, relate present behaviors to future goals, set achievable occupational aspirations and expectations, and have greater internal locus of control (Luzzo, 1995; Powell & Luzzo, 1998). Perhaps boys' sense of control and self-efficacy of career decision-making is linked to goal-oriented actions that lead to optimistic career outcome expectations and overall emotional well-being.

Second, prior research has shown that patterns of social interactions are different for boys and girls. For example, there is sufficient evidence showing that boys, from pre-school age to adolescence, have more integrated social networks (their friends were more likely to be friends with one another) than girls (Rose, 2002). Boys' pattern of social interaction is more consistent with Bourdieu's (1986) definition of social capital (i.e., "aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships"). Sex differences in patterns of social interactions might have accounted for the observed sex differences in this study. Future studies should take into account different structural patterns (frequency, duration, and content of interactions) of social interaction between boys and girls with disabilities. Finally, sex differences found in this study should be interpreted with caution, because the invariance test was conducted with a severely limited sample size (boys = 132, girls = 74), thus violating the $N = 200$ rule-of-thumb in SEM.

Implications for Research

At present, three conceptual confusions exist in the social capital literature: (a) the distinction between actual and potential resources, (b) the difference between social capital and the process of capital formation, and (c) the distinction between the network orientation of resource-seekers and willingness of resource-givers (Lee, 2010). Findings from the present study contribute to improving social capital research in education by helping to clarify two of these conceptual confusions.

First, findings from this study support the notion that potential resources should be treated as "accessible but un-utilized sources of social capital" (Lee, 2010, p. 781). Although it is unclear from this study if students actually utilized resources from their network reference groups to attain positive emotional and career outcomes, the significant effects of SOS on these outcomes are consistent with network analysts' conception of social capital as resources purposively mobilized from social relations. The significant indirect effects lend evidence to support the claim that potential resources can be activated (via MOS), at some point, to become actual resources (via SOS).

Second, the process of capital formation (MOS) is and should be treated differently from actual social capital (SOS). Portes (1998) proposes the separation of social capital resources from an individual's ability to obtain them. He cautions against the growing consensus in the literature that "social capital stands for the ability of actors to secure benefits" (p. 6) Evidence from this study concurs with Portes' suggestion to separate one's ability in forming social capital (MOS) from social capital itself (SOS). MOS depends on individual students' social skills, ability, and motivation. Students may have mobilization skills to acquire support but may lack access to a positive support

network, perhaps due to living in resource-deprived environments. On the other hand, students may have access to successful parents, mentors, peers, and teachers but lack the ability or motivation to utilize these resources.

Finally, although this study did not measure the willingness of resource-givers to support students (resource-seekers), it did provide some distinctions among various network reference groups. Specifically, findings from this study revealed that teachers had the strongest influence on students' MOS and SOS, while parents contributed the least to forming students' SOS. Future research should consider investigating not only the willingness of resource-givers, but also their abilities to provide important support.

Experimental and longitudinal studies are necessary to provide the requisite degree of analytical validity of distinctions between (a) actual and potential resources, (b) social capital and the process of capital formation, and (c) the willingness of resource-seekers and resource-givers. Only when we can observe the transformation of potential resources into actual resources, and the willingness of resource-givers to take the desired actions at a future time can these distinctions be made clear. This investigation is beyond the scope of this study, but should be considered in future research.

Implications for Practice

Adults working with students with disabilities also assume the role of resource-givers, and thus, should be aware that students' social capital is simultaneously influenced by their ability to mobilize support and by resource-givers' ability to provide the necessary support. This understanding has significant implications for students' overall emotional well-being and career outcome expectations.

Importance of emotional well-being. The significant effects of MOS and SOS on emotional outcomes are consistent with Deci and Ryan's work in the field of motivational psychology. Deci and Ryan (2000) claim that relatedness, autonomy, and competence are "innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being" (p. 229). Relatedness, similar to the construct of SOS in this study, refers to secure connections with others. Autonomy (self-initiation) and competence (self-efficacy in acquiring various internal and external outcomes) are partially accounted for in the MOS model. The satisfaction of these basic needs is pivotal for human development, but that satisfaction requires both an individual's motivation to act and a supportive social environment to respond. For practitioners interested in the promotion of positive outcomes for students with disabilities, the implications are clear: teaching students mobilization skills and providing training for parents, mentors, and teachers to champion students' growth are essential to depositing these basic psychological nutrients into the lives of youth with disabilities.

Examination of items on measures of MOS and SOS revealed the following recommendations for students and adults. Students need to (a) share their academic and career goals with family and non-family members, (b) identify specific individuals who can support their academic and career goals, (c) seek out mentors and role models in the community, (d) talk to friends about academic and career goals, and (e) let go of negative relationships. Parents, teachers, and mentors need to (a) accept students for who they are, (b) create opportunities for students to practice mobilization skills, (c) talk to students about academic and career aspirations, (d) be available to students, and (e) help students to troubleshoot problems in school and in life.

Importance of career outcome expectations. The findings that MOS and SOS significantly predict career outcome expectations were consistent with prior research. Research in the field of career counseling found that support from parents, peers, and teachers significantly predict career aspirations, perceptions of opportunity and school outcomes, perceptions of barriers, and self-efficacy for adolescents (Ali, McWhirter, & Chronister, 2005; Kenny, Blustein, Chaves, Grossman, & Gallagher, 2003; Wall, Covell, & MacIntyre, 1999). The significant relationships of MOS and SOS with career outcome expectations are particularly important for students with disabilities. Research in the field of career counseling found that youth who are vulnerable to discrimination face a range of systemic career/education barriers that inhibit their career trajectories, such as negative social support and role models, lack of access to resources, negative self-efficacy, and limited coping strategies (Jackson & Nutini, 2002). The literature in special education indicates that students with disabilities are more likely to be underemployed than those without disabilities; if employed, they are more likely to work in secondary labor market positions with few employment benefits than those without disabilities (Newman et al., 2009). Prior research has also shown that students with disabilities who had high occupational guidance and preparation from teachers were more likely to have a higher quality of life and to be employed after high school (Roessler et al., 1990).

Research in the field of vocational psychology found that career expectations during adolescence reflect students' projections of occupational self-identity into adulthood (Diemer, 2009, 2012). For example, Arbona (2000) found that positive career outcome development during adolescence significantly impact lifestyle choices and general well-being in adulthood. When students lack resources or support to achieve their

occupational self-identity, they are more likely to lower their vocational expectations and end up pursuing careers that are easier to attain. The destructive nature of this aspiration-expectation gap can result in diminishing career attainment and long-term quality of life for students with disabilities.

The career development of youth vulnerable to discrimination can be enhanced through positive social support, career intervention programs, and effective coping strategies (Jackson & Nutini, 2002). Jackson and Nutini (2002) also suggest that both the students and those who work with them need to learn about the hidden resources and barriers that continue to limit the achievement of students with disabilities. Prevention efforts can focus on teaching students important social skills to recruit support and to build a dense social network of actual support. Students with disabilities need to be taught how to initiate positive relationships with key individuals who can support them in attaining their goals, thereby improving their long-term quality of life. Prevention efforts can also focus on training parents, teachers, and mentors on how to support students. Supportive peers and adults can facilitate students' orientation and motivation towards improving their circumstances.

Limitations

This study suffers from the following limitations. First, no causal relations can be inferred. SEM is sometimes referred to as a causal modeling technique, which is both dated and erroneous (Kline, 2011). No statistical techniques, no matter how sophisticated, can provide evidence of causality in the absence of experimental control (Kline, 2011). Future research should test this model on experimental or longitudinal data, where outcome variables are collected after the predictors.

Second, this study used only self-report measures to collect indicators of social capital, which is prone to response distortions due to an individual's psychological, sociological, linguistic, experiential, and contextual variables that may have little to do with the constructs of interest (Lanyon & Goodstein, 1997). Observation studies could address some of these issues. Future research should also consider direct observations and collecting multi-source data (from parents, peers, and mentors). Third, the lack of cross-validation is a significant concern. Ideally, a large sample size should have been obtained to allow for cross-validation, where the data would have been split in half and be used to determine if the measurement and structural components would display similar patterns on both sub-samples.

Finally, I was not able to capture actual resources available to students from individuals in their social support network (parents, teachers, mentors, peers) and these individuals' willingness to support students. If these resource-givers were willing but lacked the means to provide appropriate capital, then the mobilized support might not generate desired outcomes. Future research should consider examining these factors.

Conclusions

Students with disabilities remained a neglected population in social capital research. They are also more at-risk for diminished academic and career outcomes than students without disabilities. Understanding specific mechanisms that can support their growth is essential. Findings from this study revealed that the emotional well-being and career outcome expectations of high school students with disabilities could be enhanced through supportive relationships with parents, peers, teachers, and mentors, as well as social skill and self-efficacy development. Emotional well-being is related to the

satisfaction of three innate psychological needs that are pivotal for human growth: autonomy, relatedness, and competence. Career outcome expectations are indicative of students' vocational aspirations and success in adulthood.

To date, MOS has not been proposed as a potential explanatory variable in the social capital literature. Additionally, MOS and SOS variables have not yet been tested together with a sample of students with disabilities. This study supports the importance of examining student-level factors in future research of social capital in educational context.

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