EGOCENTRIC NETWORKS OF ADOLESCENTS WITH AND WITHOUT DISABILITIES ACROSS ACADEMIC TRACKS: CONDITIONS AND IMPACT ON COMMUNICATION TECHNOLOGY USE AND FORMAL AND INFORMAL SOCIAL ACTIVITY

BY

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DISsertation

Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Special Education in the Graduate College of the University of Illinois at Urbana-Champaign, 2014

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ABSTRACT

Limited research has examined how personal characteristics and institutional policies influence adolescent social networks and engagement in informal and formal social activity. To examine these issues, a social capital model was developed and tested to examine how personal characteristics (i.e., gender, race/ethnicity, grade, crowd membership, and information communication technology use - ICT) and institutional policies, such as school-based academic tracking based on disability status, influence the social networks of adolescents with and without disabilities and their formal and informal social network activities. Ego network data were gathered on adolescents with and without disabilities in two high schools across academic tracks adopted by the schools (i.e., general education, co-taught, special education classrooms). Differences in ego network structural characteristics (i.e., network size, density, effective size, and efficiency) across academics tracks and the influence of personal characteristics on ego networks and social activity were examined. Results indicated significant differences in ego network structural characteristics, ICT use, and participation in informal social activity for students in the special education track. Implications for research and practice, including supporting the use of ICT and ego network mapping use during instruction are provided.
To my husband, Mitch, and my four beautiful children: Isaac, Moses, Helen, and Aaron.

I love you more than words can say.
ACKNOWLEDGEMENTS

I would like to thank the students and staff at both ‘Hinman’ and ‘Judson’ high schools. This study would not be possible without their enthusiasm and cooperation. The contact staff at both schools reinforced my belief that social networks matter, both for bonding and brokering social capital.

To Claire and Peter: Thank you for being the best students ever; for making me laugh, challenging me, and inspiring me to be a better teacher. I promise to teach future teachers all that you taught me: to listen to and communicate with all students, to have high expectations for all students, and to be creative in delivering instruction. You both reached every expectation in your own unique ways. It was a pleasure being your teacher.

To Megan and Rachel: Thank you to both of you for your dedicated preschool carpooling while I was three hours away in Champaign. Rachel, I could not have made it through my first two years and, this year Megan, you have been so helpful. Thank you.

To the faculty, staff, and students in the Department of Special Education: Thank you for providing unrelenting support, encouragement, and flexibility. I am so proud to have been a part of this Department. In particular, thank you to my cohort, Anne, Michelle, Lori, and Emily, who were my collective sounding boards over the last 5 years. I could not have gone through this without you.

To Andrea: I would not be here without you. So much has changed since our Harper days. I am grateful for your friendship and look forward to many more partnerships in this next phase of my career.

To my dissertation committee: Micki, thank you for your feedback and support through the program and, in particular, during the dissertation process. Your check-in emails always
arrived when I needed them most. Phil, thank you for providing me with honest and challenging feedback over these last 3 years. I have always enjoyed our banter and want you to know that you have made a significant impact on the way I think about social networks. Mike, thank you for jumping on the committee and for the helpful feedback you provided. I am truly grateful.

To Jim: Thank you for ‘taking the lead’ in guiding me through my first 2 years in the doctoral program. I appreciate your feedback and will always remember the advice you gave me about writing. I think I will always keep a Strunk and White (1918) book handy.

To Karrie: I really do not know how to thank you. You have been so supportive and encouraging, even in the most difficult of times. You are an amazing problem solver and, looking back, I am truly grateful for your energy and ability to make lists, timelines, and get things done. Thank you for spending so much time editing my work and encouraging me to think progressively about the supports I will provide to individuals with disabilities and special educators in this next phase of my career. I feel very prepared to partner with people with disabilities because of it. It has been an honor to work with such a smart and strong woman and scholar. Thank you.

To my family: Mom, Dad, ‘Dee’, and ‘Homer’ – thank you for supporting both Mitch and me through this unbelievable journey. We are truly grateful. Mitch, Isaac, Moses, Helen, and Aaron – you are my love. Thank you for your patience and support while I worked so many long hours. To the kids, thank you for making me play and laugh. Mitch, thank you for being a wonderful, caring, and patient father and husband. I love you all. Now … let’s go play some Legos©!
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Chapter 1

Introduction

Adolescents spend a majority of their waking hours participating in leisure activities; most of which are unstructured, either alone or with peers (Bartko & Eccles, 2003; Larson & Verma, 1999). Participating in social activities with peers is recognized as a valued life outcome (i.e., social inclusion and community participation; WHO, 2001). Adolescents who participate in structured social activities (either organized by school or another institution) experience a variety of social, emotional, physical, and intellectual benefits that help them feel recognized and connected to a group and deal with many different life challenges (Bartko & Eccles, 2003). However, researchers have found that students who are higher academic achievers, wealthier, and White typically participate in structured school-sponsored social activities more than their age peers. Students with disabilities, particularly those with the most significant support needs participate far less in such activities (King et al., 2006; 2009). These students also hang out with their friends during unstructured times less frequently than their age peers (Cadwallader & Wagner, 2003) and have few interactions with their peers beyond specifically scheduled opportunities (Carter, Hughes, Guth, & Copeland, 2005). Students with disabilities are isolated from peer social networks or are peripheral social network members (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Farmer, Stuart, Lorch, & Fields, 1993; Pearl, Farmer, Van Acker, Rodkin, Bost, … & Henley, 1998). Further, they tend to have smaller personal networks (i.e., ego networks) compared to their age peers (Kef, Hox, & Habekothe, 2000). These data suggest that adolescents with disabilities are at significant risk for isolation, loneliness, anti-social behavior and failing to reap the benefits of social activities (Eccles, Barber, Stone, & Hunt, 2003;
Farmer et al., 2011; Pearl, et al., 1998; Price & Dodge, 1989; Schaeffer et al., 2011; Williamson, McLeskey, Hoppey, & Rentz, 2006).

The benefits of social activity and connections should not be underestimated. Social connections are important resources for the individual because it is through connections with others that one can learn about opportunities, build relationships, and exchange resources. Theorists have coined the term social capital to describe the exchange of resources and information through social connections (Bourdieu, 1986; Coleman 1988; Putnam, 2000). Social capital is defined as a tool available to the individual that provides a particular benefit. Similar to the value physical capital (e.g., screwdriver) or human capital (e.g., college education) provides, social capital provides a direct benefit to the individual through the opportunities and information accessed (Putnam). The benefits of social capital, or the socially connected individual, can best be seen in the “well-connected individual in a well-connected community” (Putnam, p. 20). It is in these instances that individuals utilize their social relations and social connections to achieve (a) access to better education (Coleman); (b) employment opportunities (Johnson, 2011; Putnam); (c) health outcomes (Poortinga, 2006); (d) mental health (WHO, 2005) and (e) happiness (Cattell, 2001). Since harnessed social capital can create and sustain long-term benefits for the individual, creating and measuring social capital is important.

Social capital can be an elusive concept to measure. One way researchers have measured social capital is through social networks, which is the examination of the relational ties between a person and their friends. Network membership is assumed to reflect an individual’s connections and position in their community. Strengthening network ties provides better connections and increased opportunities for resources to flow between the individual and the members of their network.
While social networks are particularly important to adolescent development, not all adolescents experience and utilize networks with the same effectiveness. Although a variety of personal characteristics likely influence social networks, disability status is a factor that can significantly influence opportunities to build social networks. For example, adolescents with disabilities may not experience network benefits if their support needs for engagement in social activities are not addressed (e.g., social, communication, or behavior supports) or if they are not provided with opportunities to interact with and engage in network building with their age peers. Institutional factors within school systems, such as placement in segregated vs. integrated settings, extracurricular activities, and the “tracking” of students into these settings through school district policies can have a strong impact on these opportunities.

Schools that structure service delivery models, systems of supports, and opportunities for inclusion to build social connections and social capital for all members of the community have a greater likelihood of harnessing the benefits of social capital (Wellman & Leighton, 1979). However, limited research has examined how personal characteristics and institutional policies influence adolescent social networks and how those social networks impact valued life outcomes such as informal and formal social activity. To examine these issues, this study was designed to create and test a social capital model that describes how individual characteristics (i.e., gender, race/ethnicity, grade, crowd membership, and information communication technology use - ICT) and institutional policies (i.e., school-based academic tracking policies based on disability) impact the formation of social capital through social networks and social activities. The overall purpose of this study was examine the degree to which placement in differing academic tracks led to systematic differences in ego network characteristics and, as a result, engagement in informal and formal social activity of adolescents with and without disabilities.
To examine these issues, data were gathered on the ego networks of adolescents with and without disabilities in two high schools that served students in three defined academic tracks that differed in their level of inclusiveness (i.e., general education classroom placement, co-taught general/special education classroom placement; segregated special education classroom placement). Differences in adolescent structural ego network characteristics (i.e., size, density, effective size, and efficiency) across academic tracks were analyzed, as were individual factors (e.g., gender, race/ethnicity, grade, and information communication technology use) that impacted these structural characteristics. Differences in the use of information communication technology (ICT) and participation in informal and formal social activities across academic tracks also were examined. Finally, factors that predicted participation in formal and informal social activities were explored (e.g., structural ego network characteristics, individual factors). Examining the structural characteristics ego networks of adolescents with and without disabilities provides critical information that can be used by researchers and practitioners to develop interventions that address both individual and institutional factors, recognizing the reciprocal nature of relationships and the influence that institutionalized systems can have on the development of ego networks.

In the following chapters, I present information on the research that led to the development of my social capital model, the methodology used to test the tenants of my social capital model, and the results and implications of the analyses. In Chapter 2, I describe relevant theory and research on social capital, how social capital can be measured through ego networks, how those ego networks influence how adolescents socially connect with their peers through information communication technology and informal and formal social activity. Chapter 2 begins with a framework for thinking about social capital represented through ego networks which leads
to the introduction of my social capital model and ends with the research questions derived from this review of the literature. Chapter 3 provides the methodology used to gather and analyze the data. In Chapter 4, I discuss the results of the study. Finally, in Chapter 5, I discuss what the results mean for supporting the development of social capital and valued outcomes in adolescents with and without disabilities.
Chapter 2

Literature Review

Humans are social beings. From the city dweller who lives alone but routinely stops in at the local coffee shop to the rural farmer who plans a Friday night barbecue with his neighbor, humans from all walks of life seek out others in social environments. The role of social environments, gatherings and interactions was first explored in Jacob L. Moreno’s seminal work, *Who Shall Survive?* (1934). Moreno argued that community is dynamic and forever strengthening and weakening the bonds of its members. Particularly, “tendencies must emerge between the different [communities] drawing them at one time apart and drawing them at another time together” (Moreno, 1934, p. 3). In this manner, interaction amongst community members is natural, dynamic, and influenced by both the community structure and the community issues that arise. Purposeful social interaction leads to social connections based on community structures and common issues; it can be seen in the social gatherings of families and friends, in places of work where resources are made and exchanged, and during community events organized around a community issue (e.g., youth unemployment, violence in the community).

Being socially connected has long been a highly valued characteristic in American society. In his seminal work, *Democracy in America* (1835), Alexis de Toqueville recognized that the basic liberties stated in the Declaration of Independence established the right to and meaning behind a socially connected American society.

Americans of all ages, all conditions, and all dispositions, constantly form associations. They have not only commercial and manufacturing companies, in which all take part, but associations of a thousand other kinds—religious, moral, serious, futile, extensive, or restricted, enormous or diminutive. The Americans
make associations to give entertainments, to found establishments for education, to build inns, to construct churches, to diffuse books, to send missionaries to the antipodes; and in this manner they found hospitals, prisons, and schools. If it be proposed to advance some truth, or to foster some feeling by the encouragement of a great example, they form a society. … Nothing, in my view, deserves more attention than the intellectual and moral association in America (Democracy in America, 1835, Chapter 5).

Although social connections are not exclusively American, the country’s founding principles of “certain unalienable rights ... Life, Liberty, and the pursuit of Happiness” (The Declaration of Independence, 1776) creates a structure where citizens can readily assemble to create social connections for self-designated political, civic, and social purposes. These connections, de Toqueville argued, are used as a system, a form of capital, similar to financial or human capital, to exchange information and resources benefiting both the individual and the community.

Social connections are a valuable resource for individuals as they create networks of connected people through which information and resources can flow. The resources gained through social connections have been referred to as social capital; the term capital being important because it recognizes that the connections one makes with others can be used as an asset to exert influence, gain opportunity, and improve one’s status. This study is an examination of access to social capital for adolescents with and without disabilities, through formal and informal social connections with peers. The study is based on a model of how resources flow through a social capital mechanism.

The literature has defined social capital as the social connections an individual has and the opportunities those social connections provide. It is measured through network analysis,
using whole networks (i.e., networks of groups) or ego networks (i.e., an individual’s network). This utilized ego networks as the primary measure of social networks, for reasons described subsequently. Researchers also have suggested that the characteristics of an adolescent’s ego network are influenced by multiple personal and institutional characteristics, which will be described throughout this chapter and were systematically analyzed as part of the research design. Of particular interest are how personal characteristics (e.g., gender, grade, race/ethnicity, crowd membership, information communication technology use - ICT) and institutional characteristics (academic tracks used by school systems) influence an adolescent’s engagement in informal and formal social activities.

I begin this chapter with an overview of the microeconomic model of capital that describes different types of capital (i.e., financial, human, physical, social) available to the individual, and how these forms of capital act as resources to the individual and influence individual action. I then introduce a social capital model derived from research that attempts to explain how social capital functions for adolescents. Next, I describe research on the measurement of social capital with adolescents with and without disabilities, with a specific emphasis on the role of ego network analysis. Finally, I summarize research on (a) the different forms of social capital available to the adolescent, (b) the personal and institutional factors that shape the access to social capital and (c) outcomes of access to social capital, each of this are key elements of the social capital model.

**Overview of the Microeconomic Model of Capital**

**Forms of capital available to the individual**

Economic theory recognizes various forms of capital available to the individual (financial, physical, and human, see Figure 2.1). This capital can be leveraged to create, develop,
and facilitate opportunities and experiences for individuals and community members (Gottheil, 2009). Physical capital refers to the goods a person, company, or community uses to produce a good or service. For example, a laptop for writing articles is physical capital for a journalist. Paint and a canvas are physical capital for an artist. Financial capital refers to the money individuals or companies use to buy goods or services. The money a journalist has to buy a laptop to write articles is considered financial capital. The third type of capital is human capital and includes the education, skills, and knowledge a person has to provide the good or perform the service. Journalistic training is one form of a journalist’s human capital just like artistic training is human capital for the artist. All of these forms of capital work together to enable individuals (and companies and communities) to exchange goods or services.

A fourth form of capital, social capital, has been introduced by social scientists, particularly sociologists, political scientists and anthropologists, and more recently educational scientists, to emphasize the influence and importance of social connections and social structures (Bourdieu, 1986; Burt, 1994, 2000; Coleman, 1988; Lin, 2001; Wasserman & Faust, 1994; Wellman & Berkowitz, 1997). In the above example, the personal relationships available to the journalist may increase access to interviewees who provide story details. For the artist, social capital is the connections the artist has to community members. Here, the artist makes connections with community members with the understanding that these connections may provide opportunities for future artistic employment. Social capital is a valued resource the individual utilizes to exchange resources with others.
But, why do people make connections with others? What personal and institutional factors influence the connections that people build with others throughout the lifespan, particularly in adolescence?

**Social Capital Model**

To understand the role of social capital and the factors that impact social capital in adolescence, a model is needed to organize the diverse body of research on social capital. Social capital theory suggests that the relational nature of social connections serve as a conduit for information to flow, for opportunities to be accessed, for behavior to be influenced, and for social status to be improved (Carolan, 2014). Figure 2.2 provides a framework for understanding the flow between individual and institutional characteristics, social connections (i.e., whole and ego networks), social capital, and valued life outcomes (e.g., adolescent participation in social activities). There are many valued life outcomes that are enhanced by access to social capital, one of which, particularly for adolescents is participation in social activities (both informal and formal) as this creates opportunities for social connections to grow and develop and for social capital to be enhanced. These relationships are shown in Figure 2.2. Information and resources
flow from the network (whole and ego) and create social capital and opportunities for social activity. These opportunities then flow back into the model, creating more opportunities (or when opportunities are limited, more barriers) to enhanced social capital. From the start these factors are influenced by individual and institutional characteristics. Thus access to networks, social capital, and the attainment of outcomes related to social activity for adolescents (which further enhances social capital over the lifespan) are shaped within a complex ecological system. Understanding the influence of personal and institutional factors provides a mechanism to understand the cascading effects (and needed supports to address these effects) for adolescents.

In the following sections, I will review research on the salient personal characteristics that researchers have hypothesized influence opportunities to access to peer social connections. These personal characteristics include gender, grade, race/ethnicity, disability status and support needs (Brown, Bakken, Ameringer, & Mahon, 2009; Griesler & Kandel, 1998). These personal characteristics influence the way social connections look and act, making social connections unique to each individual. They also shape the opportunities adolescents have to build social connections in direct and indirect ways. For example, in terms of disability and support needs, youth often have differential access to inclusive environments and peer networks because of institutional placement decisions made through formal and informal tracking policies implemented by schools (Byrne, 1988). This then influences crowd membership, or the type of peer groups adolescents “hang out” with, which further influences access to social connections and capital.

However, prior to reviewing the research on individual and institutional characteristics, it is necessary to establish what researchers suggest are valid and reliable means of measuring social connections and their relationship to outcomes for adolescents with and without
disabilities. One way researchers have measured social connections is through social network analysis. Social networks can be represented by mapping connections across a whole network (social structure of a group with identified boundaries, for example a classroom) or through an ego network (identifying the structure of an individual’s network where the connections occur without bounding the network by a setting such as a classroom). In the next section, I present current definitions of social capital and how social capital has been measured based on these definitions highlighting the relevance of ego network analysis for adolescents with disabilities.
Figure 2.2

Social Capital Model Based on Individual Characteristics

Social Capital
The social connections and the opportunities and resources those connections can provide – measured through social networks analyses (ego and whole networks)

Valued life outcomes (e.g., social activity) enhanced by access to social capital

Adolescent social activity that leads to social capital:
Informal (e.g., hang out w/ friends at home/friend’s house)
Formal (e.g., hang out w/ friends at school sponsored events)

Individual and institutional characteristics (e.g., gender, grade, race/ethnicity, disability, academic track, crowd membership, ICT use) impact both ego & whole networks for adolescents

Whole network analysis
Ego network analysis
Definition and Measurement of Social Capital

Social capital, as a theory, was first discussed in Moreno (1934). More recently, social capital, as a construct, has received increased attention (Bourdieu, 1986; Coleman, 1988; Lin, 2001; Putnam, 1993, 2000). Researchers and theorists across fields such as sociology, education, economics, business, and now mathematics have examined measures of social capital and its impact on (a) the flow of resources through networks (Borgatti & Lopez-Kindellm 2011; Wasserman & Faust, 1994; Wellman & Leighton, 1979) and (b) behavior within and amongst communities (Putnam, 1998) and individuals (Portes, 2000).

Social Capital Theories

Although social capital theory was first introduced by Hanifan (1916) to describe rural school administrators’ use of connections to further services for students, social capital, as a specific term, was coined by Jacobs (1961) in her work on keeping cities personal and supportive of social interactions (e.g., walking, biking, close neighbors). In the 1970s and 1980s, sociologists and political scientists including Bourdieu (1986), Coleman (1979), and Putnam (1993, 2000) expanded the use of the term, beginning to explore social capital and its benefits for the individual and community.

Theorists including Bourdieu (1986), Coleman (1979), and Putnam (1993, 2000) defined social connectedness as a continuum of relational ties the individual has with others in their community. These ties can provide resources and guide individual behavior. At one end, the socially connected individual has many diverse ties: family, friends, colleagues, support providers, and community leaders. Through these ties, socially connected individuals provide and receive support, information, and resources (Putnam, 2000; Wellman & Berkowitz, 1997). At the other end of the continuum are individuals with few social connections who are isolated.
from their community. They may have one or two ties to individuals (e.g., one friend, one teacher) or groups (e.g. segregated group) or may have no ties at all to the community (Wellman & Berkowitz, 1997). Since ties to community members influence an individual’s access and connection to information and resources (Coleman, 1988; Wellman & Berkowitz, 1997) the degree of social connectedness one experiences can significantly impact functioning and outcomes (Cacioppo & Hawkley, 2009). Furthermore, an individual’s social connections form unique social structures and these structures influence relationships and access to resources. While social capital itself is difficult to measure, social connections can be used as a proxy measure for access to this type of resource.

Social capital theory recognizes that social connections are a resource to the individual where (a) information is exchanged, (b) status can improve, and (c) opportunities and access to make improvements are available. Social capital works through the flow of information through networks, sometimes referred to as network flow (Borgatti & Lopez-Kidwell, 2011). Network flow maps the way resources move through a network of connected individuals. How those resources move through the network and what benefits the resources provide the individual have been theorized differently. Some social capital theorists explain these resources as providing support to the individual (i.e., bonding; Bourdieu, 1986; Coleman, 1988) while others view the resources as providing opportunities to get ahead (brokerage; Burt, 1994, 2001). Still others have recognized that individuals use networks and the available resources for both bonding and brokering purposes (Lin, 2001). In the following sections, I discuss, in detail, bonding and brokering social capital theories and how Lin has synthesized both.
**Bonding social capital.** In bonding social capital the connections within a group provide social and emotional support that create obligations (Bourdieu, 1986) or trust (Coleman, 1988; Putnam, 2000).

**Social capital creates obligations.** Bourdieu (1986), a French sociologist, sought to understand how upper and middle class systems were formed and maintained within and between generations. He acknowledged that economic vitality was not reason enough to sustain such a position over time. He theorized that the social connections and networks that people make within their communities help them maintain and exert power over systems. Through this power, they obtain opportunities that people in other classes do not have, supporting and maintaining their economic status (Bourdieu & Wacquant, 1992). Examples of this might include access to resource rich neighborhoods or elite private schools where social connections provide later access to job opportunities and financial capital. The social structure created by the networks, according to Bourdieu’s theory, supports the maintenance of upper middle class and upper class lifestyles through information and resource sharing. This makes it difficult for those without access to this type of social capital (e.g., low to middle class individuals) to change their position.

**Social capital creates trust.** More recently, Coleman’s (1979, 1988) and Putnam’s (2000) social capital theory acknowledged social connections as a form of capital, but argued that social capital is available, albeit in differing degrees, to all individuals within a community. Social capital, in their view, is an individual’s use of social systems, friendships, group membership, and personal connections to connect with other communities or community members. Through these connections, an individual can gain or exchange information/resources and, in the process, improve their quality of life (e.g., employment, leisure opportunities, independent living
outcomes; Coleman, 1988; Putnam, 1993; 2000). Coleman defined social capital not as what it is, per se, but by what it does. In his view, social capital is not created and maintained by a single individual or group but by a collection of “entities” that have some form of “social structure” (Coleman, p. 297) and that structure helps to “facilitate certain actions…within the structure” (Coleman, p. 298). It is these two elements, creating structure for social relations and pathways for action to be taken by the individual, that create opportunities and outcomes not otherwise available to the individual. In this manner, social connections are more likely to be used to find a good neighborhood to live in, obtain a job, and in the context of high schools for example, gain knowledge of which social activities to participate in. These connections (i.e., ties), albeit difficult to define and measure, are an integral form of capital within and between communities and individuals.

For Putnam (2000), social capital’s power is most effective when it occurs within “a dense network of reciprocal social relations” (p. 19) where relations can help the individual “get by” (i.e., bonding social capital) or “get ahead” (i.e., bridging social capital; Briggs, 1998, p.2). Bonding social capital refers to the strong ties amongst homogeneous network members (i.e., family members, friends, neighborhood members) that provide the individual with strong “emotional or physical support” (Zhang, Anderson, & Zhan, 2011, p. 121). In relations with strong bonds or well-connected individuals, information can be readily transferred throughout the network. While these ties help individuals with the day-to-day operations of their life, they do not provide any new information or resources to help the individual’s position advance. For adolescents with and without disabilities, bonding social capital through peer networks may be important for providing emotional and social support as peers become more important to their social development.
**Brokering social capital.** In contrast to bonding social capital, it is bridging social capital, referred to as brokerage in the social network literature (Carolan, 2014), that brings individuals or networks from heterogeneous backgrounds together. Burt (1994, 2000) theorized that it is the spaces between connections that give the individual a competitive advantage and make social capital an important resource for the individual. For Burt, when an individual connects two otherwise unconnected groups together, the individual benefits by being the avenue through which information and knowledge flow from one group to the next. Through these bridging ties, individuals have greater access to new information, resources, and opportunities. While bridging ties are generally weaker, the unique information and resources gained can lead to economic, educational, and vocational advances (Briggs). Briggs argues that the bridging ties are more essential to the individual as these are the ties that provide information and opportunities to get ahead. For adolescents with and without disabilities, linkages between two networks can be important for obtaining information about activities that further develop their self-identity (e.g., employment, non-school affiliated clubs or sports).

**Bonding and brokering.** While there is evidence that both bonding and brokering social capital are resources to the individual, some researchers have recognized that the dynamic nature of social connections means that different situations or environments will call for bonding or brokering social capital. Lin (2001) solidified this line of thinking by defining social capital in three ways: social capital is an investment one makes in the social connections one has, these investments provide the individual with access to resources embedded in the social connections, and that when one invests and accesses embedded resources, the individual gets a return on that investment. In acknowledging the value of both bonding and brokering social capital using Lin’s social theory (2001), a key question is why do some individuals develop stronger social
connections than others? What personal and institutional factors impact access to resources or that impact the flow of resources through the system?

**Measuring Social Capital**

In order to understand the influence of social capital and its various forms as well as the influence of personal and institutional factors on social capital, systematic ways to measure social capital are critical (Carolan, 2014). Bourdieu (1986), Coleman (1988), and Putnam (2000) theorized the impact of social capital, but Burt (1994) was the first to attempt to operationalize and measure social capital and over the past two decades researchers have expanded and refined his methodology developing empirically based approaches to define and quantify social networks. In measuring social networks, researchers assume that social capital and the resources gained through social connections flow through connections between the individual and other members of his/her environment, defined as alters in the social network literature. Table 2.1 provides a brief overview of the key social network principles that guide social network analysis.

Table 2.1

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<th>Network Principles</th>
<th>Example</th>
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<td>Actors and their actions are interdependent rather than individual units.</td>
<td>Adolescents’ participation in an after school activity is, in part, due to the friends attending.</td>
</tr>
<tr>
<td>Relational ties provide paths for information and resources to travel to and from actors and their alters.</td>
<td>Adolescents’ knowledge of an art exhibit competition is obtained through friends in an art club.</td>
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<tr>
<td>Personal network analysis recognizes that network structure provides opportunities and constraints for individual behavior. Networks structures are the patterns of relational ties between actors and alters over time.</td>
<td>Weak ties to alters may lead the actor to stop attending art club. Adolescents’ friendship groups change over time as relationships become stronger or weaker.</td>
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*Note. Carolan, 2014; Wasserman & Faust, 1994*

Key features of empirical social network analysis include (a) analyses reflective of the relational nature between individuals, (b) analyses through empirical data, (c) graphic representation of relations, and (d) complex mathematical computations that model social life (Carolan, 2014). Network analysis has been used in multiple social science fields (e.g.,
economic, political, educational, sociological) to examine: preschoolers’ academic skills (Hanish et al., 2007); ethnic diversity (Rodkin et al., 2007); bullying (Espelage et al., 2007); social support (Briggs, 1998; Gottlieb 1981; Kadushin, 1966; Lin, Woelfel, & Light, 1986; Tracy & Whittaker, 1990; Wellman, Carrington, & Hall, 1988; Wellman & Wortley, 1990); community membership (Blakeslee, 2012; Poortinga, 2006; Wellman & Leighton, 1979); participation in extracurricular activities (Schaefer et al., 2011); consensus and social influence (Doreian, 1981; Friedkin, 1986; Friedkin & Cook, 1990; Mardsen, 1990); and life outcomes for young adults in the foster care system (Blakeslee, 2012; Comulada, Muth, & Latkin, 2012).

Social network analysis utilizes a particular set of vocabulary to describe the network members and the network structures. Networks encompass the individuals (i.e., actors) in a group and the ties the actors have with network members (i.e., alters). Specifically, the actor is the individual whose network is being analyzed. The alters are any network members to whom the actor has or could have a relational tie. There are two primary approaches currently used in the literature to analyze these network structures – whole network analysis and ego network analysis. Whole network analysis examines the social connections (i.e., relational ties) between members in an a priori bounded population (e.g., ties between members in a class or club). In contrast, egocentric network analysis (from here, ego network analysis) examines the social connections experienced by the individual from the individual’s perspective. In ego network analysis, “scholars are standing in the center of a person’s world and analyzing who he or she is connected to and with what consequences” (Wellman, 2007, p. 111). The following sections describe these two approaches, and argue that ego network analysis allows for a more complex examination of the multiple ties that occur within complex ecological systems.
**Whole network analysis.** At its foundation, network analysis views the individual’s relational ties as the analysis unit, rather than the individual. Using social network analysis, one can model the relationships experienced by the individual and examine how these structures impact one’s experiences (Wasserman & Faust, 1994). In whole network analysis, researchers determine, a priori, the network boundaries and ask individuals to report on their relationships with all members of the bounded network. For example, a researcher may want to understand the social network of a classroom. The researcher will then present all classroom members with a list of classmates and asks each student to report with whom they are friends and how close they feel to each member. This leads to a matrix of information on the position and relations of each member of the network (Carolan, 2014).

Whole network analysis is limited, however, by its bounding of social networks within a specific context (e.g., classroom). As such, whole network analysis focuses much more on the measurement of bonding social capital, without addressing the additional benefits of brokering social capital that may occur outside of the context of bounded networks. Further, Child and Nind (2012) point out that determining network status by measuring who is and is not connected in a bounded network can stigmatize students who are not part of the bounded networks. Further, even when individuals are part of the bounded network by asking who actors are and are not friends with, researchers may be inadvertently propagating stereotypes of popularity and exclusion.

The utilization of boundaries in whole network analysis puts the power of identifying networks and where individuals obtain and exchange support in the hands of the researcher. Whole network analysis is limited in that the network structure is representative of the boundaries imposed on it (Laumann et al., 1983). If the researcher fixes where the individual can
report relationships (i.e., relationships in school), the respondent automatically is limited in his/her ability to report relationships and supports from other contexts, particularly if they occur outside the predetermined boundaries of a classroom or school. In the interest of understanding where and how the individual obtains and exchanges resources, examining social networks from the perspective of the individual in unbounded contexts may be more useful.

Whole network analysis has rarely been applied to the measurement of social networks with children and adolescents with disabilities. Instead, researchers have tended to focus on changes in individual characteristics or the skills of students with disabilities (e.g., communication or social interaction skills; Buzolich & Baroody, 1991; Carter & Maxwell, 1998; Cushing & Kennedy, 1997) or qualitative assessments of group membership (Garrison-Harrell, Kamps, & Kravits, 1997). However, when researchers have attempted to understand network positions or changes in network position, they have tended to apply whole network analysis to a classroom or school. For example, Pearl et al. (1998) examined the social networks of children with disabilities in an inclusive classroom using a method call Social Cognitive Mapping (Cairns et al. 1985). The authors found that, overwhelmingly, children with mild disabilities were “social isolates” (p. 180) or not members of any social network. Farmer et al. (2011) also used whole network analysis to measure the social network status of students with emotional and behavioral disorders in rural high schools and found that while students were integrated into classroom social networks most often their membership was peripheral and the groups with whom they affiliated tended to support antisocial behavior and school problems. The authors recommended that researchers examine the network membership of students with specific disabilities (e.g., intellectual disability, autism, learning disability) and associated factors (e.g., cliques, academic
tracking) that may contribute to network membership of students in suburban and metropolitan areas.

**Ego network analysis.** An alternative to whole network analysis is ego network analysis, a methodology that focuses on the perspective of the individual actor. Specifically the individual is asked to identify who they are associated with, the quality and function of those relational ties and the ties amongst identified alters (Freeman, 1979; Marsden, 2002; Wellman & Leighton, 1979). Ego network analysis has been used extensively to determine an individual’s unbounded network connections (McCarty & Govindaramanjam, 2005). Seminal studies (Fischer, 1982; Wellman, 1979) suggest that ego networks are often varied and dispersed geographically, and that individuals have stronger ties to people with whom they share a social context. This methodology was included in the U.S. General Social Survey in 1984 and again in 2004 to explore the social networks of adults. The findings suggest that Americans have dense networks, network members are often tied to each other, that many friends are named as close as family, and that the average number of friends Americans have has declined from three (Burt, 1984) to two (McPherson, Smith-Lovin & Brasbears, 2006).

In terms of the ego networks of adolescents, researchers have found that they typically report having 4-5 close friends (Steglich, Snijders, & West, 2006) and that these friends are not necessarily in bounded social environments. Adolescents with efficient ego networks tend to report more positive social and emotional outcomes (Lee & Smith, 1999; Pittman & Haughwout, 1987) and have higher propensities to engage in social activity and effectively use communication technology to build relationships (e.g., texting, calling on a cellphone; Hogan, Carrasco, & Miller, 2006). Knowledge of ego networks has also been used to develop
interventions to reduce (a) gang involvement (Fleisher, 2005), (b) aggression (Neal, 2007), and (c) peer-influence substance abuse (Pearson et al., 2006).

Ego network analysis has been applied to understanding the social connections of adolescents with disabilities. Lippold and Burns (2009) examined the social support available to young adults with intellectual and physical disabilities using ego network analysis. They found that individuals with intellectual disability had limited personal networks. Perry and Pescosolido (2010) examined the ego networks of 173 individuals aged 16 – 72 with serious mental illness and the impact these networks had on outcomes during a health crisis. They found that having network members who could provide a “verbal exchange of information, opinions, and advice may be a critical mechanism in this relationship” (Perry & Perscosolido, 2010, p. 355). Kef, Hox and Habekothe (2000) found adolescents who are blind or have a visual impairment had a similar number of friends (four) to age peers without disabilities, but that the identified friends were much older. Ego methodologies have been used in examining alcohol use of transition age young adults (Lau-Barraco & Collins, 2011), health outcomes for individuals with intellectual disability (Emerson & Hatton, 2007), relationship patterns and social support of transition age youth in foster care (Blakeslee, 2012), and on the realization of rights of young and older adults with severe disabilities. For example, informal network members have been found to be gatekeepers or mediators to institutional and individual level supports (Bunning & Horton, 2007; Denn et al., 2010).

Critical to the application of ego network analysis to adolescents with and without disabilities are specific methodological considerations and procedures that are used to define the structure of ego networks. These considerations and procedures are described in the following section.
**Ego network methodology.** Ego network data can be collected through interviews and observations but most often occurs through surveys (Carolan, 2014; Hogan, Carrasco, & Wellman, 2007; Wasserman & Faust, 1994). Recently, network researchers have utilized Computer Assisted Self-Administered Interview (CASI; de Leeux, Hox, & Kef, 2003) or Computer Assisted Personal Interview (CAPI; Black & Ponirakis, 2000) to study ego networks. CAPI and CASI utilize computers to collect network data; in CAPI, the researcher interviews the respondent and records the data using computer software. The utilization of audio and video CASI (self-directed interview) with touch screens is useful for including individuals who are unable to read or persons with disabilities for whom traditional survey methods are not accessible (Black & Ponirakis; de Leeuw et al., 1997; Gerich, Lehner, Fellinger, & Holzinger, 2003; Parsons, Baum, & Johnson, 2000). While ego networks do not provide a complete picture of a community’s social structure, representative sampling methods, common in the social sciences, are employed to allow for generalization to the larger community (Carolan, 2014; Marsden, 2002).

To conduct ego network analysis, researchers collect data on: (a) an ego (i.e., individual) and his/her characteristics (i.e., ego attributes), (b) the group of friends (i.e., alters) connected to the ego (i.e., alter name generation; ties), (c) characteristics of the alters (i.e., alter attributes), (d) characteristics of ego-alter ties (i.e., how does ego know the alter; how close does the ego feel towards the alter), and (e) whether the alters are connected (alter-alter ties) (Carolan, 2014; Marsden, 2002; Wasserman & Faust, 1994; Wellman & Wortley, 1990). The unit of observation is the ego and all information obtained about the network is from the ego’s perspective. The ego is asked to identify network members to whom they have ties (i.e., alters), alter characteristics, and the structural (i.e., presence, size, density, durability, duration, accessibility) and functional
nature of the relational ties (Burt, 1984; Buysse, 1997; Marsden, 1990; McCarty et al., 2007; Tracy & Whittaker, 1990). Finally, the ego identifies alters who are connected to each other, which creates the network ties.

**Ego network questions.** In order to gather the data necessary for ego network analysis, questions in the following domains are included on surveys: (a) ego attribute, (b) name generator, (c) name interpreter, (d) alter attribute, and (e) alter-alter ties. Ego attribute questions seek information about the ego’s personal characteristics (e.g., demographics, hobbies, favorite subject in school). In name generator questions, respondents are asked to name a list of alters who fill a particular capacity (i.e., physical support, emotional support). For example, ‘Name the friends you have felt close to or with whom you share important information’ (Burt, 1984). Name interpreter questions require the ego to qualify their relationship with named alter (e.g., How close are you with alter X? How long have you known Alter X? How often do you communicate electronically with Alter X?). Alter attribute questions gather information about alters (e.g., grade, hobbies, activities). In alter-alter relationship questions, the ego interprets the relationships between all alters in their network. ‘Would you say that Alter A and Alter C are strangers, just friends, or especially close?’ Name interpreter, alter attribute, and alter-alter questions are asked about each alter and alter-alter relationship, respectively. Ego network surveys ask egos to free recall alters with whom they have a particular relationship (e.g., list your best friends; Rappaport & Horvath, 1961). Depending on the research questions, egos can nominate as many alters as they can (i.e., free choice), identify a specific number of alters and rate (i.e., tie strength; Burt, 1984), or rank order their relational ties to identified alters (e.g., in
order of importance). Egos then report the function of each tie (i.e., support provided) and the ties amongst alters in their network (Burt, 1984, 2000).

Data management. To summarize and quantify ego network analysis data, the data is represented in a row-wise matrix with egos in rows and ego characteristics, identified alters, ego-alter ties, alter characteristics, ego-alter tie characteristics, and alter-alter ties indicated in a series of columns. Some researchers gather characteristic and relational tie data on each alter by asking the same questions for each alter. This can induce a high level of respondent burden, however. In an alternative method, respondents are asked to identify an alter, answer name interpreter and alter-alter ties/relationships questions, and then move onto the next alter and repeat the sequence. This alter-sequence method (Kogovsek & Ferligoj, 2005; McCarty, Kilworth, & Rennel, 2007) was found to induce less respondent burden and enable the respondent to get into a rhythm of question response.

After collecting the data, researchers determine the structure of the ego’s network (e.g., structural components; visualization of the ego’s network) and the functional components (e.g., quality of connections) by applying mathematical equations to the range of responses across the data set. Structural components provide critical information on the flow of social capital, consistent with the social capital model introduced previously. Therefore in the next section, I include a description of structural components and how they are measured.

Structural components. Ego network structural characteristics include: network size, density, effective size, and efficiency. Network size is the number of ties identified in a network. Density, effective size, and efficiency are measures of Burt’s (1984; 1992) structural hole theory where holes in a network are useful for the ego in that the ego can serve as a conduit of information and resources between groups (i.e., brokerage social capital, as described earlier).
The effective size measure represents the ego’s network size with alters who are tied to each other only due to the presence of the ego. Efficiency is the number of pathways information needs to flow between alters, through the ego, and represents how quickly information can flow through the network. According to structural holes theory, having a higher network size and efficiency rating indicates the ego is obtaining more brokering social capital.

Density, effective size, and efficiency are mathematical representations of how resources may or may not travel through networks via the ego. For example, Figure 2.3 represents an ego with a network size of six (Alters A-F). Notice that Alter F and Alter E are not only connected to the ego but also connected to each other. The same is true for Alters A, B, and C. Alter D is only connected to the ego. Structural holes theory suggests that the ego can pass information learned from Alters E and F to Alter D or Alters A, B, and C where they would not otherwise be available. Taken together, the structural characteristics provide information on how “collective phenomena affect interpersonal behavior” (Wellman & Wortley, 1990, p. 560) in that the ego’s relationship with alters provide resources and opportunities that constrain or promote behavior (e.g., social activity; Hanneman & Riddle, 2009). Table 2.2 describes each ego network structural characteristic and how it is calculated.
Figure 2.3

*Structural Hole Visualization*

![Structural Hole Visualization Diagram]

<table>
<thead>
<tr>
<th>Structural Components</th>
<th>Definition</th>
<th>Formula</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network size</td>
<td>The number of people (i.e., alters) in the ego’s network. Each alter listed brings some amount of supports or resources to the ego</td>
<td>Total sum of alters listed</td>
<td>Number of friends or alters in a person’s network</td>
</tr>
<tr>
<td>Density</td>
<td>The ratio of ties to the possible ties and represents how quickly information flows among the alters, representing a form of social capital (Hanneman &amp; Riddle, 2009)</td>
<td>Density = $\frac{\text{Number of ties}}{\text{# of possible ties}}$</td>
<td>Ego has 6 total ties in a network out of a possible 12 network ties</td>
</tr>
<tr>
<td>Structural holes</td>
<td>The number of groups an ego identifies that are not connected to each other. For each unconnected group, a structural hole is identified (Burt, 1979).</td>
<td>Total number of holes between unconnected groups.</td>
<td>Ego has identifies 4 groups, three of which are connected. Ego has one structural hole</td>
</tr>
<tr>
<td>Effective size</td>
<td>Number of nonredundant ties</td>
<td>Effective size = $\frac{\text{Number of alters} - \text{Sum of Redundancy of alters}}{\text{Effective size}}$</td>
<td>Ego may be linked to Alter A directly and through connections with Alters D and F</td>
</tr>
<tr>
<td>Efficiency</td>
<td>The proportion of network ties that are not redundant and is a measure of impact of their ego network.</td>
<td>Efficiency = $\frac{\text{Effective size}}{\text{Actual size}}$</td>
<td></td>
</tr>
</tbody>
</table>
**Network size.** Network size is the total number of alters connected to the ego and represents how large or how small the ego’s network is (Wellman & Leighton, 1979). Network size is calculated by adding up all of the responses indicated by the ego on the name generator questions (Carolan, 2014). This measure is used in calculating all other network characteristics.

**Density.** Density (i.e., alter-alter connectedness) is a network characteristic that indicates the connectedness of alters in an ego’s network (Wellman & Leighton, 1979; Marsden, 1993; 2002). Density is calculated by adding up the total number of ties in an ego network and dividing by the total number of possible ties (Knoke & Yang, 2008). In bonding social capital where egos obtain support (e.g., emotional, social) from network members, highly dense networks indicate alters who are strongly connected. When researchers are examining bonding social capital (i.e., the support provided the ego by the alters), more dense networks are viewed as reflective of higher levels of bonding social capital.

**Effective size.** Effective size is the size of an ego’s network subtracted by the number of redundant alter ties. For each alter, this measure examines whether the ties the alter has are redundant ties with the ego. For example, in Figure 2.2, alter A has ties with the ego and alters B and C. Since alter A is tied to alters B and C without the presence the ego, the ties with B and C are redundant for alter A but could be tied with B and C indirectly, through the ego. The sum of all the redundant ties is then subtracted from the total network size. Given Burt’s Structural Holes theory, where the ego utilizes connections to obtain and exchange information with other network members (i.e., brokering or bridging social capital), having less redundancy in a network is important because that ego becomes necessary in connecting different groups of alters (seen in Figure 2.2 where the ego connects alters E and F with alter D or with alters A, B, and C). Without the ego present, these three separate network groups would not be connected.
**Efficiency.** Another measure of brokering or bridging social capital, efficiency is a norming measure that indicates the percentage of the network that is utilized efficiently by taking into consideration redundant ties and calculating the distance information would need to travel from one alter to another through the alter. Efficiency is calculated by dividing the effective size by the network size. This is a useful measure in that it represents the impact an ego has to network members (Hanneman & Riddle, 2009). For instance, if most of the network members are connected to each other without having to be connected through the ego (as in alters A, B, & C in Figure 2.2), then the impact that the ego has will be limited. Efficiency, therefore, represents the percent of the network that is being utilized efficiently.

**Limitations.** Similar to whole network analysis, ego network analysis has advantages and disadvantages. This methodology is useful in that relationships are identified where they occur so that researchers can examine the flow of resources through unbounded networks. Ego network analysis also is useful in understanding the link between the ego’s beliefs about group members and the perceived resources available to the ego. For example, Carolan (2012) studied the relationship between social capital, school size, and a high school student’s math achievement. By asking the each student to identify their three closest friends and how important grades were to those friends, from the ego’s perspective, Carolan found that students who identified their network members as emphasizing the importance of grades had higher grades themselves. From a social capital perspective, these connections represent resources that foster attention to the importance of academics (e.g., friends may provide assistance with homework or studying; friends may allow ego more study time instead of encouraging distracting activities).

However, ego network analysis has disadvantages as well. First, egos may be more likely to list alters with whom they have stronger ties at the expense of those with whom they have
weaker ties. If the outcome of interest is whether the network provides support to the individual (i.e., bonding social capital) this may be useful information. However if the outcome of interest is whether the network provides the ego with opportunity to gain and exchange other resources to get ahead (i.e., brokerage), this information may not be captured with a simple name generator.

Additionally, ego network analysis, through name generators, provides information on alters but not necessarily the alter’s social position in the network. Some researchers have developed a position generator methodology to supplement name generators. This type of questioning prompts the respondent to indicate connections with people in specific contexts or positions (e.g., name two people who could provide you support for getting a job). In doing so, the network resources available to the ego can be constructed and examined and can provide important information on how those resources may facilitate or impede action.

Overall, however, ego network analysis provides a rich opportunity to understand social connections across unbounded networks, and to explore the relevant personal and institutional factors that impact the (a) different forms of social capital available to the individual, (b) personal and institutional factors that shape access to social capital, and (c) outcomes of social capital. In the next section existing research on forms of social capital and the influence of personal and institutional factors are described. This research shaped the creation of the social capital model described previously.

**Research on Forms of Social Capital and the Factors that Shape it**

**Peer Relationships**

In their discussion on the impact of peer relationships, Bukowski and Hoza (1989) state: peers (a) are critical for fundamental skill development, (b) “contribute to a child’s sense of
social support and security” (p. 17), and (c) help develop a child’s self-concept. The ways in which an adolescent experiences these relationships, however, depends greatly on the individual’s current state of development. During adolescence, peers become a critical part of an adolescent’s social network so much so that adolescents will navigate different groups of peers to obtain or maintain a particular social status (Parker & Gottman, 1989).

As children transition to adolescence, the way in which adolescents interact changes. In turn, the ways in which adolescents seek and offer social support (i.e., exchange resources), the ways in which friendships are made, and the design and function of social relations change (Parker & Gottman, 1989). “Structural changes in social networks begin to occur as children are increasingly exposed to children of various ascribed statuses (e.g., race, sex, and ethnicity) and children encounter variability in peer personalities that were heretofore unimagined.” (Parkman & Gottman, p. 112). Of particular importance during this transition period are the adolescent’s understanding of (a) social status and its importance, (b) the influence of histories and confirmation bias in forming opinions (resulting in selection effect), (c) how information is transferred between peers and groups, and (d) how group behavior influences individual behavior (Bukowski, Velasquez, & Brendgen, 2008; Price & Dodge, 1986). The adolescent’s desire for friendship groups (i.e., social networks) is often so great that they work hard to maintain social status and avoid peers that may thwart their status or limit access to desirable friendship groups, referred to as selection effect (Brown, Bakken, Ameringer, & Mahon, 2008; Kandel, 1978; Parker & Gottman). They begin to readily recognize similarities and differences amongst their peers, establish themselves within social groups, and develop networks with adolescents who are similar to them. This is what Lazarsfeld and Merton (1954) referred to as “homophily” or Cairns, Cairns, Neckerman, Gest, and Gariepy (1988) coined “cliques.” More
specifically, adolescents begin to view their status as determined by their peers and become keenly aware of how their behavior or the behaviors of others can disrupt or topple their social status and social group membership (Prinstein & Dodge, 2008).

Because of this, accessing and entering social networks may become difficult for those with limited access to opportunities for social network membership. Students who experience smaller networks or difficulties obtaining network membership may attempt to enter desired networks through assimilated behavior. For instance, adolescents with lower status often emulate adolescents with high-status (Prinstein & Cillessen, 2003). The highly connected peer can choose to invite the isolated student into the network or not. Those wanting to fit in will begin to assimilate or socialize in ways similar to these peers. For example, in discussing the patterns of influence peer groups enact on the individual, Bukowski, Velasquez, and Brendgen (2008) state:

… the broader group provides a particular climate that may either favor or disfavor particular characteristics of individuals, thus making a particular child more or less popular (see Boivin, Dodge, & Coie, 1995; Chang, 2004), and therefore affecting opportunities for friendship (Bukowski, Pizzamiglio, Newcomb, & Hoza, 1996) (p. 133).

Awareness of differences, then, becomes an influencing factor for the creation of social networks for adolescents. From a bonding social capital perspective, personal characteristics (e.g., support needs) or environmental systems (e.g., segregated classes) that prevent an adolescent from entering a network may limit access to the social and emotional support these adolescent networks can provide. However, from a brokering social capital perspective, if the adolescent’s personal characteristics (e.g., support needs) or the environment systems (e.g., inclusive classes) create a system where the adolescent
can act as a bridge between networks, he or she can act as a conduit to transfer information and resources between networks and utilize this information to what Briggs (1998) termed “get ahead” (e.g., getting helping on a homework assignment; gaining knowledge about and participating in an inclusive sports organization). However, it is not clear that social capital works for adolescents in this way, particularly for adolescents with disabilities who have different support needs, have limited exposure to different peers and activities, and can experience limited adolescent peer relationships

Adolescents with disabilities, peer relationships, and social capital. Typically developing children and adolescents often develop positive peer relationships and social connections through natural opportunities and supports (e.g., extra-curricular clubs, after school activities, neighborhood activities). However, adolescents with disabilities can experience isolation from peer relationships (Wagner et al., 2004) and fewer opportunities to access activities (e.g., Bult, Verschuren, Jongmans et al., 2011; Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). Adolescents with disabilities who may look or behave differently (e.g., communicate and socialize in different ways) are at even greater risk for isolation, both physically and socially, since natural supports for successful peer relationships to develop may not be available through institutional systems (e.g., extracurricular activity staff may not be knowledgeable about needed supports).

Schools can create school-wide opportunities for social interaction. High schools, specifically, are places where social and emotional learning can be emphasized, where community cohesion is encouraged and fostered, and where social opportunities both within and after the school day can occur on a regular basis. In this sense, schools should be hubs for social networks and social activity to occur. However, adolescents with disabilities continue to
experience limited access to social networks (e.g., Farmer et al., 1998; 2011; Kef et al., 2000) and participate in social activities at a much lower rate than age peers (King et al., 2009; Larson & Verma, 1999; Simeonsson et al., 1999). While I have presented evidence regarding the importance of social networks as it relates to social connection, and to a broader extent social capital, what becomes apparent is the need to address the factors that influence social network membership. Specifically, there are likely personal factors, such as disability that impact whether or not an adolescent has access to a social network. This is critically important as disparities in access to a social network can then influence the degree to which adolescents can achieve valued life outcomes, such as participation in social activities with peers. Previous research has indicated that personal characteristics can influence access to social connections and, in turn, social capital, although specific analysis of factors related to disability have not been fully addressed. For example, more work is needed on the impact of institutional policies based on disability label such as how academic tracking impacts access to social connections for adolescents.

The following section describes, through an ecological framework, how personal characteristics (from here individual factors), including disability and academic tracking, can impact access to social networks.

An Ecological View of Social Networks – Individual and Institutional Factors that Shape Access to Social Capital

An ecological view of social networks necessitates an analysis of the multiple individual factors across different environments and conditions that influence access to and opportunities for social connection. Historically, research has taken a limited view of access to and opportunities for peer relationships for adolescents with disabilities, only examining the
influence of disability label within a single, bounded environment (e.g., general education classroom). A more complex understanding of this phenomenon recognizes that adolescents experience multiple environments, that those multiple contexts can directly and/or indirectly impact an individual’s opportunities and experiences, and that each of these contexts and their nested relationships must be examined.

Bronfenbrenner (1979) described these multiple contexts as ecological systems. In ecological theory, multiple systems impact, directly (micro- and mesosystems) and indirectly (exo- and macrosystems), the opportunities and experiences an individual has. While Bronfenbrenner did not directly apply this theory to social connection or social networks, it has direct relevance for organizing our understanding of how opportunities and experiences for social connection emerge for adolescents with disabilities. As mentioned previously, the individual directly experiences both the microsystem (the setting and/or events experienced by the individual; for example the general education classroom) and mesosystem (the interaction of two micro-systems; for example, the general education classroom and the home environment). The exosystem (environments/settings outside the experienced setting that still have influence over the microsystem; for example, the local education agency [LEA]) and macrosystem, (the beliefs or cultural norms of the ecology members; e.g., academic tracking policies adopted by the LEA) are not directly experienced by the individual but can significantly impact opportunities and experiences. Ecological researchers also recognize that these systems are not static and examine how the ecology is experienced over time (i.e., chronosystem). Given that these systems are naturally interconnected, Bronfenbrenner argues isolating a problem or solution on one level is at the expense of understanding and addressing the influence of other systems.
An ecological framework is important when researching the social experiences of adolescents, particularly adolescents with disabilities, as their needs, opportunities, and experiences can be influenced directly and, indirectly, through community policies and belief systems. In a sense, their access to social networks and the information and resources exchanged via social capital, will only be fully realized through an ecological perspective. This requires that skills taught and supports and services provided consider needs across multiple systems. Researchers, teachers, administrators, families, or individuals with disabilities themselves who examine social connections or social networks at the microsystem level (e.g., adolescent social network membership given a student’s individual skills or characteristics without addressing school/community policies or belief systems) limit the scope and breadth of impact (Shogren et al., 2009). When an ecological approach is used, there is increased potential to make meaningful and sustainable changes as needs and supports will be identified for all members of the ecology, not just for the target individual (Shogren, Bradley, Gomez, … & Wehmeyer, 2010). Given that social connection, social network membership, and access to social activity, particularly for adolescents in high school, is dynamic and influenced by many factors, a closer examination of the interaction of ecological systems in this context is warranted.

Micro- and Mesosystem factors. As reported earlier, opportunities for and access to social connections or social networks with peers can be difficult for adolescents with disabilities. As a result, adolescents with disabilities often experience limited social networks and even isolation (Farmer et al., 2011; Pearl et al, 1998). To address this, researchers have examined social network membership from a microsystem and mesosystem perspective (Garrison-Harell, Kamps, & Kravits, 1998; Haring & Breen, 1992; Johnson et al., 2003; Trembath et al., 2009). In these studies, the researchers attempted to build social networks for adolescents with disabilities
through supports for peer interaction and with training and support, peers were able to support the adolescent with a disability. In these studies though, teachers or other adults identified peers to be in the adolescent’s social network rather than using social network analysis. As a result, it is difficult to ascertain whether the social network created in one microsystem would exist in the mesosystem (i.e., across microsystems). While an adolescent’s skill in gaining and maintaining social networks may differ from one microsystem to another, instituting supports across microsystems may improve the social network of students with disabilities in multiple contexts (Fisher et al., 2013). Regardless, this type of intervention is limited without addressing exosystem and macrosystem factors that create (and impede) opportunities for social networks and social connections to occur (i.e., academic tracking policies).

The next sections describe three key individual factors and one institutional factor that researchers have suggested impact access to social networks and involvement in social activity. The individual factors include demographic characteristics (gender, grade, race/ethnicity); crowd membership (cliques adolescents declare membership in); information communication technology use (ICT; an important method of communication for adolescents). The institutional factor is academic track, a proxy for support needs and disability label.

**Individual factors.** There are several different individual factors (i.e., personal characteristics) that impact an adolescent’s opportunities for or access to social networks or social connections. In my review of the literature, I identified three individual factors that influenced individual opportunities for social networks or social connections to occur; gender, grade, race/ethnicity, crowd membership, and ICT use, which will be reviewed in the following sections.
Demographic characteristics. Previous research has indicated that students create social networks with peers who are similar to them on gender, grade, and race/ethnicity (Ennett & Bauman, 1996), a concept call homophily (Lazarfeld & Merton, 1954). Researchers have found that girls tend to be more connected than boys, that students’ social networks become more connected in higher grades than in lower grades, and that minority students tend to have smaller networks (Urberg, Degirmencioglu, Tolson, & Halliday-Scher, 1995). Urbanity may also play a role as Farmer et al. (2011) found that girls had smaller networks than boys in rural schools, differing from findings in non-rural settings. There were similarities in terms of race/ethnicity and disabilities, however in rural schools, with non-White students and those with disabilities being significantly more likely to be isolated or peripheral members of networks. Farmer also established that students who were isolated or peripheral network members were also more likely to have friends who were identified as exhibiting anti-social behaviors. Researchers have also suggested an interaction between demographic characteristics, social network membership, and adolescent behavior. For example, peer pressure in social networks has been reported to be more of a concern for White students than African-American students (Griesler & Kandel, 1998). Robinson, Dalton, and Nicholson (2006) examined a peer network’s influence on smoking behaviors finding that having a peer who smoked was a significant predictor for smoking habits for White students but not African American students.

In additional to Farmer et al.’s (2011) findings that students with disabilities in rural schools are more isolated, disability researchers (Chenoweth & Stehlik, 2004; Mpofu, 2003; Partington, 2005; Widmar, Kempf, Sapin, & Galli-Carmanati, 2013) have also begun to examine the interaction of a disability label and practices adopted by schools to organize and deliver special education services. Such practices have the potential to impact access to social network
membership and social capital. Although the field is moving toward a supports model, where needed supports are identified in the context of inclusive community environments (e.g., the general education classroom), schools often organize services not around support needs but around programs that address institutional, rather than student needs (Schalock et al., 2010; Thompson et al., 2009). For example, many schools continue to use academic tracking practices, where students are placed into settings and curricula based on teacher judgments and assessments of skills (not supports) (see Byrne, 1988). Such segregation of students (e.g., placing students into special education classrooms where they do not have access to age peers), however, has been hypothesized to limit access to opportunities for social connection and social capital to develop (Brunello & Checchi, 2007; Byrne, 1988; Heck, Price, & Thomas, 2004); however this issue has never been directly studied using ego network analysis.

Crowd membership. Crowd membership also has been linked to social network membership and the social connections adolescents build. As previously mentioned, adolescents are keenly aware of their group membership and, as a result, tend to associate with peers who they deem similar to themselves, sometimes referred to as cliques or crowds (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988). Ryan (2003) defines these crowds as groups of adolescents who are not necessarily all close friends, but who all are similar based on a “reputation trait” (p. 1137). Crowds do more than identify certain students with particular reputations based on group membership; they also provide a mechanism for students to measure their reputation or status against the others within the same crowd or between crowds (Brown et al., 2008). Adolescents can assign themselves to a particular crowd or be assigned to a crowd by their peers if that adolescent projects an image related to a particular crowd (Stone & Brown, 1999). For example, if a girl dresses like an athlete and is interested in athletics, other adolescents may identify her as
being in the “jocks” crowd, whether or not she identifies with this group herself. As a result, being a member of a particular crowd or being perceived as a member of a particular crowd may impact an adolescent’s access to or opportunity for social networks and social activity to occur. The most frequently identified crowds in the research literature include Popular, Jock, Brain, Normal, Tough, Outcast, and None (Brown et al., 2008).

*ICT use.* Another key attribute related to adolescent social networks and engagement in social activity is how adolescents communicate with friends through Information Communication Technology (ICT). While demographic characteristics and crowd membership can impact an adolescent’s access to and opportunities for social networks and engaging in social activity, having access to the knowledge of social networks and social activities is also important. In the case of adolescents and given the modern means of communication, understanding the utilization of communication technology (i.e., technological forms of communication such as cellphones or email) is critical.

ICT use refers to the type of communication an individual uses to interact with his/her friends (Carrasco & Miller, 2006; Wellman, 2007). ICT use has been defined in the literature as usage of landline phone, cellphone, email, and texting. Previous research has indicated that effective ICT use can promote social activity and social involvement (Carrasco, Miller, & Wellman, 2009) through what Carrasco et al. (2008) refer to as “social accessibility” or the availability of connections. ICT is an important communication mode to understand as adolescents use ICT to connect with friends with whom they have a variety of different relationships (Reich et al., 2012).

The use of ICT by individuals with disabilities has been related to quality of life outcomes such as literacy, social networks, independence, and empowerment (Davis, Stock, &
However, those with more intensive support needs report using information communication technology to communicate with friends significantly less frequently than age peers (Cadwallader & Wagner, 2003; National Center on Education Statistics, 2001). Students with more significant support needs such as those with intellectual disability have also been shown to have limited access to communication technology (Wehmeyer et al., 2004). Li-Tsang, Yeung, and Hui-Chan (2005) addressed this need by designing an intervention that taught individuals with intellectual disability to utilize communication technology and instruct family members in supporting the technology usage. The participants reported increased use of the technology to communicate. Family members reported improvements in social inclusion for their family member and expressed the importance of support for instituting this technology. This provides evidence that there may be differences in communication technology use amongst students with disabilities based on support needs and that these differences may impact social networks and social activity.

**Exo- and Macrosystem factors.** In addition to personal factors, there may be many institutional factors or belief systems that impact an adolescent’s access to or opportunity for social networks to occur and social capital to form. As mentioned previously, one such factor may be the institutionalized policy of academic tracking. While individual and peer-level factors certainly influence the social network membership of adolescents with disabilities, school systems, through policies and practices including academic tracking, may exert an even stronger influence on outcomes. The policy of academic tracking into segregated vs. inclusive environments adopted by many school
districts for students with disabilities may be most relevant to the degree to which students with disabilities can access opportunities for social network development.

**Academic tracking.** In the United States, it has been common to group high school students in academic tracks across subjects where students are grouped together based on common academic skills to reduce group member differences (Ross & Harrison, 2006; Slavin, 1990; Wouters et al., 2012). Tracking, however, has been shown to (a) limit access to a challenging academic curriculum (e.g., Gamoran, 1987; Hallinan, 1994; Lucase, 1999), (b) lead to inconsistencies in delivery of content, (Harris, 2011), (c) result in differences in the availability of rigorous curriculum (Harris, 2011; Letgers, Balfanz, Jordan, & McPartland, 2002), and (d) result in increased salience of student differences that negatively influence student self-concept and teacher perceptions of students (Byrne, 1988; Trautwein et al., 2006; Wouters et al., 2012).

Despite limitations, tracking is a common practice in American high schools (Wouters et al., 2012), and is frequently used as a proxy for organizing students with disabilities by level of support need, therefore placing students with more significant support needs in more restrictive (and frequently less academically challenging) settings (Hallinan, 1994; Harris, 2011; Kullik, 2004; Oakes, 1985). In relation to social networks, researchers have said that, “track position provides a single, highly visible, unambiguous label that instantaneously communicates educational needs and, sometimes, stigma” (Rosenbaum, 1976, p. 169).

Despite the prevalence of academic tracking, the impact of tracking on the academic and social experiences of adolescents with disabilities, their ego networks, and engagement in formal and informal social activities has not been fully explored. The practice of academic tracking
provides a potentially useful explanatory variable to understand social network development for adolescents with disabilities as tracking may exacerbate salient differences between students through the mechanism of social comparison (Byrne, 1988). In social comparison theory (Festinger, 1954), individuals, without an objective standard from which to compare one’s ability, will use others within the environment to form their opinions of themselves. Students, then, compare themselves with those students with whom they are grouped and those with whom they are not grouped (Marsh, 1984). This comparison can impact a student’s (a) evaluation of one’s ability (Byrne; McKay, 1984; Trautwein et al., 2006), (b) academic achievement (Gamoran, 1987; Oakes; Lucase, 1999), (c) exposure to “academically rich curriculum” (Harris, p. 845), and peer relationships in which one engages (Byrne; Logis, Rodkin, Gest, & Ahn, 2013).

Academic tracking also can have a significant impact on social networks and social activity. Researchers have found that individuals will act like and socialize with those who are similar to them and those with whom they engage most frequently (Berger & Rodkin, 2012; Berger & Diikstra, 2013; McPherson, Smith-Lovin, & Cook, 2001). Researchers also have found similar results when examining the impact tracking systems have on racial integration (Moody, 2001) and social cliques (Hallinan & Smith, 1989). Additionally, Schaefer et al. (2011) found that academic track had a significant effect on participation in extracurricular activities and that participation in extracurricular activities significantly impacted the probability of friendships (i.e., social networks) to develop. All of these factors have the potential to significantly impact social networks of adolescents with disabilities; however, this relationship has not been explored in the research literature.
Byrne (1988) suggests that without systematic attention to the impact of tracking, adolescents with disabilities are likely to continue to experience limited social networks. While some have argued that schools have been detracked, there are certainly existing social and organizational structures that continue to track students based on ability within modern schools (Frank, Muller, & Mueller, 2013). For example, in a case study of 6 schools (over a three year period) who were going through the America’s Choice small school reform effort, Harris (2011) found schools continued to engage in institutionalized tracking despite reforms and that administrators across schools indicated that eliminating tracking, as an institution, was far more difficult than they had anticipated. Academic tracking continues to be a practice institutionalized within high schools and may provide a clearer understanding of both students’ support needs and the placements that influence access to peer social networks.

**Social Capital and its Relationship to Valued Life Outcomes**

Self-advocates, families, and others in the disability field value the importance of social connections and social network membership. The recognition of social networks as valuable to the individual embodies the shift in the disability field from simply promoting physical access to inclusive environments to a social-ecological model where support needs in inclusive environments are the focus, with an emphasis on promoting valued life outcomes (e.g., quality of life; Lefort & Fraser, 2002; Sands & Koleski, 1994; Schalock, 2004). In fact, advocates argue that social inclusion is not just an inherent right for all individuals (Americans with Disabilities Act, 1990; Convention on the Rights of Persons with Disabilities, 2006; Individuals with Disabilities Education Act of 1997) but that social inclusion has a significant, positive impact on an individual’s economic well-being (Zhang, Anderson, & Zhan, 2011), health (Perry &
Pescosolido, 2010; Poortinga, 2006), education (Israel, Beaulieu, & Hartless, 2001; Morgan & Sorensen, 1999), vocational outcomes (Helliwell, 2001), independent living (White, Simpson, Gonda, Ravesloot, & Coble, 2010), and leisure pursuits (Portes, 1998).

The emphasis on equal access to environments led to legislation guaranteeing inclusion across many life domains (e.g., Americans with Disabilities Act, 1990; Developmental Disabilities Assistance and Bill of Rights Act of 2000; Olmstead Act of 2008; Rehabilitation Act of 1973). Particular to schools, the Education of All Handicapped Children Act of 1975 (renamed the Individuals with Disabilities Education Act) legislated that public schools provide equal access to education for students with disabilities in the least restrictive environment. Over nearly 39 years, students with disabilities have experienced increased access to general education classrooms and schools with their typically developing peers; although all too often this access remains limited particularly for students with the most severe disabilities (U.S. Department of Education, Digest of Education Statistics, 2013). Even when students with disabilities are included in general education classrooms, researchers find students with disabilities continue to experience social isolation as evidenced by (a) lack of participation in social activities and opportunities for social interaction in classrooms (Farmer, Estell, Leung, Trott, Bishop, & Cairns, 2003; Hogan, McClellan, & Bauman, 2000) and (b) peripheral membership in peer social networks (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Farmer, Leung, Weiss, … & Hutchins, 2011; Pearl, Van Acker, Rodkin, … & Henley, 1998). In fact, the risk for community segregation, isolation, and loneliness for adolescents with disabilities is very real. The lack of effective and efficient supports for social network development can make it especially difficult for students with disabilities to establish, build, and maintain strong social relationships (Downing, 2005; Thompson, Bradley, Buntix, … Yeager, 2009) and to participate in formal and
informal social activity, a key component of the development of social networks for adolescents with and without disabilities. This necessitates further analysis of the individual and institutional factors that impact peers relationships and participation in formal and informal social activities.

**Participation in formal and informal social activities.** While there are many valued life outcomes that social capital can enhance (e.g., employment, academic achievement, prosocial behavior), participation in formal and informal social activity is particularly important for adolescents as they spend a majority of their time engaging in leisure activities with friends and research has shown that access to and participation in social activities influences social capital (Bartko & Eccles, 2003; Larson & Verma, 1999; Putnam, 2000). Researchers have begun to examine the impact ego network characteristics have on the social activities in which egos participate. Adolescence is a time where adolescents begin to move away from the guidance and care of their parents, gain more independence in their own activities, and become increasingly under the influence of peers for most life domains (e.g., education, leisure, social activity, health, employment). Research has indicated that engagement in social activities with peers is important because it is in these activities where social connections are strengthened and new connections are made. Particularly, adolescents participate in activities with peers with whom they are connected (Kandel, 1978) and the dynamics of those social connections (i.e., social networks) can impact how much influence a peer group has over the individual (Brown, Bakken, Amerigner, & Mahon, 2008). Engagement in social activity is also important because it is related to improved mental health outcomes (Barber et al., 2001), academic achievement (Marsh, 1992), and other prosocial behaviors and activities (Eccles & Bartko, 2003).

Adolescents engage in both formal and informal social activities (Eccles & Bartko, 2003). Informal activities are unstructured and occur outside of formal organizational structures
whereas formal social activities are highly structured and involve an institution organizing and housing the social activity for a particular purpose (e.g., art club, baseball team, volunteer cleanup; Schaeffer et al., 2011). Both are highly relevant for adolescents and research has shown that ego network structural characteristics (i.e., network size, density, effective size, and efficiency) may explain differences in engagement in social activity above and beyond what can be explained by individual (i.e., demographic characteristics, crowd membership, ICT use) or institutional factors (i.e., academic tracking).

**Informal social activity.** There is some evidence that closeness, reciprocity, and communication technology impact the social activities in which egos participate (Carrasco & Miller, 2006; Hogan, Carrasco, & Wellman, 2007). Research also suggests that information communication technology (ICT) use (e.g., email, texting, social media) helps individuals form and expand ego networks (Carrasco & Miller, 2006; Crosier, Webster, & Dillon, 2012; Hogan, Carrasco, & Wellman, 2007). However, it is not well understood how an adolescent’s ego network ties or information communication technology use, a very influential means of communication for adolescents (Reich, Subrahmanyan, & Espinoza, 2012), may impact their involvement in social activities with network members. It is also not well understood how adolescents with disabilities engage in informal social activities.

**Formal social activity.** Ego network researchers have examined the relationship between ego networks and social activity (Carrasco, et al., 2008; Schlich, Schoenfelder, Hanson, & Axhausen, 2004). Disability researchers also have examined adolescent involvement in school-based and home-based social activities (Bartko & Eccles, 2003; Almqvist & Granlund, 2005) as well as the intensity of formal and informal activities outside of school obligations (King, Law, King, … Young, 2004; King, McDougall, DeWit, Hong, Miller, Offord, et al., 2005).
Examination of participation in school-related and out-of-school activities for adolescents with disabilities has involved individual characteristics as well as other ecological system factors that exert an influence on participation. For instance, age, gender, ethnicity, and exosystem factors (e.g., environmental supports, parent schedules) are significant participation predictors for children with physical disabilities (e.g., spinal cord injury, cerebral palsy; King, Petrenchik, Dewit, … Law, 2010). Researchers also have found that adolescents with disabilities and their parents report less participation in extracurricular or school-related activities than parents of adolescents without disabilities across a variety of disability levels and support needs (Coster, Law, Bedell, … & Teplicky, 2013; King, Petrenchik, Dewit, … & Law, 2010). While variability in involvement in social activities by adolescents with disabilities exists, the literature suggests that psychosocial skills (e.g., peer problems, prosocial behavior) may moderate social activity (Bartko and Eccles, 2003; King, Petrenchik, Dewit, … & Law, 2010). Ego network characteristics, or peer social connections, may also explain participation in social activities beyond psychosocial demographic characteristics. Thus, this body of research suggests, as described in the social capital model (Figure 2.2), that personal and institutional factors exert an influence over social networks, which then impacts access to social capital and participation in formal and informal social activities, activities that are highly relevant for adolescents and their development of social capital.

Conclusions

Social connections are a form of social capital that are highly valuable resources for adolescents. This resource can be used as an investment (creating and maintaining social connections) and as a means of obtaining resources (getting advice or assistance from a social connection) or making gains or getting ahead (utilizing a social connection as a reference for a
new job). In this Chapter, a social capital model was introduced, one in which capital flows through social networks, which in turn can impact valued life outcomes, including social activities. This was followed by a discussion of how social capital is theorized and measured as whole and ego network analyses to explain the necessity of systematic measurement of ego networks. Different forms of social capital available to adolescents, focusing on peer relationships, and individual and institutional factors that can influence the development of these relationships and the building of social capital were examined. The Chapter ended with the examination of how informal and formal social activities shape relationships and social capital development.

My goal in bringing together these diverse lines of research was to establish an empirical basis for my social capital model (Figure 2.2) and to provide a context for why testing the relationships specified in this model is a critical next step in social capital research. The ego networks of adolescents with disabilities have rarely been examined, and even more rarely have the personal and institutional factors that influence membership and social activities been empirically explored. Therefore, the purpose of the proposed study was to examine (a) differences in the ego network structural characteristics of adolescents with and without disabilities among academic tracks and (b) how those network characteristics influenced social activity. Individual and institutional factors that are hypothesized to impact social connections were examined, most notably placement into an academic track (e.g., inclusive vs. segregated placements) that serves as a proxy for disability label and support needs. Specifically, I was interested in (a) differences in ego network structural characteristics for adolescents with and without disabilities across academic tracks; (b) individual characteristics that predict the ego network structural characteristics of adolescents, (c) the relationship between academic track and
ICT use and participation in informal and formal social activity, and (d) the degree to which individual characteristics, ego network structural characteristics, and ICT use predicted differences in the frequency of engagement in informal and formal social activities. Specifically, the following research questions were addressed:

1. How do high school students’ ego network structural characteristics (i.e., size, density, effective size, efficiency) differ across academic tracks specified by the school system (i.e., general education classroom placement, co-taught general/special education classroom placement; or segregated special education classroom placement)?

2. What is the relationship between student characteristics (i.e., gender, grade, race/ethnicity, academic track) and students’ ego network structural characteristics (i.e., size, density, effective size, efficiency)?

3. What is the relationship between academic track and information communication technology usage?

4. What is the relationship between academic track and a student’s participation in home or school social activities?

5. What factors (i.e., student characteristics, network size, and information communication technology use) predict frequency of informal and formal social activities?
Chapter 3

Methods

In the following sections, I describe the methods used to answer the research questions presented at the end of Chapter 2. First, I describe the study sample followed by the recruitment and sampling procedures used to generate the sample. Next, I describe the research design, including the independent and dependent variables examined; data collection procedures; and data management. Finally, the data analysis section provides information on the analytic procedures used, organized by the five research questions.

Sample Demographics

Using the procedures described in the following sections, I sampled a total of 350 students across three academic tracks (i.e., general education placement, \( n = 141 \); co-taught placement, \( n = 116 \); special education placement, \( n = 40 \)) in two high schools. A total 297 high school students ultimately completed the survey (response rate = 84%). Fifty-three students did not assent to participate (GENED = 13; Co-taught = 27; SPED = 11). Two students in the special education track were unable to complete the survey due to survey demands not matching their support needs.

An overview of the demographic characteristics of the 297 student participants is provided in Table 3.1. Of the 297 students who responded, 43% were female and there was diversity in age, grade, race/ethnicity, and crowd membership. The distribution of students across racial and ethnic groups and academic tracks closely resembled that of the two schools (described subsequently), their representative districts, and the mid-western state where both schools reside. For instance, students in the special education academic track accounted for 14% of the sample, congruent with percent of students served by the schools and in the state.
So, while the sample included in the special education academic track was less than that of co-taught or general education track, this was an expected occurrence. The representativeness of the sample assists in extrapolating the findings to the greater school population.

Table 3.1

Demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>Factors</th>
<th>n</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>170</td>
<td>57%</td>
</tr>
<tr>
<td>Female</td>
<td>127</td>
<td>43%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 years</td>
<td>92</td>
<td>31%</td>
</tr>
<tr>
<td>15 years</td>
<td>75</td>
<td>25%</td>
</tr>
<tr>
<td>16 years</td>
<td>35</td>
<td>13%</td>
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<td>17 years</td>
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<td>23%</td>
</tr>
<tr>
<td>18 years</td>
<td>26</td>
<td>9%</td>
</tr>
<tr>
<td>21 years</td>
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<td>&lt;1%</td>
</tr>
<tr>
<td>Grade</td>
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<td></td>
</tr>
<tr>
<td>Missing</td>
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<td>&lt;1%</td>
</tr>
<tr>
<td>9th grade</td>
<td>158</td>
<td>53%</td>
</tr>
<tr>
<td>10th grade</td>
<td>25</td>
<td>8%</td>
</tr>
<tr>
<td>11th grade</td>
<td>36</td>
<td>12%</td>
</tr>
<tr>
<td>12th grade</td>
<td>77</td>
<td>26%</td>
</tr>
<tr>
<td>Ethnicity</td>
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<td>1%</td>
</tr>
<tr>
<td>Asian</td>
<td>11</td>
<td>4%</td>
</tr>
<tr>
<td>Black</td>
<td>67</td>
<td>23%</td>
</tr>
<tr>
<td>Hispanic/Latina/Latino</td>
<td>41</td>
<td>14%</td>
</tr>
<tr>
<td>White</td>
<td>141</td>
<td>48%</td>
</tr>
<tr>
<td>Multiracial</td>
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<td>11%</td>
</tr>
<tr>
<td>Academic track</td>
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<td></td>
</tr>
<tr>
<td>SPED</td>
<td>40</td>
<td>14%</td>
</tr>
<tr>
<td>GENED</td>
<td>141</td>
<td>48%</td>
</tr>
<tr>
<td>Cotaught</td>
<td>116</td>
<td>39%</td>
</tr>
<tr>
<td>Crowd membership</td>
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<td></td>
</tr>
<tr>
<td>Popular</td>
<td>15</td>
<td>5%</td>
</tr>
<tr>
<td>Jock</td>
<td>8</td>
<td>3%</td>
</tr>
<tr>
<td>Brain</td>
<td>6</td>
<td>2%</td>
</tr>
<tr>
<td>Normal</td>
<td>140</td>
<td>47%</td>
</tr>
<tr>
<td>Tough</td>
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<td>3%</td>
</tr>
<tr>
<td>Outcast</td>
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<td>4%</td>
</tr>
<tr>
<td>None</td>
<td>23</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>21</td>
<td>7%</td>
</tr>
<tr>
<td>Brain/Normal*</td>
<td>31</td>
<td>10%</td>
</tr>
<tr>
<td>Jock/Normal*</td>
<td>32</td>
<td>10%</td>
</tr>
<tr>
<td>Did not respond</td>
<td>4</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Note: *Students indicated membership in two crowds (i.e., brain and normal; jock and normal).
Recruitment and Sampling Procedures

Recruitment procedures. Large, suburban, public high schools in a Midwestern state were recruited. Because I was interested in the ego networks of students with and without disabilities, only public high schools where students with disabilities are guaranteed a free and appropriate public education (FAPE) in the least restrictive environment under the Individuals with Disabilities Education Act (IDEA, 2004) were recruited. Publicly funded special education schools were not eligible to participate because only students with disabilities attend these schools. Publicly funded charter schools were also not eligible as the U.S. Government Accountability Office has indicated that students with moderate to severe disabilities do not have the same access to these schools as their same-age peers (U.S.G.A.O, June, 2012). Finally, private schools were not eligible to participate because these schools are not mandated by the IDEA (2004) to provide educational services for students with disabilities.

Because previous research has examined the social networks of rural students with and without disabilities (Farmer et al., 2011; Israel et al., 2001), and because of my interest in social networks in metropolitan areas, I targeted recruitment to suburban metropolitan public school districts following the locale codes designated by the National Center for Education Statistics (NCES, 2006). Specifically, I contacted personnel at schools within districts that serve city-small, city-midsize, and suburb-large communities in a large Midwestern state. City-small communities are defined as a “territory inside an urbanized area and inside a principal city with a population less than 100,000.” (Snyder, Dillow, & Hoffman, 2007). City-midsize communities are those whose boundaries “… are inside an urbanized area and inside a principal city with a population less than 250,000 and greater than or equal to 100,000” (Snyder, Dillow, & Hoffman, 2007). Suburb-large communities are identified as a “territory outside a principal city and inside
an urbanized area with a population of 250,000 or more” (Snyder, Dillow, & Hoffman, 2007). In the interest of making the findings generalizable to similar metropolitan communities, schools in districts serving rural communities were not eligible to participate.

After IRB approval was obtained, I contacted by email Directors of Special Education and/or Directors of Research in 15 school districts meeting the aforementioned criteria and inquired about their interest in participating. The email included information about the study and a recruitment flyer (Appendix A). If district personnel did not respond within 4 business days of the initial email, the email was resent. If, again, district personnel did not respond, I telephoned the district contact up to two times to invite the district to participate. If the district still did not respond, the district contact was sent one final email. If, at that point, a response was not received, I assumed the district did not want to participate and ceased contact.

Out of the 15 districts initially contacted, 2 did not respond, 9 declined, and 4 agreed to participate. Two districts participated in a different study in which the ego network structural characteristics questions were piloted to determine whether adolescents were able to answer them and how long the questions took to answer. These results were used to inform the procedures for the present study. The remaining two districts that expressed initial interest ultimately withdrew their participation because of competing demands on their time due to restructuring occurring in the school district. At this point, I reached out to general education and special education teachers through professional networks. These efforts proved successful as I recruited three high schools in city-midsize communities to participate. Ultimately, two high schools in two separate school districts contributed data to the present study. The third school that expressed an interest in participating did not complete data collection at the time of the writing of this dissertation. These data will be included in a replication study.
High school demographics and policies. The two participating high schools were located in school districts the suburbs of a large Midwestern city. In keeping with confidentiality, I assigned each school a pseudonym that in no way reflects the location or characteristics of either high school or their respective districts. The first high school is named Hinman High School. The second school is named Judson High School. Table 3.2 provides racial/ethnic, economic, and academic information for Hinman and Judson High Schools and the state.

Table 3.2

<table>
<thead>
<tr>
<th>School</th>
<th>Racial/Ethnicity</th>
<th>SES</th>
<th>Academics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As.</td>
<td>A.I.</td>
<td>Bl.</td>
</tr>
<tr>
<td>Hinman</td>
<td>15%</td>
<td>0.3%</td>
<td>14%</td>
</tr>
<tr>
<td>Judson</td>
<td>2%</td>
<td>0.3%</td>
<td>6%</td>
</tr>
<tr>
<td>State</td>
<td>4%</td>
<td>0.3%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Note. Source (REDACTED). As. refers to the percentage of students of Asian descent. A.I. refers to the percentage of students of American Indian descent. Bl. refers to the percentage of students of Black descent. Hisp. refers to the percentage of students of Hispanic descent. Multi. refers to the percentage of students identified as multiracial. Wh. refers to the percentage of students of White descent. L.I. refers to the percentage of students from low-income backgrounds. Families from low-income backgrounds refers to “families receiving public aid, living in institutions for neglected or delinquent children, being supported in foster homes with public funds, or eligible to receive free or reduced-price lunches” (retrieved from: (REDACTED). IEP refers to the percentage of students with Individualized Education Programs. LEP refers to the percentage of student identified as English Language Learners. State Test refers to the percentage of students who meet or exceed state standards as measured by the REDACTED State Achievement Examination and the (REDACTED)Alternate Assessment.

Each district had specific academic tracking policies that were nearly identical. Each district’s curriculum guide (Redacted, 2012) describes academic tracks used to place students with and without disabilities into core academic classes. As shown in Table 3.3, these academic tracks are defined both by the curriculum that students have access to (e.g., functional, intensive instruction linked to the general education curriculum, general education core content), as well as the classrooms within which students are placed (e.g., special education functional classroom, special education remedial classroom, general education classroom).
Table 3.3

<table>
<thead>
<tr>
<th>Level</th>
<th>Study term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Special education</td>
<td>Course builds and strengthens “basic fundamentals, skills, and concepts” (p.9). District staff described this curriculum as “functional.”</td>
</tr>
<tr>
<td>1</td>
<td>Special education</td>
<td>Course provides students with entire curriculum with a focus on improving student skills. District staff described this curriculum as “instructional.”</td>
</tr>
<tr>
<td>2 – 6</td>
<td>General education</td>
<td>“Regular education course” available to all students including those entering “advanced education or training programs after education” (p. 9).</td>
</tr>
<tr>
<td>7</td>
<td>Co-taught</td>
<td>Co-taught classes are available to students with and without disabilities and are taught by both a general education and special education teachers.</td>
</tr>
<tr>
<td>8</td>
<td>Accelerated</td>
<td>Honors courses which provide intensive and fast-paced learning</td>
</tr>
<tr>
<td>9</td>
<td>AP</td>
<td>Advanced Placement and Honors courses; college credit available in Advanced Placement courses</td>
</tr>
</tbody>
</table>

*Source: Redacted Curriculum Guide (2012). For the purposes of this paper, we have named Levels 0-1 as special education classes (SPED), Level 7 as co-taught (Co-taught) and all other tracks as general education (GENED; levels 2-6, accelerated, AP).*

**Hinman High School.** Hinman High School is located within a city-midsize community in a suburb of a large metropolitan Midwestern city. The district in which Hinman resides serves approximately 29,000 students in grades pre-k – 12th. There are approximately 30 schools with three large high schools and two smaller alternative high schools. Given that the district serves four towns/cities/villages, the district student body is diverse ethnically/racially, socioeconomically, and academically.

In terms of Hinman, specifically, it is a large high school within the district serving approximately 2,600 students. Hinman students are more diverse than the district population and more closely reflect state diversity in terms of ethnicity, socioeconomic status, and academic progress. As compared with the state student population, Hinman serves similar numbers of White students, fewer Black and Hispanic students, and slightly more Asian students. Additionally, Hinman High School has fewer students identified as low-income and English Language Learners, similar numbers of students with IEPs, and larger numbers of students who meet or exceed state standards. Table 3.2 provides specific data on the Hinman High School
student population as compared with Judson High School (described next) and the state student population.

*District programming.* As described previously, the district offers different academic tracks for students with and without disabilities through a district-wide academic tracking policy that places students into academic paths for core academic courses (i.e., English, Math, Science, Social Studies). The district uses a combination of standardized placement tests and teacher recommendations, conducted in 8th grade, to place students within specific academic tracks prior to entering the high school. Parents, however, can petition to have their child moved to a different track. Additionally, students are able to transfer to different tracks during high school based on academic performance and teacher recommendations. Special education only (levels 0 and 1, Table 3.3) placements consist of functional and instructional level courses that occur in classrooms that only serve students with disabilities. Functional level courses emphasize basic skills needed to succeed in life while instructional level courses follow the standard district curriculum (e.g., Biology, Reading, Social Studies) but provide a smaller class size with more support. All students in the special education track have Individualized Education Programs (IEPs). Co-taught content area courses (e.g., Biology, Chemistry, Algebra, U.S. History) are listed as general education courses for college-bound students. Approximately 30% of students in co-taught track classes have IEPs. These classes are co-taught by a general education teacher certified in the subject area and a special education teacher; both Judson and Hinman use a one-teach (general education teacher), one-support model (special education teacher). Students with disabilities in co-taught classes typically only receive accommodations (e.g., having tests read aloud) and in some cases, limited modifications (e.g., pre- and re-teaching of material, note-taking strategies).
According to the districts, students without disabilities are randomly assigned to co-taught or general education classes. General education classes are college-bound courses that are taught by a certified general education teacher. The districts also offer accelerated courses and AP courses where the material is more challenging and presented at a quicker pace where students are expected to be more independent. According to district staff, students with disabilities are eligible for general education and accelerated level courses if their support needs are not such that they would require daily, in-class support from a special education teacher. Approximately 5% of students in the general education track have IEPs. Each track is identified in the school course code by subject, grade level, and academic track. For instance, E301 designates English (“E”) for juniors (“3” – indicating third year) in Level 1 (“1”) “0” is a placeholder and consistent across all classes and grades; one stands for Level 1).

**Judson High School.** Judson High School is also located within a city-midsize community in a suburb of a large metropolitan Midwestern city. The district in which Judson High School resides serves approximately 8,000 students, in grades 9-12, across 5 suburban communities.

Judson high school is a large school serving a diverse student population (approximately 2,400 students). The student population is less diverse ethnically (78% White) than Hinman High School but is more socioeconomically diverse (31% low-income) and fewer students meet or exceed the state standards (59%). The population of English Language Learners (4%) and students with IEPs (13%) aligns more close with those at Hinman High School.

**District programming.** Judson’s district academic tracking policy is similar to Hinman’s district. Students are tracked, in 8th grade, into AP (Judson’s district only has AP, not accelerated and AP), general education, co-taught, or special education instructional or functional classes.
Judson High School considers multiple factors to determine appropriate student placement of students with disabilities. Per district policy, students with a 4th grade reading level or lower are automatically placed into courses labeled as instructional or lower. Functional level courses follow a life-skills curriculum tied to district goals and are for students with the most intensive support needs.

**Sampling.** In order to obtain a representative sample at each high school, I used specific sampling procedures across academic tracks. Academic tracks were defined as special education (instructional and functional), co-taught, and general education (general education and accelerated/AP levels). The academic tracks were defined in this manner based on the service delivery model and the level of inclusiveness within each track. The special education grouping was created based on the service delivery model of segregated classrooms. The contact teachers reported that students in the SPED track had a variety of different disabilities including learning disabilities, behavior disorders, other health impairments, autism, and intellectual disability. In co-taught classes, students with mild to moderate disabilities were in inclusive classes and received instruction from both general and special education teachers. Finally, general education and accelerated levels (GENED) were combined because, when students are placed in these tracks the special education delivery model is a consult model with special education teachers checking in with general education teachers and/or students with disabilities on an as needed basis.

The contact teachers at each school (who were both special education teachers) indicated that for some students with disabilities the determination of an academic track, particularly the choice between instructional level (SPED) versus a co-taught level depended on the student, the teacher’s perceptions of student capacities, and the parent’s advocacy. This suggests that while
academic track serves in many ways within these schools as a proxy for support need; other factors also influence placement in a given track.

I used a stratified convenience sampling procedure to generate a representative sample from SPED, Co-taught, and GENED tracks (a priori power analysis – described subsequently – required 180 students total). The contact teacher at each school assisted with recruiting classes across academic tracks. Across both schools, at least three core content area classes across the three academic tracks were sampled. I required that the class be a core content area (i.e., English, Math, or Science) because all students are required to take these courses. As not all students are required to take electives or take the same electives, surveying students in these courses may not have provided the student diversity needed. Table 3.4 provides information on the number of classes and students sampled across tracks.

Table 3.4

<table>
<thead>
<tr>
<th>Sampling</th>
<th>Hinman</th>
<th>Judson</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classes (n)</td>
<td>n (Students)</td>
</tr>
<tr>
<td></td>
<td>SPED</td>
<td>Func. Rdg. (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inst. Eng. (1)</td>
</tr>
<tr>
<td></td>
<td>Co-taught</td>
<td>English (3)</td>
</tr>
<tr>
<td></td>
<td>GENED</td>
<td>Biology (3)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>148</td>
</tr>
</tbody>
</table>


I chose to sample three classrooms per academic track (e.g., SPED, co-taught, GENED) in an effort to oversample the student population with the understanding that some parents may not provide consent, some students may not assent to participate, or some students may not be available during the surveying time (e.g., absent, testing). I chose this sampling method rather than survey the entire population given the amount of data that could reasonably be collected with the available resources and within the identified time frame. Because students with disabilities comprised 13% of the student population at Judson and Hinman, there were fewer
classrooms and students to sample within the SPED track, leading to smaller numbers of students in these cells; however, power analysis suggested there was still sufficient power to detect effects.

**Consent.** In agreement with district/school staff and the university IRB, I used a waiver of informed consent and student assent procedures (see Appendix B). A parental waiver of informed consent is granted when the study presents minimal risk and requires high participation rates from diverse populations. Since previous research suggests parents of higher socioeconomic status consent at a higher rate than parents of students with lower socioeconomic status (Hollmann & McNamara, 1999), without this waiver, the findings may have been less valid as parents of students from diverse backgrounds might not have responded to the request for consent.

Under the waiver of informed consent procedures, parents of students in recruited classes received a waiver of informed consent letter one week prior to the survey administration. The letter described the study in detail and provided parents with the option to decline their child’s participation. The waiver letters were sent home through previously established home/school communications (e.g., paper copies, daily electronic communications, weekly newsletter, parent listserv). Ultimately, three parents at Hinman and one parent at Judson declined their child’s participation.

The Judson contact teacher indicated that some parent needed a Spanish version of the waiver of informed consent. A Spanish translation of the waiver of informed consent was sent to these parents. All students read and wrote in English so a Spanish translation of the student assent and the survey was not necessary.

Voluntary informed student participation was insured by obtaining the student’s assent at
the start of the testing session and by asking teachers to monitor student behavior as students completed the survey. On the day the survey was administered, teachers first read students a script that described the study (Appendix B). Students were then given an assent letter to read (Appendix C). Students indicated their assent to participate on this form. Students who did not assent did not complete a survey. Teachers were asked to monitor students who did assent as they completed the survey and if they observed student behaviors that indicated the student no longer wished to participate (e.g., looked uncomfortable, looked around or distracted, crumpled up paper), they were asked to offer the student an opportunity to end their participation in the survey. Students were able to cease completing the survey without any consequence. The surveys are described in the next section and are located in Appendices D-F.

**Research Design**

I used a cross-sectional design, gathering data at a single point in time, late in the first semester and early in the second semester of the 2013-2014 academic year. The collected data were analyzed, for students with and without disabilities (through the academic track), based on the five research questions described at the end of Chapter 2. Specifically, I examined in how the structural characteristics of ego networks of adolescents with and without disabilities differed across academic tracks (Research Question 1). Next I examined the degree to which various individual and institutional factors (i.e., gender, grade, race/ethnicity; academic track, crowd membership) predicted ego network structural characteristics (i.e., network size, density, effective size, efficiency) (Research Question 2). Building on this model, I analyzed whether there were differences in ICT use (Research Question 3) and informal and formal social activity (Research Question 4) by academic track. Finally, I combined the results from the previous analyses and examined the degree to which (a) individual and institutional factors, (b) structural
ego network characteristics, and (c) Information Communication Technology use predicted student involvement in formal and informal social activities, a proxy for social capital.

**Independent and Dependent Variables.** Table 3.5 provides information on the independent and dependent variables for each research question, which are described further in the following sections.

Table 3.5

<table>
<thead>
<tr>
<th>Independent and Dependent Variables Description</th>
<th>Variables</th>
<th>Description</th>
<th>Research questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>Ego network structural characteristics</td>
<td>Number of network members</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>Density</td>
<td>Connectedness among ego’s network members; number of ties among alters present, out of total possible alter ties</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>Effective size</td>
<td>Number of non-redundant ties with alters</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>Efficiency</td>
<td>Percentage of non-redundant ties</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>ICT use</td>
<td>Used ICT mode (landline, cellphone, email, texting) to communicate with friends</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engaged in social activity</td>
<td>Engaged in social activity (informal and formal) with friends</td>
<td>4</td>
</tr>
<tr>
<td>Frequency of social activity engagement</td>
<td>Informal</td>
<td>Frequency of social activity with friends at home or at friend’s house</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Formal</td>
<td>Frequency of social activity in school-sponsored activities/events</td>
<td>5</td>
</tr>
<tr>
<td>Independent variables</td>
<td>Student-level factors</td>
<td>Male, female</td>
<td>2, 5</td>
</tr>
<tr>
<td></td>
<td>Race</td>
<td>Asian, American Indian, Black, Hispanic, White, Multiracial</td>
<td>2, 5</td>
</tr>
<tr>
<td></td>
<td>Grade</td>
<td>9, 10, 11, 12</td>
<td>2, 5</td>
</tr>
<tr>
<td></td>
<td>Academic Track</td>
<td>SPED, Co-taught, GENED</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td></td>
<td>Crowd membership</td>
<td>Popular, Jock, Brain, Normal, Tough, Outcast, None, Other/Specify, Brain/Normal, Jock/Normal</td>
<td>2, 5</td>
</tr>
<tr>
<td></td>
<td>Ego network size</td>
<td>Number of network members</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>ICT use*</td>
<td>Used this ICT to communicate with friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cellphone</td>
<td>Yes/no</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Texting use</td>
<td>Yes/no</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note: *Only cellphone and texting were included in Question 5 as Question 2 indicated that landline and email were not ICT modes used by students across academic tracks.

Dependent variables. The dependent variables for Research Questions 1 and 2 were ego network structural characteristics (i.e., size, density, effective size, efficiency), for Research
Question 3 ICT use, and for Research Questions 4 and 5 participation in informal and formal social activities (frequency of home- and school-based social activities), which was a proxy for social connection and capital. Ego network data were collected using the procedures described in *The Social Network Map* (SNM) and *The Social Network Grid* (SNG; Tracy & Whitaker, 1990).

_Ego network structural characteristics._ As indicated in Chapter 2, ego network analysis focuses on the ego (person or organization) and the relationships (i.e., ties) an ego has with alters (i.e., network members). While there are many aspects of ego networks to analyze, my research questions focused on network structural characteristics (e.g., size, density, effective size, and efficiency). Size and density (i.e., alter-alter connectedness) indicate the breadth of an ego’s personal network as well as how constrained the ego is to his/her network (Marsden, 1993, 2002; Wellman & Leighton, 1979). Effective size and efficiency are measures based on Burt’s structural holes theory (1992; 2000). As discussed in Chapter 2, structural holes theory suggests that structural holes (places in the network where alters are not tied to other alters, except through the ego) provide the ego with novel information and enable the ego to transfer novel information from one network to the next (i.e., bridging). Effective size and efficiency are important measures because they represent the impact the ego has on network members which is a sign of bridging or brokering social capital (i.e., does the ego utilize the ties to transfer novel information to improve his/her status).

Ego network data is elicited through name generators, name interpreter, and alter-alter questions (Carolan, 2014; Hanneman & Riddle, 2009; Wasserman & Faust, 1994). Specifically, each ego (i.e., student) identifies the (a) members of their personal network (i.e., name generator question), (b) nature of the relationship between ego and alter (i.e., name interpreter question), and (c) relationships, present or not, among listed alters (alter-alter relationships). I modified two
established tools, *The Social Network Map* (SNM) and *The Social Network Grid* (SNG; Tracy & Whitaker, 1990) to collect ego network data. These tools have been used in the ego network literature focused on youth without disabilities (Blakeslee, 2012; Lau-Barraco & Collins, 2011) and on youth and young adults with disabilities (Bigby, 2012; Hulbert-Williams, et al., 2011; Kef, Hox, & Habekothe, 2000; Robertson et al., 2007).

The Social Network Map (SNM; Tracy & Whittaker, 1990) provides a structured methodology to elicit ego-alter relationships. While Tracy and Whittaker’s SNM gathers ego network data on eight sectors of the ego’s life, I limited the focus to those sectors in which peers have the greatest likelihood to be located: friendship groups, classes, clubs/organizations, a teacher, and a neighbor. Students were instructed to freely list the peers “with whom they hang together a lot” or who “have been important to” them (e.g., provided support emotionally, academically). Students were instructed that there was no right or wrong answer and that they could list only first names. Summing all peers listed constituted the ego’s network size.

For each alter listed, students were be asked a series of questions that elicited network structural characteristics. I designed the following questions using the Social Network Grid framework (Buysse, et al., 1997; Tracy & Whittaker, 1990). First, students indicated the characteristics of each alter listed. Alter characteristics were (a) gender, (b) grade, (c) ethnicity, (d) disability/no disability, (e) how they know this alter, (f) how often they see this alter, (g) how close they feel to this alter, (h) how long they have known each other, (i) whether the named alter is friends with other listed alters, and (j) to which alters the named alter is connected (Kef, Hox, & Habekothe, 2000; van Asselt-Goverts, Embregts, & Hendriks, 2013). For each alter named, students identified alter-alter relationships (density). Density was identified by asking students the following question: “List the names of the friends this person is friends with.” If a student did
not understand the question, the survey administrator was instructed to say “Please indicate below, the friends who would talk to one another or hang out together when you are not around.”

*Social activity data measure.* After sharing demographic information and egocentric network data, students were also asked to indicate their participation in informal and formal social activities, which served as a proxy measure of social connection and capital. For informal social activities, participants indicated the frequency per week and number of friends with whom they hang out at home or at their friend’s house. For formal social activities, students indicated the frequency per week and the number of friends with whom they participate in school-sponsored activities (e.g., clubs/organizations, dances, sports games, plays). Clubs/organizations were defined as any extra-curricular school-sponsored activities in which the student participates (e.g., newspaper club, photography club, vegetarian club, Amnesty International group). Figure 3.1 provides the social activity questions included in the student survey.

Figure 3.1

*Social Activity Questions*

*In the following questions, we want to know about the social activities in which you participate.*

1. With how many friends do you hang out at your house or a friend’s house?

________________

2. How many times per week do you hang out at your house or a friend’s house?

________________

3. With how many friends do you hang out with at school activities (e.g., school clubs, activities)?

________________

4. How many times per week do you hang out with your friends at school activities (e.g., school clubs, team sports)?

________________
Independent variables. The independent variables were variables that, based on the review of the literature in Chapter 2, I hypothesized would influence ego network structural characteristics (Research Questions 1 and 2); ICT use (Research Question 3) and social activity involvement (Research Questions 4 and 5). The independent variables differed across research questions and included individual and institutional factors (i.e., gender, grade, race/ethnicity, academic track, crowd membership), ego network structural characteristics (described previously as they served as an independent and dependent variable), and ICT use.

Individual and institutional factors. Student academic track was provided to researchers by school staff and used to stratify the sample. All other information was collected directly from students. Students provided information on their (a) gender, (b) age, (c) race/ethnicity, (d) grade, and (e) crowd membership. First, students identified, from a predetermined list, their gender (male/female), grade (9/10/11/12), and race/ethnicity (Asian/ American Indian/Black/Hispanic/Multiracial/White) based on categories used by the school districts. Next, students identified the crowd to which they belong. Students selected, from a predetermined list, as many of the seven available crowds identified in the literature (i.e., popular, jock, brain, normal, tough, outcast, none, or other) or specified a choice by stating other and naming the crowd with which they affiliated (Ryan, 2000).

Information communication technologies (ICT). Students also were asked the frequency and number of friends (network members) with whom they used the following ICT modes (Carrasco & Miller, 2006): (a) call by landline, (b) call by cellphone, (c) email, and (d) texting. Specifically, students were asked the following questions:

1. List the number of friends you call using a landline: once per month, once per week, several times per week, once per day, several times per day.
2. List the number of friends you call using a cellphone: once per month, once per week, several times per week, once per day, several times per day.

3. List the number of friends you contact through email: once per month, once per week, several times per week, once per day, several times per day.

4. List the number of friends you contact through texting: once per month, once per week, several times per week, once per day, several times per day.

Sample Size

Using GPower3.1 (Faul et al., 2009), I conducted a-priori power analyses to determine the necessary sample size based for each question. These sample size estimates guided the sampling plan described previously.

To analyze the data related to Research Question 1, I estimated the sample size needed to conduct four separate one-way ANOVAs to determine the amount of variance in (a) network size, (b) density, (c) effective size, and (d) efficiency explained by the three academic tracks (SPED, Co-taught, GENED). The a-priori power analysis analyses given an estimated effect size of $f^2 = 0.25$ (Cohen’s $f^2$; Cohen, 1992), power $(1 – \beta) = 0.80$, $df = 2 [(R – 1)(C-1)];$ Faul, et al., 2009], and 3 cells required $n = 159$.

The second research question explored how student-level factors predicted the ego network structural characteristics (i.e., size, density, effective size, efficiency) of students across academic tracks. Table 3.6 describes the student-level factors added to the regression model. The a priori analysis for a linear regression model with fixed effects and deviation of $R^2$ from zero, called for 92 students across all tracks (given 5 predictors, Cohen’s $f^2 = 0.15$, $\alpha = 0.05$, Power = 0.80; Cohen, 1988, 1992).
Table 3.6

*Question 2 Predictor Variables*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Variable type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Dichotomous</td>
<td>Male, female</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Categorical</td>
<td>Asian, American Indian, Black, Hispanic, Multiracial, White, Other</td>
</tr>
<tr>
<td>Grade</td>
<td>Categorical</td>
<td>9th, 10th, 11th, 12th</td>
</tr>
<tr>
<td>Academic level</td>
<td>Categorical</td>
<td>SPED, Co-taught, and GENED</td>
</tr>
<tr>
<td>Crowd membership</td>
<td>Categorical</td>
<td>Popular, Jock, Brain, Normal, Tough, Outcast, None, Other/Specify</td>
</tr>
</tbody>
</table>

In the third and fourth research questions, I examined whether there were statistical
differences in ICT use (question 3) and engagement in informal and formal social activity
(question 4) across academic track. Using G*Power 3.1 (Faul, et al., 2009), the a priori analysis
for a chi-square goodness-of-fit test calls for 108 students across all academic tracks \(df = 2,\)
effect size \(w = 0.30, \alpha = 0.05, \text{Power} = 0.80; \text{Cohen, 1988, 1992}\).

For the fifth question, eight predictors [individual and institutional factors - gender,
race/ethnicity, grade, academic track, crowd membership; ego network size; and information
communication technologies (ICT) use (i.e., cellphone, texting] were examined to determine the
degree to which the combination of predictors explained the frequency of a student’s social
activity. For a regression fixed-effects model with \(R^2\) deviation from zero, G*Power 3.1 (Faul, et
al., 2009), suggested a need for 109 total participants. The a priori analysis assumed Cohen’s \(f^2 = 0.15, \alpha = 0.05, \text{Power} = 0.80\) (Cohen, 1988, 1992; Richardson, et al., 2011).

In sum, given the necessary sample size across research questions and the likely attrition
of participants during testing, I targeted a sample size of 200 participants. Further, to ensure
sufficient sample size in the smaller cells (i.e., SPED track), I had to expand oversample students
in the smaller cells and to maintain a balanced design. I decided to recruit 350 participants across
the three academic tracks (SPED, Co-taught, GENED). In total, 297 students contributed data to
the study which provided sufficient power to conduct the analyses.
Procedures

I collected data on the independent and dependent variables through student surveys of social networks, ICT use, and social activities (see Appendices D-F) administered by school staff at one time point during late fall or early spring of the 2013-2014 academic year. The data were collected in the classes listed in Table 3.3, during a specific class period mutually agreed upon by the school and the researcher.

After district and high school administrators agreed to participate, I worked with my professional contact at the school to identify classes and teachers who would administer the surveys in their classes. Once classes were identified, I provided the teachers with general instructions for delivering the surveys to students. Data from students in general education, co-taught, and special education classes were collected through paper surveys.

Survey and survey administration. One survey, the Student Survey of Social Networks, ICT Use and Social Activities, (Appendix D) and two modified versions of this survey (i.e., Modified Student Survey, Appendix E; Modified Student Survey 2, Appendix F) were developed and administered to students. The questions in Student Survey of Social Networks, ICT Use and Social Activities were informed, in part, by a previous version of this study. The classroom teacher administered the Student Survey of Social Networks, ICT Use and Social Activities (Appendix D) to students in both the GENED and co-taught tracks. The classroom teacher administered the Modified Student Survey (Appendix E) to students in the instructional classes within the SPED track. I individually administered the Modified Student Survey 2 to students in the functional classes within the SPED track. Following is a description of each survey and how and to whom surveys were administered.
**Student Survey.** The *Student Survey of Social Networks, ICT Use and Social Activities* was administered by the classroom teacher to students with and without disabilities in both the GENED and Co-taught tracks. During survey administration, each student received a survey packet with an assent letter, a cover sheet, and the Student Survey. The student survey included three sets of questions that elicited the following information: individual factors, ego network structural characteristics (through name generators, alter characteristics, name interpreter, and alter-alter questions), and social activity. I provided instruction to each classroom teacher on administering the surveys via email. The classroom teacher was instructed to pass out the surveys, read a script to the students (Appendix C), and collect the surveys when all students were finished. The teachers were also instructed on what to do in the event a student refused to participate (see Appendix C). When administering the survey, the teacher read the survey teacher script (Appendix C). Students were instructed to read the assent letter and decide whether they did or did not assent to participate in the research study. Non-assenting students were instructed to do an independent activity at the discretion of the teacher. Assenting students were instructed to write their names on the packet cover. Students were reminded their responses were confidential and that they should not share their responses with other students. The teacher introduced the survey and instructed students to complete the surveys and close their packets once they were finished. After all students completed the survey, the teachers collected the surveys, placed them back in the research packet, and delivered the packets to a marked box in the main office. The researcher collected completed surveys at the end of each day during data collection week. Surveys took students 15-20 minutes to complete.

**Modified Student survey.** Students in instructional classes within the SPED track completed, on paper, the *Modified Student Survey of Social Networks, ICT Use and Social Activities*
Activities (a modified version of the Student Survey; Appendix E). The Modified Student Survey of Social Networks, ICT Use and Social Activities differed only in the layout of the ego network questions (i.e., questions were exactly the same). In this survey, the ego network questions (i.e., name generators, alter characteristics, name interpreter, and alter-alter questions) were listed out on one page rather than placed in a table to facilitate completion (see Appendix E). This modification was implemented after I consulted with the instructional class teachers about the Student Survey of Social Networks, ICT Use and Social Activities. The teachers indicated that while their students could answer the ego network questions listed in the table in the Student Survey of Social Networks, ICT Use and Social Activities, the layout may have been confusing to the students. I recommended listing each ego network question out on each page and the teachers agreed that this was an appropriate modification.

Following the same procedures indicated in the survey administration in both the GENED and Co-taught track, the classroom teacher administered the survey to students in the instructional class. For any students who teachers designated as needing additional assistance in completing the survey, the researcher or an identified school staff member (e.g., case manager) was available to provide additional assistance. No students in the instructional level required this assistance.

Modified Student Survey 2. Students in functional classes within the SPED track completed a computer-assisted survey entitled the Modified Student Survey of Social Networks, ICT Use and Social Activities 2. Computer-assisted survey procedures for ego network data collection outlined in Gerich and Lehner’s (2006) were followed (e.g., one-to-one administration, computerized display of questions, computerized response opportunities, automatic sequential questions). The Modified Student Survey of Social Networks, ICT Use and
Social Activities 2 was an electronic, text-to-speech modified version of the survey delivered through a software program called Intellitools Classroom Suite© (Kurzweil/Intellitools, 2006; Modified Student Survey 2, Appendix F). Questions in the Modified Students Survey of Social Networks, ICT Use and Social Activities 2 were similar to questions (e.g., students freely named alters and alter-alter ties) in both the Student Survey of Social Networks, ICT Use and Social Activities and the Modified Student Survey of Social Networks, ICT Use and Social Activities, with some modifications to make responding easier (e.g., alter characteristics or name interpreter questions, providing choices rather than asking students to freely list responses).

All students placed in the functional track were surveyed at a time and place mutually agreed upon between the researcher and the student’s teacher. Although I administered the survey individually to each student, my involvement with their completion was minimal (i.e., monitored question completion, prompted student to replay the question if they did not understand).

**Confidentiality.** Once collected, I assigned each student a confidential identity code that was listed on the student survey packet. After this, the student’s cover sheet was removed from the packet and destroyed so that respondent data was only identified through the confidential identity codes.

**Analyses**

In this project, I examined (a) differences in structural ego network characteristics (i.e., network size, density, effective size, and efficiency) for students by academic track; (b) individual and institutional factors (i.e., gender, grade, ethnicity, academic track, crowd membership) that predicted structural ego network characteristics; (c) differences in ICT use (i.e., landline, cellphone, email, texting); (d) social activity (informal and formal) across
academic tracks; and (e) predictors of social activity involvement for students’ with and without disabilities.

Since structural ego network data was a primary variable of interest across research questions, I required that students provide this data for them to be included in the analyses. Questions 6-10 on the standard survey elicited ego network structural characteristic data (see Appendix D). On the modified survey (administered to students in the instructional classes within the SPED track), ego network structural characteristics were elicited from questions in Part III (pp. 4-8; see Appendix E). In the Modified Student Survey 2 (administered to students in the functional classes within the SPED track), ego network structural characteristics were elicited from questions in Part III (See Appendix F). If these questions were left blank, this student’s data was dropped from further analyses. This occurred in 5 cases.

Data management. After data were collected from students, it was hand-entered into a spreadsheet for initial screening and cleaning. Each student was assigned a confidential identity code. Student codes were listed in the first column. Subsequent columns contained information on each student’s school, academic track, and responses to survey questions. Each student-characteristic was assigned a column and individual cases associated with each characteristic were entered into the appropriate cell (i.e., row-wise). Ego network data (name generator, name interpreter, alter-attribute, and alter-alter ties) also were entered using a row-wise system where columns indicated response data and each row was a different case (Halgin & Borgatti, 2012). Using this system allowed all data, both independent and dependent variables, to be entered into one spreadsheet. Each alter was indicated by ‘A’ followed by a numeral (e.g., A1, A2 for alters 1 and 2). Alter characteristic columns were repeated for each alter. For example, alter gender for an ego who listed three alters would appear as A1gen, A2gen, and A3gen. Following alter
characteristics were columns indicating alter-alter ties. I entered alter-alter ties as indicated by Halgin and Borgatti (2012). Specifically, “variables capturing ties among alters [were] named using the following format: “<variable name> <alter number> - <alter number>” (e.g., “knows1-2” indicates that alter1 knows alter 2).

Once all data were entered into a single spreadsheet, I prepped the data using the procedures indicated by Mueller, Wellman, and Marin (1999). Transforming the data using these procedures allowed for ego network analysis and descriptive and inferential analyses. Data were first extracted into two datasets: netwise and tiewise. The netwise dataset contained all network characteristics. In this case, each network was the student respondent and the relations he/she indicated. The netwise dataset included demographic data on each student as well as data on ego network characteristics for that student and their ICT use and social activity. The tiewise dataset contained all the alter characteristics and tie characteristics with the student respondent and other alters. While each row in the netwise dataset indicated a new case or network (i.e., student), in the tiewise dataset, each row indicated the alter and tie characteristics within a specified network. Tiewise data across network alters were then aggregated to obtain a mean tie characteristic for the network. Figures 3.2 and 3.3 provide examples of both the netwise and tiewise datasets.

Figure 3.2

**Netwise Dataset**

<table>
<thead>
<tr>
<th>NETID</th>
<th>sch</th>
<th>cl</th>
<th>actr</th>
<th>gen</th>
<th>age</th>
<th>gr</th>
<th>eth</th>
<th>iep</th>
<th>pop</th>
<th>totalt</th>
<th>cell</th>
<th>email</th>
<th>text</th>
<th>house</th>
<th>hang</th>
<th>school</th>
<th>hame</th>
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<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Analytic procedures. All data were manipulated and analyzed using SPSS 21 (IBM, 2012). Both independent and dependent variables had limited missingness (<5% missingness across variables; n = 52). I performed Little’s Missing Completely at Random (MCAR) test which indicated that, indeed, the missing values were missing at random ($\chi^2 = .827$, df = 4, sig. = .935).

Research question one. Four one-way ANOVAs were used to analyze the variance in means for the four ego network characteristics (network size, density, effective size, and efficiency) by academic tracks (SPED, Co-taught, GENED). If there was a significant main effect of academic track for any of the four analyses of ego network characteristics, post-hoc pairwise comparisons were used to determine the pattern of differences between group means.

As described previously, network size was defined as the number of alters listed in the ego’s network. Density was determined by the number of ties among alters out of the total number of ties available. The density formula (Marsden, 1993) used was (i.e., $d_i = \frac{n_i(n_i - 1)}{2} a_i$). Marsden (1993) defines $n_i$ is the number of possible alter ties in a given ego’s network. Total number of ties present, $a_i$, is the sum of “dictomous indicators … which tell whether or not a relationship is present” (Marsden, 1993, p.3) among indicated alters. Effective size was
determined by total number of alters minus total number of redundant ties (i.e., alters who were
tied together without the presence of the ego). Finally, efficiency was calculated by dividing
effective size by the network size. Both effective size and efficiency are measures of brokering
or bridging social capital where the ego receives novel information from unconnected alters and
can utilize that information to their own benefit. If an ego has two separate sets of alters who are
not tied to each other, an efficient way information or resources can be exchanged between these
groups is through the ego. For instance, an ego who passes information about an upcoming
concert being performed by one set of alters to another set of alters, the ego improves his/her
position with both sets of alters (one group receives more audience members at their concert; the
other set of alters learns about a concert).

**Research question two.** For research Question Two, I was interested in individual and
institutional factors (i.e., gender, age, grade, race/ethnicity, academic track, and crowd
membership) that predicted student network (a) size, (b) density, (c) effective size, and (d)
efficiency. For this, I conducted four separate regression models with fixed effects (deviation
from $R^2$) and six predictors. I entered data using forward selection regression modeling to
iteratively add predictors into the model to determine if each predictor was correlated with the
dependent variable and whether the addition of subsequent predictors explained significant
additional levels of variability in the model (Cohen’s $f^2 = 0.15$, $a = 0.05$, $P=0.80$). Non-significant
variables were excluded from the model (Pedhazur, 1997).

**Research questions three and four.** For Research Questions 3 and 4, I conducted chi-
square tests to determine if there were significant differences between students in the three
academic tracks in (a) use of ICT (landline, cellphone, email, texting) and (b) participation in
informal (hang out with friends at home/friend’s house) and formal social activity (hang out with
friends school-sponsored activities/events). A chi-square test was appropriate for these tests because the dependent variable was dichotomous (i.e., yes/no used ICT mode or engaged in informal/formal social activity).

**Research question five.** For Research Question 5, I used one regression fixed-effects models ($R^2$ deviation from zero) to assess whether individual and institutional factors (gender, grade, race/ethnicity, academic track, and crowd membership), ego network size, or information communication technology use (i.e., cellphone, texting) predicted the variability in frequency of (a) informal social activity (hang out with friends at home or at a friend’s house) and (b) formal social activity (hang out with friends at school-sponsored activities/events). I again entered data using forward selection to systematically add predictors into the model and test whether their addition explained a significant amount of variability to the model. In doing so, SPSS iteratively adds each variable only when they add significant improvement to model fit. Because the analyses in Research Question 3 indicated that, overall, students did not use landline phone or email to communicate with friends, these forms of ICT were not included in the model.

In addition, because previous analyses suggested that ego network characteristics differed between academic tracks and may impact activity independent of other individual characteristics, I chose to follow-up with a regression fixed-effects models ($R^2$ deviation from zero) to assess whether ego network structural characteristics only (without student-level factors or ICT use) significantly predicted the frequency of participation in informal and formal social activities.

In summary, data on individual and institutional factors, ego network characteristics, ICT use, and participation in formal and informal social activities for 297 students across three academic tracks (SPED, Co-taught, and GENED) in two high schools was collected. Students completed survey questions about their demographic characteristics, crowd membership, and
ICT use (i.e., individual factors); ego network structural characteristics; and informal and formal social activity. Students in the general education and co-taught tracks and students in the instructional level special education track completed paper surveys. Students in the functional level special education classes completed a computerized survey. The Research Questions examined (a) differences in ego network structural characteristics by academic tracks; (b) individual and institutional factors (i.e., gender, grade, ethnicity, academic track, crowd membership) that predicted ego network structural characteristics; differences in (c) ICT use and (d) engagement in informal and formal social activities by academic track; and (e) whether individual and institutional factors, network size, and ICT use predicted frequency of engagement in informal and formal social activity. In the next chapter, I discuss the results of the analyses.
Chapter 4

Results

This chapter presents results of analyses of the data collected to address the five Research Questions. To address the first research question, the variability of the means of ego network structural characteristics of adolescents with and without disabilities across academic tracks (i.e., general education, co-taught, special education) were examined. To address the second research question, the association between individual and institutional factors and ego network structural characteristics were explored. Next, differences in information technology (ICT) usage and participation in informal and formal social activity for adolescents with and without disabilities by academic track were tested. To address the fifth research question, individual and institutional factors, the structural characteristics of ego networks, and information communication technology (ICT) usage were regressed on informal and formal social activity to determine if these significantly predicted outcomes. Finally, ego networks structural alone were regressed on both informal and formal social activity to determine if these predictors were significant.

Research Question 1 - Differences in Egocentric Network Structural Characteristics based on Academic Track

Student responses were coded and analyzed to examine ego network size, density, effective size and efficiency and differences based on academic track (i.e., institutionally designated support need and inclusiveness). As described previously, effective size is the size of the network, reduced by any redundant ties within the network (e.g., Alter 2 and Alter 3 are connected despite the ego). This metric tells us how much impact an ego is having on the network (Hanneman & Riddle, 2009). Efficiency represents the proportion of an ego’s ties that are not redundant. This metric tells us how much the ego is getting out of the ties that it does
have (Hanneman & Riddle). Effective size and efficiency can provide information on the amount of bridging an ego provides to the alters in their networks.

Table 4.1 provides means and standard deviations for the four structural characteristics overall and broken down by academic track. The mean number of alters listed for all students was 4.00 ($SD = 1.34$). Overall, students in general education and co-taught academic tracks indicated higher structural characteristics than students in the SPED track. Students in the special education track tended to reported smaller network sizes, less dense networks (i.e., less connected networks), smaller effective size (i.e., more redundancy in their networks), and less efficient networks. Less differentiation was found between the co-taught and GENED groups.

Table 4.1

<table>
<thead>
<tr>
<th>Characteristics by academic track</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of alters (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPED</td>
<td>4.00</td>
<td>1.34</td>
</tr>
<tr>
<td>Co-taught</td>
<td>2.22</td>
<td>1.51</td>
</tr>
<tr>
<td>GENED</td>
<td>4.30</td>
<td>1.00</td>
</tr>
<tr>
<td>Density (N)</td>
<td>0.42</td>
<td>0.37</td>
</tr>
<tr>
<td>SPED</td>
<td>0.27</td>
<td>0.39</td>
</tr>
<tr>
<td>Co-taught</td>
<td>0.46</td>
<td>0.39</td>
</tr>
<tr>
<td>GENED</td>
<td>0.427</td>
<td>0.34</td>
</tr>
<tr>
<td>Effective size (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPED</td>
<td>3.58</td>
<td>1.34</td>
</tr>
<tr>
<td>Co-taught</td>
<td>1.96</td>
<td>1.47</td>
</tr>
<tr>
<td>GENED</td>
<td>3.79</td>
<td>1.13</td>
</tr>
<tr>
<td>Efficiency (N)</td>
<td>3.86</td>
<td>1.12</td>
</tr>
<tr>
<td>SPED</td>
<td>0.87</td>
<td>0.18</td>
</tr>
<tr>
<td>Co-taught</td>
<td>0.77</td>
<td>0.34</td>
</tr>
<tr>
<td>GENED</td>
<td>0.88</td>
<td>0.13</td>
</tr>
</tbody>
</table>

To determine if the descriptive findings presented in Table 4.1 represented significant differences across academic tracks, I conducted four ANOVAs across academic tracks, one for each of the four structural characteristics. Results suggested that there were significant overall differences at the $p < 0.01$ level for each of the four structural characteristics, indicating a main effect of academic track (see Table 4.2). To decompose the differences related to academic track,
post-hoc Tukey’s Honestly Significant Difference tests were run to test whether the means of each group were significantly different from each other at the $p > 0.01$ level. Results indicated that the means of ego network structural characteristics of students in the special education academic track were significantly different than students in both the co-taught or general education tracks for each of the four ego network characteristic analyses, but that the co-taught and general education tracks did not differ from each other. Post-hoc analysis indicated a medium effect size with sufficient power to detect the effect ($1 - \beta = 0.98, df_i = 2 \ df_f = 295$; Cohen, 1988).

Table 4.2

<table>
<thead>
<tr>
<th>Analysis of Variance of Ego Network Structural Characteristics by Academic Track</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>145.194</td>
<td>2</td>
<td>72.60</td>
<td>54.76</td>
<td>0.001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>389.80</td>
<td>294</td>
<td>1.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>535.00</td>
<td>296</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch</td>
<td>1.19</td>
<td>2</td>
<td>0.60</td>
<td>4.41</td>
<td>0.01</td>
</tr>
<tr>
<td>Density</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>0.46</td>
<td>2</td>
<td>0.23</td>
<td>7.19</td>
<td>0.001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>39.67</td>
<td>294</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40.86</td>
<td>296</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch</td>
<td>2/105.40</td>
<td></td>
<td>3.85</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>121.25</td>
<td>2</td>
<td>60.62</td>
<td>29.61</td>
<td>0.001</td>
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<tr>
<td>Within Groups</td>
<td>9.48</td>
<td>294</td>
<td>0.03</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>9.94</td>
<td>296</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch</td>
<td>2/101.43</td>
<td></td>
<td>29.61</td>
<td>0.001</td>
<td></td>
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<tr>
<td>Effective size</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>528.42</td>
<td>296</td>
<td>1.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>407.17</td>
<td>294</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2/93.28</td>
<td></td>
<td>93.28</td>
<td>0.11</td>
<td></td>
</tr>
</tbody>
</table>

*All analyses are significant at the $p < 0.01$ level.

**Research Question 2 - Student Characteristics and Ego Network Characteristics**

In research question two, I examined the extent to which four individual factors (i.e., gender, grade, ethnicity, crowd membership) and one institutional factor (i.e., academic track –
special education, co-taught, general education) predicted each of the four ego network structural characteristics. Student gender, grade, ethnicity, crowd membership, and academic track were entered into four separate regression models for each structural characteristic. Table 4.3 shows the significant predictors for each model, and the specific findings are described in greater detail in the following sections. A post-hoc analysis indicated sufficient power [Power (1-\(\beta\) = 0.999), \(df\) = 10] to detect a medium effect (\(f^2 = 0.15\)) for each model (Cohen, 1988).

Table 4.3

Model: Student-level Factors on Ego Network Structural Characteristics

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>(\beta)</th>
<th>(R^2)</th>
<th>(\Delta R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Network size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.27</td>
<td>0.07</td>
<td></td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>SPED*</td>
<td>-1.72</td>
<td>0.21</td>
<td>-0.44</td>
<td>0.29</td>
<td>0.02</td>
</tr>
<tr>
<td>9(^{th}) grade*</td>
<td>0.37</td>
<td>0.14</td>
<td>0.14</td>
<td>0.29</td>
<td>0.01</td>
</tr>
<tr>
<td>12(^{th}) grade**</td>
<td>0.45</td>
<td>0.20</td>
<td>0.15</td>
<td>0.29</td>
<td>0.01</td>
</tr>
<tr>
<td>Asian**</td>
<td>-0.68</td>
<td>-0.34</td>
<td>-0.10</td>
<td>0.30</td>
<td>0.01</td>
</tr>
<tr>
<td>2. Density</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.35</td>
<td>0.31</td>
<td></td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>9(^{th}) grade*</td>
<td>0.24</td>
<td>0.04</td>
<td>0.19</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>3. Effective size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.83</td>
<td>0.07</td>
<td></td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>SPED*</td>
<td>-1.71</td>
<td>0.22</td>
<td>-0.44</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>10(^{th}) grade**</td>
<td>-0.53</td>
<td>0.26</td>
<td>-0.11</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>4. Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.88</td>
<td>0.01</td>
<td></td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>SPED*</td>
<td>-0.12</td>
<td>0.03</td>
<td>-0.22</td>
<td>0.23</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Note: All predictors in the model were significant at the \(p < 0.001^*\) or \(p < 0.01^{**}\). Post-hoc analysis indicated effect size \(f^2 = 0.15\), Power (1-\(\beta\) = 0.999), \(df = 10\).

Network size. The first model examined the association between individual and institutional factors and network size. Forward selection was used to enter predictors in the model, which uses an iterative process of adding predictors only when they add significant improvement to model fit. Gender (male/female), grade (9\(^{th}\), 10\(^{th}\), 11\(^{th}\), 12\(^{th}\)), race/ethnicity (Asian, American Indian, Black, Hispanic, White, Multiracial), academic track (GENED, co-taught, SPED), and Crowd Membership (popular, jock, brain, normal, tough, outcast, none, brain/normal, jock/normal) were entered as dummy coded variables in the model. Because of cell
size, American Indian was collapsed with the Asian category to create an “Other” category because the model could not fit it in a correlation matrix. Using forward selection, special education, 9th grade, 12th grade, and Other race/ethnicity were kept in the model as significant predictors. Specifically, being in the special education track was a strong predictor of network size, with students in this track having approximately 25% fewer network members (i.e., decreased by 0.44). Being in 9th grade was associated with a slight increase (0.14) in the number of network members as was being in grade 12 (0.15 increase). Finally, being identified as in the Other racial/ethnic category was associated with 0.10 fewer network members. The model had good fit with approximately 30% of the variance in network size explained by the predictors.

**Density.** A model to determine the individual and institutional factors that were significantly associated with ego network density was run. As before, predictors were entered through forward selection to iteratively determine which predictors added significantly to model fit. Only being in 9th grade was significantly associated with network density. Specifically, being in 9th grade improved network density by 0.19. While 9th grade was significantly associated with network density, the model only explained about 3% of the variance in network density ($R^2 = 0.03$).

**Effective size.** The next model examined the relationship between individual and institutional factors and ego network effective size. Effective size is a measure of the non-redundant ties within a network and serves as an indicator of an ego’s bridging capabilities (i.e., providing a potential bridge for transfer of important information across a network). Using forward selection, the strongest predictor was placement in the special education track, which predicted a 0.44 smaller effective size ($p < 0.001$) than if the student was in the co-taught or general education tracks. Being in 10th grade was associated with an additional 0.11 smaller
effective size ($p < 0.01$). Being a member of the special education track predicted 23% of the variance in effective size ($R^2 = 0.23$) and being in the 10th grade explained an additional 2% ($R^2 = 0.02$) of the variance in effective size.

**Efficiency.** The final model examined the association between individual and institutional factors and network efficiency by adding each student-level factor iteratively into the model. Special education placement was the only significant predictor left in the model. While this variable only explained 5% of the variance in efficiency ($R^2 = 0.05$), being a member of the special education track decreased the individual’s network efficiency by 22% ($p < 0.001$),

**Research Questions 3 and 4 – ICT Use and Social Activity by Academic Track**

Research Question 3 addressed differences in information communication technology use by academic tracks. Research Question 4 addressed differences in engagement in informal and formal social activity by academic track. Given the similarities in the analyses, the findings are presented together in the following sections.

Descriptive statistics for all students across ICT use and social activity are displayed in Table 4.4. Table 4.5 breaks down these findings based on academic track. As shown in Table 4.4 few students use a landline (27%) or email (24%) to communicate with their friends. Instead, a majority of students use a cellphone to call (81%) and text (87%) their friends. Most students also indicated that they hang out with their friends at home or at a friend’s house (88%) and at school (75%). The descriptive statistics provided in Table 4.5, however, suggest there may be differences based on academic track with students with disabilities who have more intensive support needs indicating using a cellphone or texting to communicate with friends less frequently.
Differences in ICT use by academic track. Specific to information communication technology use, when analyzed by academic track, there is a significant association between academic track and whether or not a student calls their friends by cellphone ($X^2 = 127.55, p = 0.00, df=2$). Despite some students in the SPED track, in both the instructional and functional classes, indicated calling friends on a cellphone (16) and texting friends (18), students in the special education academic track (i.e., instructional or functional) are significantly less likely to contact their friends by cellphone than those in the co-taught or general education tracks. In fact,
several respondents in the special education academic track indicated or wrote that they did not own a cellphone when completing the surveys. Similar findings were present for texting ($\chi^2 = 155.83$, $df = 2$, $p < 0.001$). Students in inclusive placements (co-taught and general education) did not, however, show significant differences from each other.

**Differences in social activity by academic track.** Social activity represents only one key element of social outcomes that is enhanced by social capital, particularly for adolescents as they spend a majority of their time engaging in social activities with peers. Therefore, measuring formal and informal social activities provides insight into the impact access to social capital had for participating adolescents.

In terms of social activities, there was a significant association between a respondent’s academic track and whether or not they hung out with friends at home or at a friend’s house, and if they hung out with friends at school ($\chi^2 = 18.29$, $df = 4$, $p < 0.001$). Specifically, students in the special education track reported hanging out with their friends at home/at a friend’s house or at school-sponsored events less frequently than students in general education or co-taught tracks, although hanging out at school with friends was reported much higher. There were no significant differences in informal or formal social activity between students in co-taught and general education tracks. Additionally, students in the special education track were less likely to hang out with their friends at school ($\chi^2 = 148.14$, $df = 2$, $p < 0.001$).

**Research Question 5 – Significant Predictors of Informal and Formal Social Activity**

In research question five, I ran two regression fixed effects models to examine the degree to which individual and institutional factors, network characteristics, and information communication technology use predicted the frequency with which students engage in formal and informal social activity. Individual and institutional factors included gender, grade,
race/ethnicity, academic track, and crowd membership. Network characteristics included network size, density, effective size, and efficiency. Information communication technology included using a cellphone to communicate with friends (yes/no) and texting to communicate with friends (yes/no). Email and landline use were not included in the model because large numbers of students across academic tracks indicated they did not use these types of ICT. Each categorical predictor (student-level factors, ICT use) was assigned a dummy code with 1 indicating the student had the condition and zero indicating the student did not. Predictors were entered into the model through forward selection. Table 4.6 provides the results for the two models. A post-hoc analysis indicated sufficient power [Power (1-\( \beta \) = 0.999), \( df = 10 \)] to detect a medium effect (\( f^2 = 0.15 \)) for each model (Cohen, 1988).

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>( \beta )</th>
<th>( R^2 )</th>
<th>( \Delta R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How frequently student hangs out with friends at home or at a friend’s house*</td>
<td>Constant</td>
<td>1.49</td>
<td>0.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cellphone**</td>
<td>1.48</td>
<td>0.34</td>
<td>0.25</td>
<td>0.46</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Ninth grade**</td>
<td>-1.17</td>
<td>0.30</td>
<td>-0.25</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>White***</td>
<td>0.74</td>
<td>0.30</td>
<td>0.16</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>2. How frequently student hangs out with friends at school-sponsored activities/events*</td>
<td>Constant</td>
<td>3.52</td>
<td>0.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female***</td>
<td>-1.10</td>
<td>0.55</td>
<td>-0.12</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>3. How frequently student hangs out with friends at home or at a friend’s house (ego characteristics only)</td>
<td>Constant</td>
<td>0.98</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Density</td>
<td>0.93</td>
<td>0.47</td>
<td>-0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Efficiency</td>
<td>2.02</td>
<td>1.05</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How frequently student hangs out with friends at school-sponsored activities/events</td>
<td>Constant</td>
<td>1.07</td>
<td>1.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network size</td>
<td>0.70</td>
<td>0.26</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Included predictors are significant at the * * * \( p < 0.001 \) level or *** \( p < 0.05 \) level. Post-hoc analysis indicated effect size \( f^2 = 0.15 \), Power (1-\( \beta \) = 0.999), \( df = 10 \).
Models one and two used student-level factors, network size, and ICT use (cellphone and texting) as predictors. Models three and four included only ego network structural characteristics (network size, density, effective size, efficiency) in the model.

**Informal social activity.** Model one (see Table 4.6) indicated that cellphone use, being in ninth grade, and being White had a significant relationship with informal social activity frequency. Specifically, using a cellphone to communicate with friends was associated with hanging out with friends at home or at a friend’s house 0.25 more times per week. Being White was associated with an increase of 0.16 times per week. However, being in ninth grade was associated with hanging out with friends at home or at a friend’s house 0.25 fewer times per week. Using a cellphone had the largest predictive value as it explained 46% of the model. Other student-level factors, particularly academic track, and network characteristics were excluded from the model as they were not significant.

**Formal social activity.** When examining predictors of formal social activities at school-sponsored events, this model (see Model 2; Table 4.6) had a much poorer fit (R = 0.01) with only one predictor, female, staying in the model. Specifically, being female was associated with 0.12 fewer times per week hanging out with friends at school-sponsored activities/events. While this model has a strong effect size and power, being female explained so little of the variance which may indicate other factors, not measured, influence this outcome.

**Ego network characteristics and social activity.** Given that the results of previous analyses suggesting that the strength and utilization of an individual’s ego network can influence one’s activity level, two additional models were run with informal and formal social activity as dependent variables and structural network characteristics only as the predictor. This was performed because in Research Question 1, structural characteristics significantly differed across academic tracks and it was important to explore if focusing on ego network structural characteristics would produce a better model fit when predicting formal and informal social
activities. The model for informal social activity (Model 3, Table 4.7), showed a significant effect of network density and efficiency. Specifically, an increase in network density, where redundant ties are included, was associated with a 0.10 times per week decrease in hanging out with friends at home or at a friend’s house. An increase in efficiency, where information flows efficiently through the network, was associated with a 0.16 increase in times per week hanging out with friends. The model for formal social activities also showed significant results (see Model 4, Table 4.6). Specifically, network size was associated with a 0.20 increase in times per week a student hangs out with friends at school.

**Conclusion**

To address the five research questions presented at the end of Chapter 2, first an examination of the differences in ego network structural characteristics by academic track. The ANOVA of ego network characteristics by academic track revealed that students in the special education track had smaller, less dense, more redundant networks resulting in these networks being less efficient for the ego. Then, individual and institutional factors having a significant association with each ego network characteristic were explored. This analysis revealed that being in the special education track, 9th grade, 10th grade, and being in the Other racial/ethnic group significantly impacted network size. A person’s network density was positively impacted by being in 9th grade but effective size (i.e., network redundancy) was negatively associated with being in the special education track and also in 10th grade. Building on these findings, differences in ICT use and formal and informal social activity by academic track were analyzed. Students in the special education track communicated with their friends through cellphone use or texting and hung out with their friends at home or a friend’s house and at school significantly less than students in general education and co-taught classes. Finally, the degree to which student level-
factors, ego network characteristics, and ICT use (cellphone and texting only) predicted informal and formal social activity was explored. Using a cellphone to communicate with friends and being White had positive associations while being in 9th grade had a negative association with informal social activity. Being female was negatively associated with the frequency of formal social activity. When only examining ego network characteristics, and their associations with formal and informal social activities, network density and efficiency were positively associated with frequency of informal social activities. Network size was positively associated with frequency of formal social activities. These results indicate that adolescents with and without disabilities across academic tracks, namely across inclusive (general education and co-taught) and segregated (special education) tracks, experience ego networks, ICT use, and social activity differently with those in segregated tracks. Those in segregated track experience significantly worse outcomes with regard to ego network characteristics, and participation in formal and informal social activities. Chapter 5 provides a context for the results and explores implications for research and practice.
Chapter 5

Discussion

A social capital model was developed and tested to describe how individual characteristics (i.e., gender, race/ethnicity, grade, crowd membership, and information communication technology use - ICT) and institutional policies (i.e., school-based academic tracking policies) impact the formation of social capital through social networks. The data revealed significant differences in ego network structural characteristics for adolescents with and without disabilities across academic tracks. Across all analyses, students in inclusive placements had more positive social network outcomes and greater participation in formal and informal social activities than students in segregated placements. Additionally, individual factors (e.g., academic track, grade) predicted ego network structural characteristics.

In the following sections, the implications of these findings for future research and practice are described. The implications are organized around key findings related to: the impact of social capital; assessing ego networks; academic tracking and opportunities for social activities; and access to technology. While this research is preliminary, it provides important information on the structural characteristics of networks, the support those networks provide to adolescents with disabilities, and how school policies can impact opportunities to build networks.

Impact of Social Capital

Examining access to and utilization of social capital by adolescents is essential. It also is important to explore factors such as disability status or academic track that influence access and utilization of social capital by adolescents. If it is understood and leveraged, social capital, the social connection and the information and support, which is exchanged between people through participation in social activities, can lead to improvements across different life domains. In this
study, students in the segregated special education track did (a) identify friends, (b) report connections among friends, (c) use technology to communicate with friends, and (d) participate in social activities. However, there were significant disparities when comparing these students to their age peers with and without disabilities in inclusive settings. This is congruent with research using whole network analysis (Farmer et al., 1998, 2011). However, the present analyses extend these findings by using ego network analysis which does not limit the analysis to bounded classroom environments. In doing so, the data reveal that even when opening network analyses to a broader array of alters where students have a chance to identify network members within and outside of their classrooms, students in segregated settings also have more restricted networks. This highlights that within and across environments, segregation limits the social capital available to adolescents with disabilities with more intensive support needs. It is likely that this phenomenon is the result of many factors interacting in complex ways. Further research is needed to explore the mechanisms for this effect (e.g., limited opportunities to model social skills used by age peers; biased opinions of other students and teachers based on the devalued, segregated status; and/or a lack of social relationships; [Finley, 1984; Harris, 2011; ; Rosenbaum et al., 1976]).

**Bonding vs. Brokering Social Capital.** In Chapter 2, social capital was defined as the resources obtained and exchanged through the social connections one has with others. In making and sustaining social connections, the individual recognizes that each relationship provides a benefit (e.g., emotional, occupational) either immediately or in the future. Because of this benefit, individuals invest and engage in social connections and social relationships so they can obtain support (i.e., bonding social capital) or better their own condition (i.e., brokering social
capital). Research has indicated that both bonding and brokering social capital are important and provide tangible benefits to the individual.

Although both bonding and brokering social capital were measured in this study, there were differences in the degree to which students were accessing these different forms of capital across academic tracks. For instance, students in more inclusive settings (i.e., GENED and Co-taught tracks) indicated highly dense networks, an indicator of bonding social capital where highly connected alters provide the ego with more support (Marsden, 2002; Putnam, 2000). These students were also more likely to engage in informal social activities (i.e., hang out with friends at home or at a friend’s house). This may reflect the bonding phenomena of highly connected networks where the support that connected alters provide can influence individual behavior (Marsden; Putnam), suggesting that students in inclusive settings have greater opportunities for building bonding social capital. This interpretation is congruent with other research using whole network analysis where students with less intensive support needs (i.e., students who were more likely to be in inclusive settings) were found to be members of large networks with many students reporting that they knew each other (Farmer et al., 2011; Pearl et al., 1998).

In contrast, students in the special education track experienced less dense networks, suggesting that their ability to benefit from the bonding phenomena was lower. This may be due to their limited exposure to a large number of peers, which can occur for students in segregated academic tracks (Byrne, 1988). However the degree to which students in more inclusive settings were actually benefitting from high-density social networks needs to be examined in future research. For example, it is possible that having a larger and more dense network is not always necessary to build strong relationships and to build other forms of social capital (i.e., brokering
social capital). However, the current finding that students in more inclusive environments experienced more dense networks and reported greater levels of participation in social activities suggests that segregation may exert an influence on network characteristics and outcomes. The reasons for these differences and their relationship to the network quality experienced by students in different academic tracks is not clear. Further research should examine not just the size and density of networks, but also (a) the degree to which students are able to use dense networks to build bonding social capital, (b) the quality of networks, and (c) the individual and institutional factors that impact the size and density of networks. Future questions also should examine if there are differences in the quality of networks for students in segregated environments, and the degree to which these factors influence participation in social activities and the development of bonding social capital.

Bonding social capital, however, does not always benefit the individual. In fact, Burt (1984) and others (Carrasco et al., 2006; Marsden, 2002) suggest that highly dense networks (i.e., highly connected) may (a) prevent opportunities for individuals to access novel information or (b) cause individuals to experience highly monitored behavior that prevents the ego from seizing new opportunities. In this view, holes in one’s network, where the individual alone connects networks (see Figure 2.3 for visualization), provide the individual with opportunities to obtain and exchange novel information between networks (e.g., brokering social capital). As discussed in Chapter 2, holes in the network can be measured through effective size (i.e., the network size with redundant ties removed) and efficiency (i.e., the length of path information needs to travel from one location in the network to another). In this instance, the individual has power to transfer information to and from each network (i.e., brokering between networks). Given this, students with less dense networks, such as students in the SPED track, could
potentially benefit more from brokering social capital (i.e., higher effective size and efficiency measures), however, future research is needed to examine this possibility. In the present study, while students in the SPED track had significantly less dense networks (indicating low bonding capital) their experience with brokering social capital was less clear, as indicated by significant differences in effective size but not in efficiency. This suggests that there may be opportunities for students in segregated settings to broker across segregated and inclusive settings. Although this study was not designed to measure if this occurred, the data on participation in formal and informal social activities did not suggest that the lack of differences in brokering capital led to more opportunities for social activities. It is possible that students in the SPED track need support to understand the opportunities available for brokering. Further, the lack of differences may also mean that students in inclusive environments could also use support in this area. It may be, in fact, that adolescents generally are more focused on the size of their network and not necessarily the opportunities for brokering across social settings and activities.

If having less dense networks can provide adolescents with freedom to behave and act on information and activities in one’s own way, as some researchers argue (i.e., brokerage social capital; Burt, 1984; 1992), fostering brokering social capital may be important for all students to enable them to build relationships across social groups. Further research is needed on this dynamic and the degree to which it is influenced by student factors, such as choice (e.g., students having opportunities to self-select peers and social connections/activities) vs. external attitudes and policies (e.g., schools making decisions regarding access to inclusive environments based on perceptions of disability).
Assessing Ego Networks

To understand how social capital interacts with individual and institutional factors to impact valued life outcomes, such as participation in social activities with peers, having valid and reliable means of assessing social networks is critical. Whole network analysis has been utilized to examine the dynamics of relational ties among school-age adolescents within a designated environment (Berger & Rodkin, 2012; Farmer et al., 2011; Logis et al., 2013). Yet, this methodology can limit the empowerment of adolescents as it does not recognize that adolescents experience many different types of environments, and can determine for themselves where and with whom they connect, why those relationships occur, and how they use those relationships to their advantage. Consequently, ego network analysis, where network boundaries are not predetermined by researchers, needs to be further explored as predetermined network boundaries may or may not be an accurate representation of the individual’s perceived network, particularly for adolescents. Data from the present study revealed that adolescents with and without disabilities could meaningfully participate in assessments of their unbounded social networks. While adolescents spend a significant amount of their day at school, the schools should not be considered a community alone. Schools are communities within neighborhoods, within towns, within counties, and within states. They are subject to the pushes and pulls of their communities. Programming, interventions, and analyses that recognize those interactions have the potential to provide broader information about access to social capital.

Understanding access to social capital through ego network analysis is critical as previous research has suggested that ego network characteristics, over and above individual characteristics, may provide the individual with the knowledge, information, and social connections from which to draw on and engage with age peers (Schaefer et al., 2011). While
some students are skilled at understanding and utilizing their networks, other students may need institutional supports that assist with network formation and value different types of social connections. Schools, through policies and practices, can create supports for individuals to engage in cultural norms, manage expectations for appropriate behavior, and facilitate opportunities for social interaction. The power of the teacher and the school in setting norms and reinforcing acceptable behaviors has long been established (Farmer, Lines, & Hamm, 2011). Thus, schools can provide students with access to inclusive opportunities that put the power of social connection in the hands of students (Almqvist & Granlund, 2005). Further research is needed to identify school-based interventions that teach students to map out their connections with various groups and use those maps to identify opportunities for (a) gaining social support, (b) obtaining new information, (c) participating in social activities, and (d) developing other life domains such as employment, independence, leisure, self-advocacy, and living arrangements. If, as argued in the supports model (Schalock et al., 2010), the reference environment for all activities is the community, then this must be reinforced in the general education classroom and in social activities engaged in by age peers (King et al., 2003). If students are provided with a visualization of the link between their networks and how those networks can be used to broker new opportunities and power, it may be a way to help students with and without disabilities become more empowered and self-determined.

Ego network analysis and students with intensive support needs. Students with more intensive support needs are rarely included in social network analysis (Farmer et al., 1999; Farmer et al., 2009; Farmer et al., 2011). This can occur because of the perceived or actual inaccessibility of the measurement tools and assumptions about a lack of relevance of social networks for this population. And, in cases where researchers have examined the social
networks of students with more intensive support needs (Chamberlain et al., 2007; Garrison-Harrell et al., 1997; Haring & Breen, 1992), only a few researchers have used systematic methodologies for involving these students (Fisher et al., 2013; Lippold & Burns, 2009; Locke et al., 2010; van Asselt-Goverts et al., 2013). In fact, membership in a social network is often determined by other students without the input of the target student with a disability (Garrison-Harrel et al., 1997) and/or by ratings from teachers or researchers (Kennedy & Itkonen, 1994; Raghavendra et al., 2012). Technological advances, however, provide many opportunities for students with more intensive support needs to communicate information on their ego networks and social behavior. As evidenced by the students in this study who were in the functional class within the SPED track, self-directed computer-assisted survey administration was used to gather responses from students with intensive support needs. Further research is needed to continue to test and refine technological supports to enable the participation of students with intensive support needs in ego network analyses as well as comparative work to examine the congruence between student self-report and reports from others such as teachers. Overall, given that social network membership is related to prosocial behavior (Farmer et al., 2011) and that schools must be concerned about the social condition of all students, it is important for researchers to develop and refine ways to include all students in social network analyses.

**Academic Tracking and its Impact on Social Capital**

Schools have developed ways to differentiate curriculum to address varying student needs (Gamoran & Page, 1992; Oakes, 1985). In the United States, one common approach has been to link differentiated curriculum with different classroom placements, grouping high school students in academic tracks in different classrooms to reduce group member differences (Ross & Harrison, 2006; Slavin, 1990; Wouters et al., 2012). Tracking, however, has been shown to limit
outcomes by reducing access to a rigorous academic curriculum for students in “lower” tracks and to promote negative student self-concepts and teacher perceptions of students in “lower” tracks (Byrne, 1988; Trautwein et al., 2006; Wouters et al., 2012). Placement in academic tracks, however, is not simply based on varying student needs. Placement in different tracks is influenced by external factors, including stereotypes based on student characteristics (Kelly, 2004; Page, 1991). In the disability field, these stereotypes have been particularly pervasive (Child & Nind, 2012). However, the impact of academic tracking on the academic and social experiences of adolescents, adolescents’ ego networks, and students’ engagement in formal and informal social activities have not been fully explored, particularly for adolescents with disabilities.

The findings from the present student suggest that ego network characteristics and access to social activities through ego networks differ as a function of membership in an academic track. Students in segregated settings (SPED) derived significantly less benefit from ego networks than students in inclusive settings (i.e., co-taught and general education). This suggests a significant impact of access to inclusive classrooms and curriculum on students’ ego networks. These findings are congruent with previous research suggesting that students with greater support needs have fewer interactions with friends (Cadwallader & Wagner, 2003), experience smaller social networks, and have lower levels of peer support than their age peers without disabilities (e.g., Farmer, et al., 2011; Kef & Dekovic, 2004; Raghavendra et al., 2012). However contrary to previous research, these findings were directly related to placement in an academic track and not just a function of disability label. Students with disabilities in general education classrooms (5% of whom had IEPs) and co-taught classrooms (30% of whom had IEPs) did not report significant differences in their in informal and formal social activities.
As reported earlier, students in the SPED track had a variety of disabilities including learning disabilities, behavior disorders, other health impaired, autism, and intellectual disability. Anecdotally, the contact teachers at each school indicated that many students with the same disability label in the instructional level class of the special education track had similar support needs to some students in the co-taught track. This emphasizes that teacher perceptions and parent advocacy impacted placement, and highlights the role of these external factors on academic track placement. Further research is needed on the impact of external factors on placement. As this was not directly tested in this study, alternative explanations could be posed (Siperstein, Parker, Norins-Bardon, & Widaman, 2007).

The results also suggest that students in the special education track may not be receiving the appropriate social supports to participate in formal and informal social activities. As suggested by previous research and confirmed in this study, students in segregated academic tracks participated less frequently in formal and informal social activities with peers (Rosenbaum et al., 1980; Schaeffer et al., 2011). Further research is needed on the specific mechanisms that contribute to these findings. Schools, for example, often report that they do not have funding to provide supports during extra-curricular activities and this may be an influencing factor. However, the lack of opportunities for interaction in inclusive classrooms also may impact access to bonding social capital. This phenomena could impact the receptiveness of age peers to students with significant support needs in informal social activities or extracurricular activities, creating barriers to participation and engagement. Further, attitudinal barriers of staff may play a role as the literature has reported that students with disabilities do not expect to participate at the same rate as students without disabilities due to staffing expectations (Glideman & Roth, 1980).
It may also be that the experience of students with disabilities outside of school are equally segregating and influence the relationships and interactions they have with students in other academic tracks. This highlights the importance of future research assessing the broader ecological contexts within which adolescents function. For instance, when students were asked to report how they knew each identified friend (e.g., classmate, neighbor), they were not prompted to first consider a specific context (e.g., school, work, neighborhood) and then report on network members. As a result, each student’s ability to recall the complete network information may have been limited (Kogovsek & Ferligoj, 2005). Given that academic tracking increases the salience of differences among students (Byrne, 1988), it is likely that placement in segregated settings magnifies differences, and in turn, restricts opportunities for adolescents with disabilities to increase the size of their networks. Further research is needed to clarify whether the limited ego network structural characteristics are consistent across diverse environments for adolescents with disabilities.

Further research is needed to examine differences in schools that do not use academic tracking and more strongly emphasize inclusion and access to the general education curriculum for all students. Advanced statistical methodologies such as propensity score matching (e.g., Martorell, 2005) and regression discontinuity designs (e.g., Dynarski, 2003; Flores, 2010) can be used to match students with similar support needs and examine factors that might mediate differences in social experiences and networks. In using these methodologies, researchers can examine conditions among individuals within large-scale datasets (e.g., National Longitudinal Transition Study-2, NLTS-2) or between datasets (e.g., between the NLTS-2 and the Educational Longitudinal Study of 2002 or the High School Longitudinal Study, 2009). Such analyses provide an opportunity to examine nationally representative data to understand the differences
experienced by students with and without disabilities, particularly for those with more significant support needs for whom sampling is much more difficult due to the low incidence of these disabilities. Conducting this type of research is also important because these datasets track long-term outcomes and could allow for an examination of the relationship between network conditions and employment, citizenship, housing, and community participation (Schalock et al., 2009). This research can inform school, district, and state policies on (a) embedding social and emotional programming within instruction, (b) the impact ego networks have on long-term outcomes for students with disabilities in inclusive settings, and (c) prioritizing funding to support social and emotional programming and the development of ego networks.

Researchers may also want to consider exploring how schools are using academic tracking policies, rather than specific disability labels, to place students into programs. Placement based on disability label is no longer accepted in the field and the push has been toward access to the general education curriculum in inclusive settings (IDEA 1997, 2004). However, schools may continue to use policies under different names to maintain the segregated systems that have dominated modern history. Specifically, academic tracking may serve to support the norms of school institutions in a way that “adequately serve(s) these preexisting differences” (Harris, 2011), based on technical (i.e., issues of staffing classes), political (i.e., it is more prestigious to teach more advanced classes), and norms (i.e., school history of tracking) of schools (Kelly, 2004; Loveless, 1999; Oakes, 1992; Page, 1991). Researchers need to consider how institutionalized segregation creates fewer opportunities not only for access and progress in the general curriculum (Cole, Waldron, & Majd, 2004; Cosier, Causton-Theoharis, & Theoharis, 2013), but also how it impacts social network development and access to social capital (Frank, Muller, & Mueller, 2013) including academic support (e.g., Crosnoe, Cavanagh, & Edler, 2003;
Fuchs, Fuchs, & Kazdan, 1999; Kalambouka, Farrell, & Dyson, 2007) and emotional support (Riegle-Crumb, Farkas, & Muller, 2006). These policies fundamentally influence post-school outcome domains.

**The Technological Divide**

Recent research has indicated that adolescents with and without disabilities primarily communicate with each other using technology (Cadwallader & Wagner, 2005; Subrahmanyam & Greenfield, 2008). In the last 5 years, adolescents have shifted to primarily using email, texting, cellphone, and social media (Reich, Subrahmanyam, & Espinoz, 2012). Adolescents use this technology to communicate socially and also to plan informal and formal social activities (Ling, 2010). In this study, all students reported using Information Communication Technology (ICT) to communicate with their friends, but students in the special education track communicated with their friends through texting and cellphones significantly less than students in both the co-taught and general education track. In fact, when asked this question, several students in both the functional (indicated verbally during the interview) and instructional (indicated on their survey) classes reported that they did not have access to a cellphone. No students in either the co-taught or the general education track indicated this on their survey. This is concerning given that recent research has indicated that 78% of teens have a cellphone (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013) and 54% of teens use texting as the primary means of communicating with their friends (Lenhart, Ling, Campbell, & Purcell, 2010). If students in the special education track are less likely to have access to the same technology as their age peers, this can significantly reduce their ability to identify and participate in social activities, particularly in informal social activities as texting is the primary means of communicating to schedule these types of activities (Ling, 2010).
While we did not examine why students in the special education track reported using a cellphone and texting friends less, other research on adults with disabilities suggests barriers related to access (physical and cognitive) and attitudes (e.g., parental; Bryen, Carey, Friedman, & Taylor, 2007; Tanis et al., 2012). For example, there may be accessibility barriers involving demands for both cognitive skills and fine motor skills that limit the use of ICT for students in the SPED track (see Stock et al., 2008; Stock et al., 2011; Tanis et al., 2012). There also may be parent/caregiver belief systems or skill levels that play a role in access to ICT for students with more intensive support needs. Research has shown, though, that after ICT training was implemented for a group of individuals with intellectual disability, parents and caregivers thought their family member could master ICT skills and thought the training was a useful skill to have (Ti-Tsang et al., 2007). Further research is needed on the exosystem (e.g., programming and teaching of technology use) or macrosystem factors (e.g., parent belief systems) that influence students’ use of this technology and the most appropriate ways to build systems of support that address access to these technologies. Based on this research, supports at the exosystem and macrosystem levels may be needed to address disparities.

Limitations

The findings from the present study provide important guidance for future research and practice, but there are inherent limitations to the scope of the research questions, the data collected, and the sample size, which must be considered in interpreting the findings. While social network analysis (i.e., whole network analysis) has been used extensively to examine the social status of adolescents with disabilities within the context of schools (see Carolan, 2014; Cillessen, 2007), ego network analysis has not. Because the ego network methodology used in this study did not use objective confirmation of reported network ties and alter characteristics or
alter-alter ties, the validity of responses (e.g., whether adolescents are accurate reporters of their ego networks) must be considered. Previous research has indicated that responses can be more valid if respondents are prompted to think about alters within a certain context before answering name generator questions (e.g., List 5 friends in your neighborhood). Respondents in this study were asked to indicate the peers who were important to them, with whom they had shared important information, or whom they had seen within the last month. By providing this context, respondents were cued to indicate the alters with whom they had the closest ties, making their responses more valid. Future researchers might consider other procedures, such as snowball sampling the alters listed by egos and confirming relationships through ego network measures (Carolan, 2014).

Despite this, ego network analysis is a useful methodology to assess the relational ties of individuals and how those ties influence opportunities for social connection by examining where the ties occur, across ecological systems (Wellman, 2007). As adolescents experience a variety of social contexts (e.g., changing classrooms/classmates for every class, participating in clubs/sports, working at an after-school job), analyzing social network memberships using whole network analysis (i.e., researcher created boundaries and analyses of relationships within those boundaries) may prove less useful. However, since ego network analysis has not readily been used in schools with this population, any findings and implications must be considered preliminary and further exploration with this population is needed.

The data collected and the data collection methods limit the representativeness of the results. Particularly, the research questions focused only on ego network structural characteristics and not on functional characteristics (i.e., the functions provided by the network to the ego). Without further information on functional characteristics, it is difficult to assess the actual
support provided to the ego and the benefits derived from particular ties. Future research should explore these functional characteristics and their relationship with structural characteristics.

Also, while classroom teachers administered the surveys to students in the general education, co-taught, and instructional classes (within the SPED track) using group-administration paper-and-pencil procedures, students in the special education classes (within the SPED track) used a computerized version of the tool, administered one-on-one by the researcher. This individualized administration could have confounded the results, although every effort was made to avoid influencing student responding by making the computerized Modified Student Survey 2 self-directed survey (voice activated with automatic verbal prompts – “next page”). This limited the need for direct interaction with the researcher. Further research is needed to explore instrumentation issues when sampling students with diverse characteristics.

Another limitation was the sampling procedures. Although a systematic sampling plan was developed, given the limited sample size of each academic track, any findings may not be generalizable to the larger adolescent population. The schools sampled may also have unique social structures that impact network characteristics. For instance, different schools may value highly connected networks differently; one school culture may perceive networks with high density as limiting brokerage opportunities (Burt, 1984; 1992) and another school culture may highly value the support or bonding social capital available in highly dense networks (Bourdieu, 1986; Putnam, 2000). Also, because the researcher recruited participants from large city-small communities, these findings may not reflect the pattern of results that would be obtained in smaller urban communities, suburban communities, or rural communities. These meso- and macro-system issues limit the generalizability of findings across schools within the same state or
across the country that have different social structures, as such variables were not systematically quantified and studied. Additional research is needed in this area.

Further, academic tracking was used as a proxy for access to inclusive opportunities, a challenging academic curriculum, and disability label and support needs. Although the schools included in this study clearly used support needs to define access and curricular opportunities for students with disabilities, it is likely that these factors interact in highly complex ways. For example, students may be more isolated both because of a lack of inclusive opportunities, and also because of a lack of access to challenging curriculum content which may limit their shared experiences (e.g., reading the same book in class) and opportunities (e.g., participating on a debate team). Additionally, school contacts reported that external factors influenced placement decisions (e.g., parent advocacy) and there are likely complex relationships between student level characteristics (e.g., race/ethnicity, socioeconomic status, ego networks) that were not fully explored in these analyses.

Interestingly, although “crowd” membership is frequently discussed in the literature on adolescent relationships (Brown & Klute, 2003; Brown, Morey, & Kinney, 1994; Emler & Reicher, 1995) as influencing the types of activities in which adolescents engage (Eccles et al., 2003), it had limited significance in the analyses. In fact, several students wrote on their surveys that the groups frequently identified in the literature (i.e., jock, brain) did not make sense or were not relevant to them. Research is needed to explore the ongoing relevance of crowd membership to the lives of adolescents, particularly in a time of significant changes in ICT use and types of formal and informal social activities available and culturally acceptable to adolescents.

Finally, the rapid change of ICT technology and adolescents’ usage of ICT need to be considered when interpreting these data. Given that technology usage changes so rapidly, the
applicability of these results and the results of similar studies are limited. Researchers should consider this when designing research questions and studies that address ICT for adolescents with and without disabilities by keeping up-to-date on ICT trends (e.g., utilizing nationally representative data such as the Pew Research Center; Ling, 2010).

**Conclusion**

The purpose of this study was to develop and test a social capital model that examines how individual characteristics (i.e., gender, race/ethnicity, grade, crowd membership, and information communication technology use - ICT) and institutional policies (i.e., school-based academic tracking policies based on disability) impact the formation of social capital through social networks. Differences in ego network structural characteristics, ICT use, and formal and informal social activities were seen between students in the special education track and the co-taught and general education tracks. Differences were not seen between students in the co-taught or general education tracks, suggesting a powerful impact of segregated placement on social networks. These findings are preliminary and are in need of replication. Further analyses of the various individual and institutional factors that predict variability in outcomes are needed. Future research and practice should consider the use of ego network methodologies, practitioner focused-interventions to address network creation, and an examination of the detrimental impact institutional policies such as academic tracking can have on adolescent ego networks and outcomes. Much work remains in the area of social networks our how those networks impact long-term outcomes for adolescents with and without disabilities.
References


doi:10.1080/02687030600798162


doi:10.1016/0378-8733(84)90007-8


doi:10.1080/07434619112331275753

doi:10.1177/0044118X88020001003


doi:10.1177/0143034300211002

doi:10.1177/0272431685053007


Stone, M. R., Barber, B. L. & Eccles, J. S. (2005) Positive friendship network characteristics associated with varying types of extracurricular activity participation. Atlanta, GA:

Society for Research on Child Development Conference.


http://www.who.int/classifications/icf/en/


http://search.proquest.com/docview/881465828?accountid=14553
Appendix A

Recruitment Materials
Are students with disabilities included in peer social networks?

Are students with and without disabilities included in peer social networks together?

Researchers from the University of Illinois at Urbana-Champaign Department of Special Education are interested in learning how high school students with and without disabilities form peer social networks. The researchers will examine how students, with and without disabilities, are included in social networks, what factors contribute to peer social network membership, and whether networks predict social activity. Participation involves students with and without disabilities completing a one-time 20-minute questionnaire.

If you do not want your child to participate you can let your child’s teacher know or please contact Kim Fisher of the University of Illinois at Urbana-Champaign, Department of Special Education at kwolow1@illinois.edu. She can also be reached at 847-347-0394 or 217-333-0260.

All families, regardless or whether or not they participate, will be entered into a lottery to win a $25 gift card to Amazon. One winner from your child's school will be selected.
Dear Dr./Mrs./Mr. XXX,

My name is Kim Fisher and I am a doctoral student in the Department of Special Education at the University of Illinois. I am conducting my dissertation study on social networks and am writing to determine whether District 225 might be interested in participating. I am interested in your district because of its reputation of strong support services and diverse extracurricular programming.

Preliminary research on adolescents shows that social network membership is important to long-term outcomes on employment, education, independent living, and social inclusion. In this project, I am interested in understanding how high school students, with and without disabilities, experience social network membership, where they make their connections and for what reasons, and which students connect groups of students together and how. While exploratory, this data may provide important information to direct future interventions.

The study has 1 required part and 3 optional parts depending on your district's interest and availability.

**Required (20 minutes of student time):**
- Participating students (with and without disabilities) will complete a one-time 20-minute survey. We will randomly select 2-3 English/Reading classes across academic level (accelerated/AP, general education, special education) in each grade (n = approximately 100 per grade). Teachers or research staff can administer the surveys. Student will receive a U of I pencil.

**Optional (15-30 minutes of teacher time – voluntary):**
- With parent permission, teachers or case managers will (1) complete a social skills rating scale on participating students with disabilities and (2) assist project staff in collecting a copy of current IEPs of participating students whose parents provide permission. For their assistance, teachers will receive a $5 Starbucks gift card.
- Teachers and administrators are invited to participate in a 20-minute interview on their perspectives of facilitators and barriers to adolescent social network membership. Participants will receive a $5 Starbucks gift card.

To schools that participate, I will donate *Peer Buddy Programs: For Successful Secondary School Inclusion (2008)* by Carolyn Hughes and Erik Carter. This resource has many make-and-take ideas for utilizing peers to improve the social lives of students with disabilities. Once all data is analyzed, I can share the information in a report or a presentation to school staff and/or the school community.

If District XXX may be interested, you can respond to this email indicating so and I will be in touch with more detailed information.

I hope to work with your school on this endeavor. Thank you for considering my request.

Sincerely,
Kim Fisher
Appendix B

Institutional Review Board Approval and Consent Letters
Office of the Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820

March 11, 2014

Michaelene Ostrosky
Special Education
Education Bldg
1310 S Sixth St
MC 708

RE: Egocentric networks of adolescents with and without disabilities across academic track:
Conditions and impact on communication technology usage and formal and informal social activity
IRB Protocol Number: 12635

Dear Dr. Ostrosky:

This letter authorizes the use of human subjects in your continuing project entitled Egocentric networks of adolescents with and without disabilities across academic track: Conditions and impact on communication technology usage and formal and informal social activity. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) approved the protocol as described in your IRB-1 application, by expedited continuing review. The expiration date for this protocol, UIUC number 12635, is 03/10/2015. The risk designation applied to your project is no more than minimal risk. Certification of approval is available upon request.

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our Web site at http://www.irb.illinois.edu.

Sincerely,

Anita Balgopal, PhD
Director, Institutional Review Board

Attachment(s)

C: Kimberly Wołowicz-Fisher
Date

Hi! We are from the University of Illinois at your school to do a project on peer relationships. We are interested in the social networks of students in your school. At the end of the project, we hope to better understand the social networks of youth. We would like to include you in this project.

If you choose to participate, you will complete a confidential questionnaire about the friends you have in school and the friendship groups of others. You will also provide information about your experiences interacting with individuals with disabilities. You will complete the confidential questionnaire once. The questionnaire will take approximately 10 minutes to complete.

Your participation in this project is voluntary—this means that you can decide whether or not you want to do this project. If you decide not to do this project, that is okay. All the information you say in the questionnaire will be kept private and secure. To do this, we will assign a secret code to your name. Any information you share will be recorded using this code and not your name. This will keep your information private.

This project will not go on your school record or count toward your grades. If you decide not to participate in this project, that is okay.

If you decide to participate in this project, please check the box below and sign and print your name. You can return the form to your teacher. You can ask your teacher for a copy of this form if you would like.

If you have any questions, you can ask your teacher or Ms. Fisher when she comes to your class.

Thank you,

Kim Wołowicz Fisher, M.Ed.
Doctoral Candidate
Department of Special Education
University of Illinois at Urbana-Champaign
(217) 333-0260
kwolow1@illinois.edu

Karrie A. Shogren, Ph.D.
Associate Professor, Special Education
Associate Director, Kansas University Center on Developmental Disabilities
Associate Scientist, Beach Center on Disability
University of Kansas
785-864-8044
 karrie@ku.edu

Telephone: 217-333-0260 • Fax 217-333-6555
Study Participation

Please read the statements below and check the appropriate boxes. You can return this form to your teacher.

☐ I have read and understand the above information.

☐ I want to participate in this project.

☐ I do not want to participate in this project.

Date

Signature

Name (print)

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

APR 16 2014
Date

Dear Parent/Guardian:

We are writing you about a research project being conducted at your child’s school that seeks to understand the social groups that adolescents with and without disabilities experience. At the end of this project, we hope to understand how social groups are formed at this age in this school. The investigator is Kim W. Fisher, a doctoral student in the Department of Special Education at the University of Illinois at Urbana-Champaign (UIUC). Dr. Michaelene Ostrosky, Head and Professor of the Department of Special Education at UIUC, serves as the Responsible Project Investigator. Dr. Karrie Shogren, Associate Professor of Special Education at the University of Kansas, serves as the project supervisor. Dr. James Halle, Professor Emeritus, also from the Department of Special Education at UIUC serves as an advisor to the project. We would like to include your child in our study. Your child will also receive a letter in class that provides information about the study and allows for him/her to indicate whether or not he/she wishes to participate.

In this study, your child will complete a confidential questionnaire about their peer relationships and their experiences interacting other students. Questionnaires will be completed at one time during English class. Questionnaires take approximately 15-20 minutes to complete.

Your child’s participation is voluntary; he/she has the right to agree or not to participate. We do not anticipate your child will experience any risk greater than what would occur in a normal school day. Additionally, your child’s participation or not will not affect his/her grade, educational program, or status at the school. We will watch to see how comfortable your child is while completing the questionnaire. If your child tells, or shows us in any way that he/she does not want to participate, we will stop the questionnaire.

All information that we gather during this research project will be kept secure. The information will not become a part of your child’s school record. We will use the identity codes to keep your child’s information private. After all data are analyzed, we will destroy the identity code information.

We may share the information learned from this project with others. For example, we may write an educational report or journal articles. We may also provide teacher trainings through presentations. Pretend names or codes will be used instead of the names of the adolescents or the school.

Your child is automatically enrolled in the project. If you do not want your child to participate, you can indicate so below by checking the box below. Please print and sign the form and indicate your child’s name. We will use this information to ensure your child does not participate. You
can return this form to the school’s main office. Alternatively, you can contact your child’s
school or Kim Fisher at kwolow1@illinois.edu or 217-333-0260. If you have any questions
about this research project, please feel free to contact us either by mail, e-mail, or telephone.

Finally, all potential participants, whether or not they agree to participate, will be entered into a
lottery to win a $25 gift card to Amazon. One winner will be randomly drawn once the data are
all gathered. Thank you, in advance, for your consideration.

Sincerely,

Kim Wolowicz Fisher, M.Ed.
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James Halle, Ph.D.
Professor Emeritus, Special Education
University of Illinois at Urbana-Champaign
(217) 333-0260
halle@illinois.edu

☐ I do not want my child to participate in this study.

Date

Parent’s signature

Name (print)

Child’s name (print)

If you have any questions about your son or daughter’s rights as a participant in this study or any
concerns or complaints, please contact the University of Illinois Institutional Review Board at
217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or
via email at irb@illinois.edu.

APR 16 2014
Estimados padres y guardianes:
Le escribimos para informarles acerca de un proyecto de investigación que se está realizando en la escuela de su niño/a. El estudio trata de comprender los grupos sociales que experimentan los adolescentes con y sin minusvalía. Al final de este proyecto, esperamos comprender cómo se forman los grupos sociales a esta edad en esta escuela. La investigadora es la señora Kim W. Fisher, estudiante de doctorado en el departamento de educación especial en la Universidad de Illinois en Urbana- Champaign (UIUC). La Dra. Michaelene Ostrosky, jefe y profesora del departamento de educación especial en UIUC, sirve como la investigadora del Proyecto Responsable. La Dra. Karrie Shogren, profesora asociada de educación especial en la Universidad de Kansas, sirve como la supervisora del proyecto. El Dr. James Halle, profesor emérito, también del departamento de educación especial en UIUC sirve como asesor del proyecto. Nos gustaría incluir a su hijo/a en nuestro estudio. Su hijo/a recibirá una carta en clase que le proporcionará información acerca del estudio, y le permitirá la oportunidad de que él/ella indique si él/ella desea participar.

En este estudio, él o ella completará un cuestionario confidencial acerca de sus relaciones con sus compañeros y sus experiencias cuando interactúan con otros estudiantes. Los cuestionarios serán completados en una vez durante la clase de inglés. El cuestionario tomará aproximadamente 15 a 20 minutos para completar.

La participación de su hijo/a es voluntaria, él/ella tiene derecho de aceptar o no la invitación a participar. No anticipamos que su hijo/a vaya a experimentar ningún riesgo mayor que lo que ocurriría en un día escolar normal. Además, la participación o no de su hijo/a no va a afectar sus notas, su programa educativo, o su estatus en la escuela. Veremos a ver lo cómodo que su hijo/a se siente mientras completa el cuestionario. Si su hijo/a nos dice o nos demuestra de alguna manera de que él/ella no quiere participar, deteneremos el cuestionario.

Todo la información que recogamos durante este proyecto de investigación se mantendrá segura. La información no se convertirá en parte del expediente escolar de su hijo/a. Utilizaremos códigos de identidad para mantener la información de su niño/a privada. Después de que todos los datos sean analizados, destruiremos la información del código de identidad.

Tendremos oportunidad de compartir la información obtenida de este proyecto con otros. Por ejemplo, podríamos escribir un informe educativo o artículos para revistas educativas. También podríamos ofrecer entrenamientos a maestros a través de presentaciones. Nombres distintos o códigos se utilizarán en lugar de los nombres de los adolescentes o de la escuela.

Su hijo/a está inscrito automáticamente en el proyecto. Si usted no desea que su hijo/a participe, puede indicarlo a continuación marcando la casilla de abajo. Por favor imprima y firme el formulario e indique el nombre de su hijo/a. Usaremos esta información para asegurarnos de que su hijo/a no participe. Uds. pueden regresar el formulario a la maestra/o de su hijo/a. Como alternativa, puede ponerse en contacto con la escuela de su hijo o con Kim Fisher en kwolow1@illinois.edu o (217)333-0260. Si usted tiene alguna pregunta acerca de este proyecto de investigación, por favor no dude en ponerse en contacto con nosotros, ya sea por correo postal, correo electrónico o por teléfono.

Por último, todos los/las participantes potenciales, estén o no estén de acuerdo en Interact, entrarán en un sorteo para ganar una tarjeta de regalo de $25 en Amazon. Un ganador/a será elegido al azar una vez que los datos hayan sido compilados. Gracias, de antemano, por su consideración.

Atentamente,
No quiero que mi hijo/a participe en este estudio.

[ ]

_______ Fecha ________________________________ Firma del padre o guardián

_______________________________ Nombre (imprima)

_______________________________ Nombre de niño/a (imprima)
Appendix C

Teacher Script
Thank you for assisting me in this project. I appreciate you freeing up class time to complete our survey. In order to ensure the survey is administered systematically across environments, we have provided step-by-step instructions and a script (in bold). If you have any questions while administering the survey, text/call Kim Fisher at 847-347-0394. Thank you.

Instructions & Script

Step 1: Pass out the assent letter and the survey.

Step 2: Please ready the following instructions to the students.

Researchers from the University of Illinois Department of Special Education are conducting a research study examining the social relationships of randomly selected students in our school. Your parent/guardian has given permission for you to participate. As part of the project, I have passed out 2 items from the researchers: a letter and a survey packet. The letter explains the study and requires you to indicate whether or not you want to participate. I will now read the letter out loud (read the letter). If you want to participate, check yes. If you do not want to participate, check no. Finally, please print and sign your name in the space provided.

If you indicated NO, please keep your questionnaire until we are finished. If you indicated YES, please listen to the following instructions before you begin.

At the top of the first page, please write your first and last name. This is the ONLY page you will write your name.

Page 2. The survey begins on page 2. Turn to page 2. In questions 1 – 5, you are asked information about you (gender, age, grade, etc.). In Question 6, you are asked the following questions: “Are there groups of kids who hang out together a lot? Who are they?” Write the names of the group members in each box. These groups can but do not have to include yourself.

Pages 3-5. Turn to page 3. Question 7 is on pages 3-5. In question 7, you share information about the peers you hang out with a lot or who are important to you. You can write In each row, you will list your friend’s first name and then answer a series of questions about that friend. The questions about each friend include: name, gender, grade, race, has/does not have a disability, how you know this friend, how often you see this friend, how close you are to this friend, how long you have known this friend. Finally, you will indicate whether this friend is friends with your other friends (yes/no). Then, list the names of the friends this person is friends with. List as many or as few friends you want.

Page 6. Turn to page 6. Questions 8-15 are on page 6. In question 8-11, you indicate how and how often you communicate with your friends via landline, cell phone, email, or texting. In questions 12-15, you will indicate how often you hang out with your friends at home or at school.

Are there any questions? Turn to page 2. Please complete each question and keep your responses confidential or to yourself. You may begin.

At this point, instruct the students on what to do when they finish the questionnaire (e.g., turn in letter & questionnaire right away; hold onto it until everyone is finished). Please make sure the student has put his/her name on the survey and answered each question. PLEASE PUT A DOT ON SURVEYS BY STUDENTS WITH IEPs. Put questionnaire packets into the file folder labeled UIUC study. You may return the letters and surveys to Kim Fisher or put them in the box labeled UIUC study located in the school office. Thank you for your assistance. ~ Kim
Appendix D

Student Survey of Social Networks
### General Information

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<td><strong>2. How old are you?</strong></td>
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<td>21 years</td>
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<td><strong>3. What grade are you in?</strong></td>
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<td>10th grade (sophomore)</td>
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<td>11th grade (junior)</td>
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<td>12th grade (senior)</td>
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<td>Other</td>
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<td><strong>4. What race/ethnicity do you most identify with?</strong></td>
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<td>American Indian</td>
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<td>Multiracial</td>
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<td><strong>5. To which crowd do you feel you belong to? Check all that apply.</strong></td>
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<td>Jock</td>
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<td>Outcast</td>
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</table>
|   | Other (please specify)  

6. **Are there groups of kids who hang out together a lot? Who are they?** Write in the boxes below the first and last names of groups of students who hang out together a lot. If you need more space, use the back of this sheet.

**Example.**
Sadie Smith  
Lizzy Weigand  
Olivia Newtoff  
Amy Rogers
7. List the names of **peers** you **hang out with a lot** or who are **important to you** or have provided you some sort of support in the past month. They could peers you hang out with, participate in clubs/organization with, or peers in your classes. Tell us how often you see that person and how close you feel to them. **YOU CAN WRITE AS MANY OR AS FEW AS YOU WANT.**

<table>
<thead>
<tr>
<th>Name (FIRST NAMES ONLY)</th>
<th>Gender</th>
<th>Grade</th>
<th>Race</th>
<th>Does this person have a disability?</th>
<th>How do you know this person?</th>
<th>How often do you see this person?</th>
<th>How close to this person do you feel?</th>
<th>How long have you known this person?</th>
<th>Is this person a friend with your other friends?</th>
<th>List the names of the friends this person is friends with.</th>
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<tbody>
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<td>A few times per year</td>
<td>Very close</td>
<td>A week</td>
<td>Yes</td>
<td>Isaac, Helen, Felix (Example)</td>
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<td>Female</td>
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<td>Am. Indian</td>
<td>No</td>
<td>Classmate</td>
<td>Monthly</td>
<td>A month</td>
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<table>
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<th>Name (FIRST NAMES ONLY)</th>
<th>Gender</th>
<th>Grade</th>
<th>Race</th>
<th>Does this person have a disability?</th>
<th>How do you know this person?</th>
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<tr>
<td>Male Female</td>
<td>9th</td>
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<td>Asian</td>
<td>Yes No</td>
<td>Friends' group Classmate Teacher</td>
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<td>Not very close Sort of close Very close</td>
<td>A week A month One year Several years</td>
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<td>Not very close Sort of close Very close</td>
<td>A week A month One year Several years</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Male Female</td>
<td>9th</td>
<td>10th</td>
<td>Black Hispanic White Multiracial</td>
<td>Yes No</td>
<td>Friends' group Classmate Teacher</td>
<td>Never A few times per year Monthly Weekly Daily</td>
<td>Not very close Sort of close Very close</td>
<td>A week A month One year Several years</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Male Female</td>
<td>11th</td>
<td>12th</td>
<td>Am. Indian Hispanic White Multiracial</td>
<td>Yes No</td>
<td>Friends' group Classmate Teacher</td>
<td>Never A few times per year Monthly Weekly Daily</td>
<td>Not very close Sort of close Very close</td>
<td>A week A month One year Several years</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Male Female</td>
<td>9th</td>
<td>10th</td>
<td>Hispanic White Multiracial</td>
<td>Yes No</td>
<td>Friends' group Classmate Teacher</td>
<td>Never A few times per year Monthly Weekly Daily</td>
<td>Not very close Sort of close Very close</td>
<td>A week A month One year Several years</td>
<td>Yes No</td>
<td></td>
</tr>
</tbody>
</table>
Identity code ____________

In the following questions, we want to know how and how often you communicate with your friends.

8. How many friends do you call by LANDLINE PHONE?

<table>
<thead>
<tr>
<th>HOW OFTEN?</th>
<th>NUMBER OF FRIENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>Once per week</td>
<td></td>
</tr>
<tr>
<td>Several times per week</td>
<td></td>
</tr>
<tr>
<td>Once per day</td>
<td></td>
</tr>
<tr>
<td>Several times per day</td>
<td></td>
</tr>
</tbody>
</table>

9. How many friends and how often do you call by CELLPHONE?

<table>
<thead>
<tr>
<th>HOW OFTEN?</th>
<th>NUMBER OF FRIENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>Once per week</td>
<td></td>
</tr>
<tr>
<td>Several times per week</td>
<td></td>
</tr>
<tr>
<td>Once per day</td>
<td></td>
</tr>
<tr>
<td>Several times per day</td>
<td></td>
</tr>
</tbody>
</table>

10. How many friends and how often do you EMAIL?

<table>
<thead>
<tr>
<th>HOW OFTEN?</th>
<th>NUMBER OF FRIENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>Once per week</td>
<td></td>
</tr>
<tr>
<td>Several times per week</td>
<td></td>
</tr>
<tr>
<td>Once per day</td>
<td></td>
</tr>
<tr>
<td>Several times per day</td>
<td></td>
</tr>
</tbody>
</table>

11. How many friends and how often do you TEXT?

<table>
<thead>
<tr>
<th>HOW OFTEN?</th>
<th>NUMBER OF FRIENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once per month</td>
<td></td>
</tr>
<tr>
<td>Once per week</td>
<td></td>
</tr>
<tr>
<td>Several times per week</td>
<td></td>
</tr>
<tr>
<td>Once per day</td>
<td></td>
</tr>
<tr>
<td>Several times per day</td>
<td></td>
</tr>
</tbody>
</table>

In the following questions, we want to know about the social activities in which you participate.

12. With how many friends do you hang out at YOUR HOUSE OR A FRIEND’S HOUSE?

________________________________________________________________________________

13. How many times per week do you hang out at YOUR HOUSE OR A FRIEND’S HOUSE?

________________________________________________________________________________

14. With how many friends do you hang out with at SCHOOL ACTIVITIES (e.g., school clubs, activities)?

________________________________________________________________________________

15. How many times per week do you hang out with your friends at SCHOOL ACTIVITIES (e.g., school clubs, team sports)?

________________________________________________________________________________

Thank you for participating in our study. We appreciate you sharing your experiences.
Appendix E

Modified Student Survey of Social Networks
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Gender</strong></td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td><strong>2. How old are you?</strong></td>
</tr>
<tr>
<td>14 years</td>
</tr>
<tr>
<td>15 years</td>
</tr>
<tr>
<td>16 years</td>
</tr>
<tr>
<td>17 years</td>
</tr>
<tr>
<td>18 years</td>
</tr>
<tr>
<td>19 years</td>
</tr>
<tr>
<td>20 years</td>
</tr>
<tr>
<td>21 years</td>
</tr>
<tr>
<td><strong>3. What grade are you in?</strong></td>
</tr>
<tr>
<td>9th grade (freshman)</td>
</tr>
<tr>
<td>10th grade (sophomore)</td>
</tr>
<tr>
<td>11th grade (junior)</td>
</tr>
<tr>
<td>12th grade (senior)</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>4. What race/ethnicity are you?</strong></td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>American Indian</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Multiracial</td>
</tr>
<tr>
<td><strong>5. To which crowd do you feel you belong to? Check all that apply.</strong></td>
</tr>
<tr>
<td>Popular</td>
</tr>
<tr>
<td>Jock</td>
</tr>
<tr>
<td>Brain</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Tough</td>
</tr>
<tr>
<td>Outcast</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>
Part II. Groups

6. Are there groups of kids who hang out together a lot? Who are they?
   Write in the boxes below the first and last names of groups of students who hang out together a lot. If you need more space, use the back of this sheet.

<table>
<thead>
<tr>
<th>Example.</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sadie S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lizzy W.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olivia N.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amy R.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Part III. Friends.

List the names of friends you **hang out with a lot** or who are **important to you** or have provided you some sort of support in the past month. Please write your answer or check the boxes.

1. **Friend 1:** What is your friend’s name?

2. What is this friend’s gender?
   - [ ] Female
   - [ ] Male

3. How old is this friend?
   - [ ] 14 years
   - [ ] 15 years
   - [ ] 16 years
   - [ ] 17 years
   - [ ] 18 years
   - [ ] 19 years
   - [ ] 20 years
   - [ ] 21 years

4. What grade is this friend in?
   - [ ] 9th grade (freshman)
   - [ ] 10th grade (sophomore)
   - [ ] 11th grade (junior)
   - [ ] 12th grade (senior)
   - [ ] Other

5. What race is your friend?
   - [ ] Asian
   - [ ] Black or African-American
   - [ ] Hispanic
   - [ ] White
   - [ ] American Indian
   - [ ] Multiracial

6. Does this friend have a disability?
   - [ ] Yes
   - [ ] No

7. How do you know this friend?
   - [ ] From other friends
   - [ ] Clubs or organizations
   - [ ] Classmate
   - [ ] Neighbor
   - [ ] Teacher

8. How often do you see this friend?
   - [ ] Never
   - [ ] Weekly
   - [ ] A few times per year
   - [ ] Daily
   - [ ] Monthly

9. How close do you feel to this friend?
   - [ ] Not very close
   - [ ] Sort of close
   - [ ] Very close

10. How long have you known this friend?
    - [ ] A week
    - [ ] A month
    - [ ] One year
    - [ ] Several years

11. Is this friend a friend of your other friends?
    - [ ] Yes
    - [ ] No

12. List the names of the friends this person is friends with?
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Friend 2</strong>: What is your friend’s name?</td>
</tr>
<tr>
<td>2.</td>
<td>What is this friend’s gender?</td>
</tr>
<tr>
<td></td>
<td>□ Female</td>
</tr>
<tr>
<td></td>
<td>□ Male</td>
</tr>
<tr>
<td>3.</td>
<td>How old is this friend?</td>
</tr>
<tr>
<td></td>
<td>□ 14 years</td>
</tr>
<tr>
<td></td>
<td>□ 15 years</td>
</tr>
<tr>
<td></td>
<td>□ 16 years</td>
</tr>
<tr>
<td></td>
<td>□ 17 years</td>
</tr>
<tr>
<td></td>
<td>□ 18 years</td>
</tr>
<tr>
<td></td>
<td>□ 19 years</td>
</tr>
<tr>
<td></td>
<td>□ 20 years</td>
</tr>
<tr>
<td></td>
<td>□ 21 years</td>
</tr>
<tr>
<td>4.</td>
<td>What grade is this friend in?</td>
</tr>
<tr>
<td></td>
<td>□ 9th grade (freshman)</td>
</tr>
<tr>
<td></td>
<td>□ 10th grade (sophomore)</td>
</tr>
<tr>
<td></td>
<td>□ 11th grade (junior)</td>
</tr>
<tr>
<td></td>
<td>□ 12th grade (senior)</td>
</tr>
<tr>
<td></td>
<td>□ other</td>
</tr>
<tr>
<td>5.</td>
<td>What race is your friend?</td>
</tr>
<tr>
<td></td>
<td>□ Asian</td>
</tr>
<tr>
<td></td>
<td>□ American Indian</td>
</tr>
<tr>
<td></td>
<td>□ Black or African-American</td>
</tr>
<tr>
<td></td>
<td>□ Hispanic</td>
</tr>
<tr>
<td></td>
<td>□ White</td>
</tr>
<tr>
<td></td>
<td>□ Multiracial</td>
</tr>
<tr>
<td>6.</td>
<td>Does this friend have a disability?</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
</tr>
<tr>
<td></td>
<td>□ No</td>
</tr>
<tr>
<td>7.</td>
<td>How do you know this friend?</td>
</tr>
<tr>
<td></td>
<td>□ From other friends</td>
</tr>
<tr>
<td></td>
<td>□ Classmate</td>
</tr>
<tr>
<td></td>
<td>□ Neighbor</td>
</tr>
<tr>
<td></td>
<td>□ Teacher</td>
</tr>
<tr>
<td>8.</td>
<td>How often do you see this friend?</td>
</tr>
<tr>
<td></td>
<td>□ Never</td>
</tr>
<tr>
<td></td>
<td>□ Weekly</td>
</tr>
<tr>
<td></td>
<td>□ A few times per year</td>
</tr>
<tr>
<td></td>
<td>□ Daily</td>
</tr>
<tr>
<td></td>
<td>□ Monthly</td>
</tr>
<tr>
<td>9.</td>
<td>How close do you feel to this friend?</td>
</tr>
<tr>
<td></td>
<td>□ Not very close</td>
</tr>
<tr>
<td></td>
<td>□ Sort of close</td>
</tr>
<tr>
<td></td>
<td>□ Very close</td>
</tr>
<tr>
<td>10.</td>
<td>How long have you known this friend?</td>
</tr>
<tr>
<td></td>
<td>□ A week</td>
</tr>
<tr>
<td></td>
<td>□ A month</td>
</tr>
<tr>
<td></td>
<td>□ One year</td>
</tr>
<tr>
<td></td>
<td>□ Several years</td>
</tr>
<tr>
<td>11.</td>
<td>Is this friend a friend of your other friends?</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
</tr>
<tr>
<td></td>
<td>□ No</td>
</tr>
<tr>
<td>12.</td>
<td>List the names of the friends this person is friends with?</td>
</tr>
</tbody>
</table>
13. **Friend 3:** What is your friend’s name?

14. What is this friend’s gender?
- Female
- Male

15. How old is this friend?
- 14 years
- 15 years
- 16 years
- 17 years
- 18 years
- 19 years
- 20 years
- 21 years

16. What grade is this friend in?
- 9th grade (freshman)
- 10th grade (sophomore)
- 11th grade (junior)
- 12th grade (senior)
- other

17. What race is your friend?
- Asian
- Black or African-American
- Hispanic
- White
- American Indian
- Multiracial

18. Does this friend have a disability?
- Yes
- No

19. How do you know this friend?
- From other friends
- Clubs or organizations
- Classmate
- Neighbor
- Teacher

20. How often do you see this friend?
- Never
- A few times per year
- Daily
- Monthly

21. How close do you feel to this friend?
- Not very close
- Sort of close
- Very close

22. How long have you known this friend?
- A week
- A month
- One year
- Several years

23. Is this friend a friend of your other friends?
- Yes
- No

24. List the names of the friends this person is friends with:
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Friend 4: What is your friend’s name?</td>
<td></td>
</tr>
<tr>
<td>2. What is this friend’s gender?</td>
<td>Female, Male</td>
</tr>
<tr>
<td>3. How old is this friend?</td>
<td>14 years, 15 years, 16 years, 17 years, 18 years, 19 years, 20 years, 21 years</td>
</tr>
<tr>
<td>4. What grade is this friend in?</td>
<td>9th grade, 10th grade, 11th grade, 12th grade, other</td>
</tr>
<tr>
<td>5. What race is your friend?</td>
<td>Asian, American Indian, Black or African-American, Hispanic, White, Multiracial</td>
</tr>
<tr>
<td>6. Does this friend have a disability?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>7. How do you know this friend?</td>
<td>From other friends, Classmate, Teacher, Clubs or organizations, Neighbor</td>
</tr>
<tr>
<td>8. How often do you see this friend?</td>
<td>Never, Weekly, A few times per year, Daily, Monthly</td>
</tr>
<tr>
<td>9. How close do you feel to this friend?</td>
<td>Not very close, Sort of close, Very close</td>
</tr>
<tr>
<td>10. How long have you known this friend?</td>
<td>A week, A month, One year, Several years</td>
</tr>
<tr>
<td>11. Is this friend a friend of your other friends?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>12. List the names of the friends this person is friends with?</td>
<td></td>
</tr>
</tbody>
</table>
1. **Friend 5**: What is your friend’s name?

2. What is this friend’s gender?
   - Female
   - Male

3. How old is this friend?
   - 14 years
   - 15 years
   - 16 years
   - 17 years
   - 18 years
   - 19 years
   - 20 years
   - 21 years

4. What grade is this friend in?
   - 9th grade (freshman)
   - 10th grade (sophomore)
   - 11th grade (junior)
   - 12th grade (senior)
   - other

5. What race is your friend?
   - Asian
   - Black or African-American
   - Hispanic
   - White
   - Multiracial

6. Does this friend have a disability?
   - Yes
   - No

7. How do you know this friend?
   - From other friends
   - Clubs or organizations
   - Classmate
   - Neighbor
   - Teacher

8. How often do you see this friend?
   - Never
   - A few times per year
   - Weekly
   - Daily
   - Monthly

9. How close do you feel to this friend?
   - Not very close
   - Sort of close
   - Very close

10. How long have you known this friend?
    - A week
    - A month
    - One year
    - Several years

11. Is this friend a friend of your other friends?
    - Yes
    - No

12. List the names of the friends this person is friends with?
Part IV. Activities: In the following questions, we want to know how and how often you communicate with your friends.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| 13. HOW MANY FRIENDS do you call by LANDLINE PHONE … (for example: 1, 3, or 10 friends) | • Once per month? ____________
• Once per week? ____________
• Several times per week? ____________
• Once per day? ____________
• Several times per day? ____________ |
| 14. How many friends do you call by CELLPHONE … (for example: 1, 3, or 10 friends) | • Once per month? ____________
• Once per week? ____________
• Several times per week? ____________
• Once per day? ____________
• Several times per day? ____________ |
| 15. How many friends do you EMAIL … (for example: 1, 3, or 10 friends) | • Once per month? ____________
• Once per week? ____________
• Several times per week? ____________
• Once per day? ____________
• Several times per day? ____________ |
| 16. How many do you TEXT… (for example: 1, 3, or 10 friends) | • Once per month? ____________
• Once per week? ____________
• Several times per week? ____________
• Once per day? ____________
• Several times per day? ____________ |

In the following questions, we want to know about the social activities in which you participate.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. With how many friends do you hang out at YOUR HOUSE OR A FRIEND’S HOUSE?</td>
<td>__________________________________________________________________________________</td>
</tr>
<tr>
<td>18. How many times per week do you hang out at YOUR HOUSE OR A FRIEND’S HOUSE?</td>
<td>__________________________________________________________________________________</td>
</tr>
<tr>
<td>19. With how many friends do you hang out with at SCHOOL ACTIVITIES (e.g., school clubs, activities)?</td>
<td>__________________________________________________________________________________</td>
</tr>
<tr>
<td>20. How many times per week do you hang out with your friends at SCHOOL ACTIVITIES (e.g., school clubs, team sports)?</td>
<td>__________________________________________________________________________________</td>
</tr>
</tbody>
</table>

Thank you for participating in our study. We appreciate you sharing your experiences.
Appendix F

Modified Student Survey of Social Networks 2
Student Social Network Survey

DIRECTIONS:
1. Read the question or click on the text box to have the text read to you.
2. Answer the question by typing your answer or using the buttons located on the page.
3. Go to the next page. You can use the arrow buttons at the bottom to turn the pages forward or backward.
4. Continue answering each question on each page.
5. On the last page, click on the FINISH ACTIVITY button.
6. Tell the teacher or Ms. Fisher when you are finished.
1. Are you a boy or a girl?

2. How old are you?
3. What grade are you in?
- 9th
- 10th
- 11th
- 12th
- Other

4. What race or ethnicity are you?
- Asian
- African American
- White
- American Indian
- Latino or Latina
- Multiracial
- I don't know
6. Are there **GROUPS OF KIDS** who hang out together a lot? Who are they?

Write the names of groups of students in the boxes below. You don't have to fill in each group. If you need more room, let Mr. Fisher or your teacher know.

Example: Amy Rogers, Olivia Weigand, Iman DeBurst, and Kennedy Fisher

- Group A
- Group B
- Group C
- Group D

I don't know

---

**Part 3:**

**My Friends**
1. Friend's name

Is this friend a boy or a girl?
How old is your friend?

14  15  16  17

18  19  20  21

I don't know

What grade is your friend in?

9th  10th  11th  12th

Other

I don't know
How much do you like this friend?

A lot  A little

How long have you known this friend?

A long time  A short time

I don't know
Is this person a friend with your other friends?

Yes  no

Name the other friends this person is friends with.

I don't know
Do you have more friends?

Yes

no

I don't know

1. Friend’s name

I don’t know
Is this friend a boy or a girl?

How old is your friend?

14  15  16  17
18  19  20  21
What grade is your friend in?

- 9th
- 10th
- 11th
- 12th
- Other

How do you know this friend?

- School
- Neighborhood
- Sports or activities
- Something different
- I don’t know
How often do you see this friend?

- A lot of time
- Not a lot
- Never
- I don't know

How much do you like this friend?

- A lot
- A little
- I don't know
How long have you known this friend?

- A long time
- A short time
- I don’t know

Is this person a friend with your other friends?

- Yes
- No
- I don’t know
Name the other friends this person is friends with.

Do you have more friends?

Yes

no

I don’t know
1. Friend's name

Is this friend a boy or a girl?
How old is your friend?

- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21

I don't know

What grade is your friend in?

- 9th
- 10th
- 11th
- 12th
- Other

I don't know
How do you know this friend?

School  Neighborhood
Sports or activities  something different

How often do you see this friend?

A lot of time  Not a lot  Never

I don't know
How much do you like this friend?

- A lot
- A little
- I don’t know

How long have you known this friend?

- A long time
- A short time
- I don’t know
Is this person a friend with your other friends?

Yes  no

I don't know

Name the other friends this person is friends with.

I don't know
Do you have more friends?

- Yes
- No
- I don't know
Is this friend a boy or a girl?

How old is your friend?

14  15  16  17
18  19  20  21

I don't know
What grade is your friend in?

9th  10th  11th  12th

Other

I don't know

How do you know this friend?

School

Siblings or activities

something different

I don't know
How often do you see this friend?

- A lot of the time
- Not a lot
- Never
- I don't know

How much do you like this friend?

- A lot
- A little
- I don't know
Name the other friends this person is friends with.

Do you have more friends?

Yes

no

I don't know
1. Friend's name

Is this friend a boy or a girl?

I don't know
How old is your friend?
14 15 16 17
18 19 20 21
I don’t know

What grade is your friend in?
9th 10th 11th 12th
Other
I don’t know
How do you know this friend?

- School
- Neighborhood
- Sports or activities
- Something different
- Don't know

How often do you see this friend?

- A lot of time
- Not a lot
- Never
- Don't know
How much do you like this friend?

A lot
A little
I don't know

How long have you known this friend?

A long time
A short time
I don't know
Part 4: My Activities

How often do you TALK ON THE PHONE with your friends?

A lot  sometimes  A little

I don’t know
How often do you EMAIL your friends?

- A lot
- Sometimes
- A little

I don't know

How often do you TEXT your friends?

- A lot
- Sometimes
- A little

I don't know
1. How many friends do you hang out with at HOME or a FRIEND’S HOUSE?

2. How often do you hang out with friends at HOME or a FRIEND’S HOUSE?

   A lot     Sometimes     A little

I don’t know