

# Social Networks and the Education of Children and Youth

**B Schneider and T G Ford**, Michigan State University, East Lansing, MI, USA  
**L Perez-Felkner**, University of Chicago, Chicago, IL, USA

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## Glossary

**Centrality** – Refers to the number of ties one has to others in a network. Those with more ties may have more access to resources contained within the network.

**Closure** – Refers to the interconnections members have with one another, that is, the social ties among the network members that are historical and bridging.

**Density** – Refers to the number and strength of ties among individuals within a social network. In formal network theory, density refers to the number of ties observed divided by the number of total possible ties in a bounded group.

**Homogeneity** – Being in a group with similar demographic and other characteristics.

**Homophily** – The concept that friendships tend to form among people who perceive themselves as similar to one another.

**Proximity** – A basis of interpersonal attraction characterized by physical or psychological proximity to another.

**Social networks** – The social ties among a group of individuals, which can involve as small as two “also known as a dyad” or much larger numbers of individuals.

The social networks of children and youth are formed in the context of their families, peer groups, schools, and neighborhood communities. Researchers studying social networks of children and adolescents have primarily been interested in the formation of friendship relations and the impact of social location on academic achievement and social development. Social networks are commonly defined as the social ties among a group of individuals, which can involve as small as two – also known as a dyad – or much larger numbers of individuals. Through these social ties, social norms can form which constitute social capital, the resources within social groups that increase the potential for members to achieve their interests and goals (Coleman, 1990). Scholars have identified several characteristics of social capital that have direct implications for the formation and function of social networks. These properties include density, closure, and trustworthiness (Coleman, 1988).

Density generally refers to the number and strength of ties among individuals within a social network. In formal network theory, density refers to the number of ties observed divided by the number of total possible ties in a bounded group. The degree to which multiple network members share reciprocal ties with one another determines the cohesiveness of the network (Wasserman and Faust, 1994). Dense social networks can have positive or negative influences on their members depending on the social context of the network and its goals. In children's social networks where academic performance is valued and children have strong relationships with each other, these values are likely to be transmitted and upheld by the network. However, in situations where networks are dense and the goals are negative, such dense ties can encourage negative behavior patterns. For example, Haynie (2001), examining friendship networks using Add Health data, finds a general association with an adolescent's delinquency and that of his or her friends. Results indicate that network density appears to be a critical component of the delinquency–peer association.

Closure refers to the interconnections members have with one another, that is, the social ties among the network members that are historical and bridging in multiple contexts. In formal network theory, closure refers to how all of an ego's alters (e.g., a student's teacher, parent, and sibling) communicate, thereby closing the circle. Coleman (1990) argues that intergenerational social closure, the reciprocal social ties that connect children with their families, help to create functional communities where educational goals are strengthened and acted upon. Parent social networks that include the parents of their children's friends can build social capital that is reinforced through their children's peer networks, their own adult networks, and the intergenerational family and community networks that the parents and their children share. This point is illustrated by Offer and Schneider (2007), who show in their analysis of data from a study of parents and children in 500 families that adolescents' friendships with peers generate friendships among the parents of their friends, suggesting that information and social resources flow from children to adults as well as from adults to children.

Bridging social networks can be especially beneficial for members in low-resource networks. Distinguishing between weak and strong social ties, Granovetter (1973) finds in his study of job searches how individuals in

low-resource networks learn about employment opportunities through weak ties outside their immediate social circle. A similar argument has been made by [Kim and Schneider \(2005\)](#) with respect to schools, where they show how immigrant parents who broker and maintain ties to individuals outside their school communities gain access to more resources for their children's education.

Dense social networks with high degrees of closure promote trustworthiness ([Coleman, 1988](#)). This concept of trust has been further developed by [Bryk and Schneider \(2002\)](#) in their study of the effectiveness of urban school reform in Chicago elementary schools, where they show that relational trust which is formed through shared expectations and fulfillment of mutual obligations increases the likelihood of school change and higher academic performance. When relational trust is strengthened in social networks among various role sets, including teachers and parents, teachers and students, and parents and administrators, and the academic and social welfare of the students becomes the top priority, such relationships create a more productive learning environment for the entire school community.

### **The Study of Social Networks**

The social networks perspective distinguishes itself from other research approaches through its emphasis on the importance of the relationships between units in a study. In contrast to many non-network research studies, studies of social networks begin with the assumption that individuals and their actions are interdependent, that is, the behaviors and/or actions of one individual influence the behaviors and/or actions of others within a group. Social network analysis also understands the relational ties which exist between individuals within a network to be pathways, which enable the flow of resources among members. From the perspective of individuals within a group, network analyses also endeavor to ascertain how network structure facilitates or constrains individual action in a network ([Wasserman and Faust, 1994](#)).

The study of social networks could be understood as focused on two distinct methodologies: (1) formal network analysis and (2) observational network analysis. Formal network methodology employs mathematical models to describe the relationships within a specific, bounded population. To obtain this information, researchers first identify all members of the population of interest and then ask each subject to report on his/her relations with every other member of the group. In this instance, researchers try to obtain information from all members of a fully enumerated social group, which is often called complete network data ([Marsden, 1990](#)).

The methods of describing network structure are being modified and tested; now researchers can examine small

and large networks, with ten to hundreds of thousands of nodes sites of network connections ([Moody, 2001a](#); [Wasserman and Faust, 1994](#)). Technological advances over the past 50 years have enhanced the development of these models from those that were static to ones that are more fluid. New techniques, such as dynamic network visualization, capture motion and change within networks, allowing researchers to study how networks develop and change through static flip books and/or dynamic movies ([Moody et al., 2005](#)). These new methods are designed to visualize relational change beyond more conventional techniques that use one- or two-dimensional pictures with points, lines, and arrows showing directionality.

Egocentric network studies also use formal methodology to focus on how networks operate around individuals. In these studies, subjects typically report affiliations and ties through surveys or structured interviews. Although these data tend to be less comprehensive than that of the complete network in which they are embedded, they are generally useful in studies where the research question concerns how individuals and small groups evaluate their position and affiliations (e.g., centrality – one who has ties to most network members; popularity – more friendship nominations than one would expect based on network composition) in relation to others in the network. Studies of this type generally generate data through peer nominations where subjects are asked to name their three closest friends. These questions have been asked in the major national longitudinal studies conducted by the National Center of Education Statistics (NCES) over the past 40 years beginning with *High School and Beyond*, followed by the *National Educational Longitudinal Study of 1988 (NELS: 88)*, and, more recently, in the *Educational Longitudinal Survey of 2002 (ELS: 2002)*.

Observation field-based studies provide extensive descriptive information on how members of a group interact with one another in multiple situations, often over time. One of the most recent examples of this type of study was conducted by [McFarland \(2001\)](#) where he used student and teacher surveys, interviews, and school records to examine how social networks contribute to active resistance in 36 classrooms in two Midwestern high schools. Measuring individual and clique-level status, density, and academic standing, McFarland comprehensively describes the characteristics and processes by which student networks create opportunities for student resistance to instructional activities, showing that resistance is related to the structure of student relations and not simply a result of individual responses to teachers' instruction.

### **Social Networks and Young Children**

Friendships among children are generally understood to be significant in determining future developmental outcomes.

The friendships that children form with one another are resources that they can draw upon to cope with the psychological and social stresses of developmental transitions, such as that from childhood to adolescence. In understanding how development is impacted by childhood friendships, Hartup (1996) maintains that it is not enough to know that a child has friends; we should also know something about the identities – including attitudes and behavioral characteristics – of that child's friends, as well as the nature of their relationship. In other words, more comprehensive assessments of children's friendships are needed in order to bring more predictive power to bear on anticipating a child's future disposition and social competence.

Given the salience of friendship networks in the study of child development, it is not surprising that many studies of social networks among children have focused on the formation of peer groups. One of the most frequently cited studies was conducted by Hallinan and Tuma (1978), where they examined the friendship networks of fourth, fifth, and sixth graders over time. Asking children to name their best friends, friends, and nonfriends over time, the researchers measured friendship stability formed through personal relationships and those that were formed through learning-related tasks directed by the teacher. Contrary to expectations, they found that within-classroom student network groupings that were determined by the children's choices, best nominated friends did not emerge as more stable than those friendships that developed through teacher-assigned groups. Their findings suggest that teacher grouping based on classroom tasks strongly affected children's friendship formations.

More recent studies of social networks have also pursued the influence of teacher instructional practices on children's friendship choices. Plank (2000) examined how teachers' task and reward structures influence the academic and social hierarchy in the social networks of Hmong and white students in ten classrooms in five Midwestern elementary schools. Focusing on the effects of social hierarchy on racial and ethnic integration, he found that students from higher social classes tended to be at the center of classroom social networks. Plank suggests that norm-based task and reward structures seem to produce social groups that align across class and racial lines, concluding that the pedagogical style of the teacher directly influences the social network structure of children in the classroom.

Another study by Kubitschek and Hallinan (1998) also focused on teacher activities and friendship patterns. Using social network data, they establish a link between teacher-tracking practices and student friendship choices, demonstrating that these linkages cohere around three bases of interpersonal attraction: propinquity, similarity, and status. They argue that the nature and effects of tracking practices determine friendship choices due to their propensity to encourage intra-track communication

(propinquity), to create greater similarity among students within tracks (similarity), as well as to reflect stratification trends in greater society (status).

Cairns *et al.* (1995) sought to examine the relative stability of friendships and social networks in childhood and adolescence among 131 fourth- and seventh-grade students in two suburban schools over a 3-week period. The researchers used respondent interviews administered at the beginning and end of the observational period to determine social group membership through the social-cognitive map (SCM) procedure. For both children and early adolescents in this study, Cairns *et al.* demonstrate that friendships and social group membership are generally more fluid than has previously been recognized. This fluidity of friendship ties has also been found in adolescent peer and friendship ties, with youth repositioning their social ties throughout the high school experience (Steinberg *et al.*, 1996). However, friendships developed through school-sponsored activities appear to be more stable (Schneider and Stevenson, 1999).

## Social Networks and Adolescents

Just as peer interactions play an important role in the development of young children, so also are peer groups influential in adolescent identity development. Adolescence marks the time when young people seek to establish an independent identity from their families and seek acceptance and a sense of belonging through peer groups. As this occurs, similar shifts in the locus of peer relations occur, from dyadic or small-group relationships to peer groups or crowds (Brown and Lohr, 1987). The importance of crowd affiliation on identity development was studied early on by Brown *et al.* (1986). Based on subjective responses of adolescents regarding the importance of crowd affiliation and why it was important, the researchers found that importance of crowd affiliation was negatively associated with age. Thus, younger adolescents tended to value crowd associations, while older adolescents relied on them less heavily, due to the strength of established friendship networks. Furthermore, respondents' sense of identity was not related to the importance they placed on crowd affiliation, but was related to the centrality of their position in the peer network.

Crowd affiliations have also been demonstrated to predict future behaviors, educational attainment, and general psychological adjustment in adolescents. Using widely recognized identity categories such as the jocks, brains, and the princesses, Barber *et al.* (2001) found that jocks and brains had the most positive adjustment in later years, primarily due to their involvement in school-related activities in tenth grade. Future adolescent adjustment was also found by Fuligni *et al.* (2001) to be related to adolescent peer

dependence. The more adolescents reported being willing to sacrifice their talents and school performance for being in a particular group, the poorer was their academic performance and overall adjustment. Taken together, these findings suggest that peer-group orientation plays an influential role in adolescent's identity development.

Due to its relationship to peer groups, identity development in adolescence has been a topic of particular interest to social network researchers. Collecting data on nearly 6000 high school students in California, [McFarland and Pals \(2005\)](#) explore how social networks affect the identity development of adolescents. They found that, while category memberships are highly influential in identity development, the network characteristics of prominence, homogeneity, and bridging lead to higher salience of identity imbalance, which in turn leads to an increased incidence of identity change. Homogeneity, that is, being in a group with similar demographic and other characteristics, exerted the greatest influence on identity change, revealing that, over time, social conformity inhibits identity instability and inconsistency.

The concept that friendships tend to form among people who perceive themselves as similar to one another is termed homophily. These social affiliations tend to be aligned around traits on which people share values (value homophily) or social status (status homophily). [McPherson et al. \(2001\)](#), in their review of homophily, argue that the most persistent traits which determine network homogeneity are race and race-like ethnicity.

The tendency toward network homophily and homogeneity is evidenced in several studies. [Jackson et al. \(2006\)](#), in their study of 1268 fifth graders' peer and teacher nominations of classroom social network relationships, asked students to rate who is most like them (Like Most), most not like them (Like Least), a leader (Leader), and who is aggressive (Fights). They found that classroom racial composition and the race of the teacher are directly related to the nominations of students into each of these groups. In classes that are majority white, black students are significantly less likely to be nominated by both peers and teachers as a leader, more likely to be categorized as aggressive, and less likely to be nominated in friendship networks. However, they also demonstrate that, as black students are increasingly represented in the classroom, black children's nominations to these categories also improve. Based on these findings, the researchers conclude that white children tend to be more protected in majority black environments – a phenomenon they attribute to their status in the broader social community and to the history of discrimination and bias against blacks.

Examining the substantive integration of friendship networks in varied school contexts, [Moody \(2001b\)](#), using data from the Add Health Study, draws on contact theory to explore the relationship between friendship segregation and school organization and diversity. His findings suggest

a curvilinear relationship between heterogeneity and friendship segregation, finding that once a particular threshold of race salience is reached in the school, integration peaks and then falls. Moody maintains that schools have the greatest effect on racial friendships when they can structure racial mixing through the racial integration of extracurricular activities.

Virtual networks have emerged as sites for establishing socialities, although early studies suggested that ties created through the Internet were weak. Today, adolescents and young adults frequent sites such as MySpace, Facebook, and online dating websites to form new relationships. The relationships formed within these groups may or may not exist additionally outside of virtual space, but they are nonetheless real, to varying degrees. Youth participate in these networks for generally similar purposes as their traditional social groups: to forge new social relationships, find and interact with people who share their interests, and find people to date. Online relationships are now considered a part of the social world of most adolescents. These relationships are becoming increasingly significant to research on social networks not only because they are more prevalent, but also because they refine and reshape understanding of the motivations underlying adolescent friendship formation as well as the possible avenues in which those relationships can be forged. In other words, adolescents who may have traditionally been understood as social isolates, due to their difficulties forming interpersonal relationships with face-to-face friends, now have other outlets for forming relationships which need to be brought to bear for understandings of peer networks in schools.

Previous research into adolescent friendship formation has primarily been analyzed through social needs and social compensation perspectives. The social needs perspective attributes the motivations behind adolescent development to personal needs for intimacy, self-validation, and companionship, whereas the social compensation perspective focuses more on the relationships that adolescents have with their parents to understand motivations behind friendship formation. Research supporting the social compensation approach is exemplified in the findings of [Mesch and Talmud \(2006\)](#). In a survey of a nationally representative sample of adolescent households in Israel (1000 in total), this study examined differences between adolescents who formed online friendships from those who did not, as well as adolescents' perceived strength of social ties in terms of the nature of initial contact (either online or face-to-face). The study found that adolescents reporting conflicts with parents turned to online friendships rather than face-to-face relationships, in part due to the anonymity of online communication. Further, this study's findings challenge previous research of the strength of social ties in online relationships, asserting that it is not technology which affects friendship formation, but rather the social embeddedness of the ties.



## Social Networks, Educational Expectations, and Academic Performance

Social networks in schools have been demonstrated to significantly affect students' academic performance. Friendship ties with academically oriented peers have been found to produce academic advantages, particularly for youth in low-performing schools, suggesting that youth in a social environment with lower resources can be protected by the social capital generated in their academically oriented peer relationships (Crosnoe *et al.*, 2003). Further, in a study of friendship networks among 929 fifth-through seventh-grade children, Altermatt and Pomerantz (2005) found that respondents' grades were highly predicted by their friends' report card grades for that academic year – a positive educational achievement effect of their social networks. Nesting their findings within social comparison theory, the authors conclude that friendships with high-achieving peers benefit both high achievers and low achievers. They find moderate evidence however that low achievers' self-esteem decreases as result of friendships with peers who outperform them academically.

In several studies, hierarchy and clique development among students within classrooms have been linked to homogeneity of academic achievement and academic track placement. In a longitudinal study of 1477 pre-adolescents from fourth through seventh grade, Hallinan and Smith (1989) found that classrooms with low degrees of academic variance – especially with regard to high-ability students – also tend to have a low incidence of social clique formation. This finding suggests that academic tracking may have negative consequences for student social development, especially among gifted students. However, in classrooms with mixed-ability students in which the teacher stressed the importance of high academic achievement, the researchers found that cliques tended to form around homogeneity of achievement. This particular finding suggests that teachers – especially those with mixed-ability classes – should be mindful of how they organize their classroom with regard to maximizing academic achievement for all students.

Fuligni *et al.* (1995) maintain that the selection of adolescents into academic tracks should be seen as an important environmental change with impacts on their developmental transition from childhood to adulthood. Measuring adolescent's math grouping status over time in sixth, seventh, and tenth grade, they find that middle- and upper-level students benefit in both their math-related self-concept and academic performance; for low-ability-level students however, their self-concept initially increases, but decreases by tenth grade. Thus, low-ability grouped peers emerge with lower self-concepts than their nontracked peers.

Examples of studies which combine academic data with social network data serve as significant contributions to the study of how networks affect academic outcomes in

children and youth. Supplementing academic information in the Add Health study, the Academic Achievement supplement to Add Health (AHAA) facilitates the measurement of the effect of social networks on academic achievement, controlling for different family, school, and classroom contexts. Early research using this data has found strong relationships between peer networks and advanced mathematics course taking, a factor that weighs considerably in youth's academic careers (McFarland, 2006). A similar study using this data set also shows that female friendships boost advanced mathematics course taking and counter the traditional drop-off in female adolescent participation in advanced math and sciences (Riegle-Crumb *et al.*, 2006).

Social networks need not involve students to promote student performance. Morgan and Sørensen (1999) argue that intergenerational social closure – in this case, dense network connections between the parents of students – has both the potential for negative as well as positive effects on academic achievement, depending on the resources available within the community. They suggest that horizon-expanding schools and organizations shift the roles of monitoring norms and disseminating expectations away from the network actors and toward professionals and others outside of the primary network. Using parent and student-level data from the National Educational Longitudinal Study of 1988, the authors compare math test score gains in horizon-expanding schools and norm-enforcing schools, finding that horizon-expanding network configurations produce greater academic benefits than do norm-enforcing schools in the public school context.

Furthermore, social trust generated within school institutions has been found to generate greater efficiency and effectiveness in educational interventions, with teachers as members activating capital transferred from administrators, reform experts, and/or other peers. Similar to the concept of functional specificity, Frank *et al.* (2004) find that taxing or diffusing social capital reduces its effectiveness. In other words, the less pressures administrators place on their teachers at one time, the more efficiently they are able to tap available resources in the service of implementing educational innovations of benefit to their students.

## Social Networks, Deviant Behaviors, and Health

The influence of peer groups on children and youth's development yields both positive and negative outcomes. Peer networks have been demonstrated to promote prosocial behaviors, such as extracurricular participation and leadership (Brown, 1990; Elder, Jr. and Conger, 2000). However, peer groups can also contribute to negative outcomes for youth, such as increased participation in

antisocial behaviors, often to the detriment of their educational futures. Studies examining the operation of delinquent behavior among adolescent peer groups have found significant network effects – in particular, characteristic differences between antisocial and prosocial peer networks (Giordano *et al.*, 1986). In a study of how the peer networks of aggressive children function to promote bullying and other deviant behaviors, Cairns *et al.* (1988) examined the role of aggressive children within their social networks in school, investigating how network structure relates to antisocial behavior. Using cluster analyses and best-friend nominations, they find that aggressive youth do not differ from control subjects in the degree of social cluster membership – in fact, many are often solid, central members of peer groups. These findings demonstrate that aggressive youth are not more likely than other students to become social isolates, and do have networks of peer support, despite being disliked for their behavior.

The development of increasingly sophisticated sociometric data has enabled researchers to examine the etiology of peer socialization into behavior norms, such as the process by which socially isolated youth are initialized into gangs and commit crimes against property. In analyzing these particular delinquent behaviors, Kreager (2004), using Add Health data to identify social isolates, found that isolation alone does not predict future delinquency, which replicates the findings of previous studies (see Haynie, 2001). However, when isolation is combined with peer conflict, or otherwise negative peer encounters, significant increases in delinquency and delinquent peer associations were measured.

In a related study, van Lier *et al.* (2005) support the significance of peer rejection as a predictor of deviance in their study of antisocial behavior among French-Canadian and Dutch boys and girls. Using peer nominations to classify antisocial behavior developmentally from childhood to early adolescence, the researchers employ a network analysis and find that peer rejection most greatly correlates with antisocial behavior and occurs more readily in youth involved in high-delinquency behavior patterns. This suggests that the process by which homophily occurs is a consequence of pre-existing preferences rather than a result of the socializing norms of the peer group.

Additionally, health-related behaviors of youth have been closely linked to social network affiliations. Early substance use has been tied to social networks, in particular, adolescent drug use (Kandel, 1978), drinking (Stattin *et al.*, 1989), and cigarette smoking (Alexander *et al.*, 2001). Moreover, early and risky sexual behavior has been linked with peer-group membership (Bearman *et al.*, 2004). Advances in social network theory and design offer increasingly rigorous and nuanced evidence of how children's behavior and educational futures are affected by the social networks in which they are embedded.

See also: Children's Friendship; Early Social Development and Schooling; Peer Interaction and Learning; Peer Learning in the Classroom; Peer Relations and Socialization of Children and Adolescents with Special Needs; Perspectives on Schooling in the Middle Years; Social Capital, Educational Institutions and Leadership; Social Development and Schooling.

## Bibliography

- Alexander, C., Piazza, M., Mekos, D., and Valente, T. (2001). Peers, schools, and adolescent cigarette smoking. *Journal of Adolescent Health* **29**(1), 22–30.
- Altermatt, E. R. and Pomerantz, E. M. (2005). The implications of having high-achieving versus low-achieving friends: A longitudinal analysis. *Social Development* **14**(1), 61–81.
- Barber, B. L., Eccles, J. S., and Stone, M. R. (2001). Whatever happened to the jock, the brain, and the princess? Young adult pathways linked to adolescent activity involvement and social identity. *Journal of Adolescent Research* **16**, 429–455.
- Bearman, P., Moody, J., and Stovel, K. (2004). Chains of affection: The structure of adolescent romantic and sexual networks. *American Journal of Sociology* **110**, 44–91.
- Brown, B. B. (1990). Peer groups and peer culture. In Feldman, S. S. and Elliott, G. R. (eds.) *At the Threshold: The Developing Adolescent*, pp 171–196. Cambridge, MA: Harvard University Press.
- Brown, B. B., Eicher, S. A., and Petrie, S. (1986). The importance of peer group (“crowd”) affiliation in adolescence. *Journal of Adolescence* **9**, 73–96.
- Brown, B. B. and Lohr, M. J. (1987). Peer group affiliation and adolescent self-esteem: An integration of ego identity and symbolic interaction theories. *Journal of Personality and Social Psychology* **52**, 47–55.
- Bryk, A. S. and Schneider, B. (2002). *Trust in Schools: A Core Resource for Improvement*. New York: Russell Sage Foundation.
- Cairns, R. B., Cairns, B. D., Neckerman, H. J., Gest, S. D., and Gariépy, J. (1988). Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology* **24**, 815–823.
- Cairns, R. B., Leung, M. C., Buchanan, L., and Cairns, B. D. (1995). Friendships and social networks in childhood and adolescence: Fluidity, reliability, and interrelations. *Child Development* **66**, 1330–1345.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology* **94**(S), S95–S120.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge: Belknap Press of Harvard University Press.
- Crosnoe, R., Cavanagh, S., and Elder, G. H. Jr. (2003). Adolescent friendships as academic resources: The intersection of friendship, race, and school disadvantage. *Sociological Perspectives* **46**(3), 331–352.
- Elder, G. H. Jr. and Conger, R. D. (2000). *Children of the Land: Adversity and Success in Rural America*. Chicago, IL: University of Chicago Press.
- Frank, K. A., Zhao, Y., and Borman, K. (2004). Social capital and the diffusion of innovations within organizations: The case of computer technology in schools. *Sociology of Education* **77**(2), 148–171.
- Fulgini, A. J., Eccles, J. S., and Barber, B. L. (1995). The long-term effects of seventh-grade ability grouping in mathematics. *Journal of Early Adolescence* **15**(1), 58–89.
- Fulgini, A. J., Eccles, J. S., Barber, B. L., and Clements, P. (2001). Early adolescent peer orientation and adjustment during high school. *Developmental Psychology* **37**, 28–36.
- Giordano, P. C., Cernkovich, S. A., and Pugh, M. D. (1986). Friendships and delinquency. *American Journal of Sociology* **91**, 1170–1202.
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology* **78**, 1360–1380.
- Hallinan, M. T. and Smith, S. S. (1989). Classroom characteristics and student friendship cliques. *Social Forces* **67**, 898–919.

- Hallinan, M. T. and Tuma, N. B. (1978). Classroom effects on change in children's friendships. *Sociology of Education* **51**(4), 270–282.
- Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development* **67**(1), 1–13.
- Haynie, D. L. (2001). Delinquent peers revisited: Does network structure matter? *American Journal of Sociology* **106**(4), 1013–1057.
- Jackson, M. F., Barth, J. M., Powell, N., and Lochman, J. E. (2006). Classroom contextual effects of race on children's peer nominations. *Child Development* **77**, 1325–1337.
- Kandel, D. B. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology* **84**(2), 427–436.
- Kim, D. H. and Schneider, B. (2005). Social capital in action: Alignment of parental support in adolescents' transition to post-secondary education. *Social Forces* **84**(2), 1181–1206.
- Kreager, D. A. (2004). Strangers in the halls: Isolation and delinquency in school networks. *Social Forces* **83**(1), 351–390.
- Kubitschek, W. N. and Hallinan, M. T. (1998). Tracking and students' friendships. *Social Psychology Quarterly* **61**(1), 1–15.
- Marsden, P. V. (1990). Network data and measurement. *Annual Review of Sociology* **16**, 435–463.
- McFarland, D. A. (2001). Student resistance: How the formal and informal organization of classrooms facilitate everyday forms of student defiance. *American Journal of Sociology* **107**(3), 612–678.
- McFarland, D. A. (2006). Curricular flows: Trajectories, turning points, and assignment criteria in high school math careers. *Sociology of Education* **79**(3), 177–205.
- McFarland, D. A. and Pals, H. (2005). Motives and contexts of identity change: A case for network effects. *Social Psychology Quarterly* **68**(4), 289–315.
- McPherson, J. M., Smith-Lovin, L., and Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology* **27**, 415–444.
- Mesch, G. S. and Talmud, I. (2006). Online friendship formation, communication channels, and social closeness. *International Journal of Internet Science* **1**, 29–44.
- Moody, J. (2001a). Peer influence groups: Identifying dense clusters in large networks. *Social Networks* **23**, 261–283.
- Moody, J. (2001b). Race, school integration, and friendship segregation in America. *American Journal of Sociology* **107**, 679–716.
- Moody, J., McFarland, D. A., and Bender-deMoll, S. (2005). Dynamic network visualization. *American Journal of Sociology* **110**, 1206–1241.
- Morgan, S. L. and Sørensen, A. (1999). Parental networks, social closure, and mathematics learning: A test of Coleman's social capital explanation of school effects. *American Sociological Review* **64**(5), 661–681.
- Offer, S. and Schneider, B. (2007). Children's role in generating social capital. *Social Forces* **85**(3), 1–18.
- Plank, S. (2000). *Finding One's Place: Teaching Styles and Peer Relations in Diverse Classrooms*. New York: Teachers College Press.
- Riegler-Crumb, C., Farkas, G., and Muller, C. (2006). The role of gender and friendship in advanced course taking. *Sociology of Education* **79**(3), 206–228.
- Schneider, B. and Stevenson, D. (1999). *The Ambitious Generation: America's Teenagers, Motivated but Directionless*. New Haven, CT: Yale University Press.
- Stattin, H., Gustafson, S. B., and Magnusson, D. (1989). Peer influences on adolescent drinking: A social transition perspective. *Journal of Early Adolescence* **9**, 227–246.
- Steinberg, L., Brown, B. B., and Dornbusch, S. M. (1996). *Beyond the Classroom: Why School Reform Has Failed and What Parents Need to Do*. New York: Simon and Schuster.
- van Lier, P. A., Vitaro, F., Wanner, B., Vuijk, P., and Crijnen, A. A. (2005). Gender differences in developmental links among antisocial behavior, friends' antisocial behavior, and peer rejection in childhood: Results from two cultures. *Child Development* **76**(4), 841–855.
- Wasserman, S. and Faust, K. (1994). *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press.

## Further Reading

- Burt, R. (1992). *Structural Holes*. Cambridge: Harvard University Press.
- Coleman, J. S. (1961). *The Adolescent Society. The Social Life of the Teenager and Its Impact on Education*. New York: Glencoe Free Press.
- Epstein, J. L. and Karweit, N. (eds.) (1983). *Friends in School: Patterns of Selection and Influence in Secondary Schools*. San Diego, CA: Academic Press.
- Friedkin, N. E. and Thomas, S. L. (1997). Social positions in schooling. *Sociology of Education* **70**, 239–255.
- Hallinan, M. T. (1980). Patterns of cliquing among youth. In Foot, H., Chapman, T., and Smith, J. (eds.) *Friendship and Childhood Relationships*, pp 321–342. New York: Wiley.
- Hallinan, M. T. and Sørensen, A. (1985). Ability grouping and student friendships. *American Educational Research Journal* **22**(4), 485–499.