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The methodological and theoretical advances in this volume provide new perspectives on longstanding questions about the extent to which both complementarity and reciprocity underlie social relationships. These chapters highlight innovative approaches for clarifying the role of contextual and developmental variations in social structures and processes that are at the core of developmental social network science.

Studying the Individual Within the Peer Context: Are We on Target?

Thomas W. Farmer

> The emphasis of modern educational theory on the socioemotional aspects of human growth has imposed the necessity of developing techniques for evaluating the degree and character of social development. The problem has been complicated by the fact that social development applies not only to the individual but also to the social organization of which he is a part. Variations occur not only in the social status of a particular person within the group, but also in the structure of the group itself—that is, in the frequency, strength, pattern, and basis of the interrelationships which bind the group together and give it distinctive character.
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> Urie Bronfenbrenner, 1943

A decade ago, I had the pleasure of spending an afternoon with Dr. Bronfenbrenner and showing him the methods and findings of the research we were conducting on social networks at the Center for Developmental Science. After listening carefully and asking several questions, he commented that our research was important because we were trying to understand the individual within the context of the classroom ecology. But he went on to say that although he was encouraged by our efforts, he was also disappointed

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because it appeared that the field had not moved very far since his doctoral work in the 1940s. He pointed out that our focus of examining children's social position in distinct peer groups and the position of each group within the hierarchy of all groups in the classroom social structure was not far from the bull's-eye target procedure he had used to study social status in his dissertation.

Dr. Bronfenbrenner went on to elucidate three concerns in social network research that reflect the quote that opens this chapter. First, because social contexts are not simply a product of organizational factors, but reflect characteristics of the individuals of which they are composed, it is tricky business to infer social positions across contexts because the mix of individuals can impact the structural components of groups and the resultant social roles of the children that make up the peer ecology. Second, because the development of children and groups are both dynamic, it is necessary to establish measures and analytic procedures that can capture dynamic change in each in relation to the other. Third, a comprehensive analysis of social development requires not only understanding change in individuals and contexts in relation to each other but also demands the measured investigation of the processes and mechanisms that link each to the other and that promote the dynamic interchanges that guide ontogeny.

In the years following this conversation, I have attempted to keep an eye toward addressing these issues in my own research, but this has been an elusive goal. Thus, as I read the chapters in this volume, I viewed them from the lens of Dr. Bronfenbrenner's comments. Although no one chapter addresses all three concerns outlined above, collectively there is considerable promise in these chapters. On this score, I provide a brief overview of these studies and emphasize their methodological and conceptual contributions. I conclude with a discussion of how this work may help address areas that have not been adequately explored with prior methodologies and theoretical frameworks.

Overview

This is an eclectic group of chapters that use vastly different methodologies, focus on distinct content areas, and examine diverse conceptual issues. Yet, the five studies presented here share a common center as each is aimed at elucidating structural features of social networks and their contributions to development.

Hanish and colleagues (this volume) present the Q-connectivity method as an approach for using observations of peer play interactions to identify social networks of preschoolers. One strength of this methodology is that it uses the individual as the unit of analysis and yields information on the social networks of each child. From this vantage, the data indicate that there are considerable individual differences in the degree to which children interact with the same group, and it appears that many preschoolers become engaged with multiple networks. This suggests that not only

must we be careful about conceptualizing social networks as global classroom structures but also consider them as being individually constructed and, in some ways, unique to each member of the broader social unit.

In a similar vein, Espelage and colleagues (this volume) use p* analysis to examine social network structures by starting with and building out from the individual. With this approach, lower-level friendship ties (the dyad and triad) are used to specify more complex network structures. As the authors suggest, these procedures enhance the ability to investigate mechanisms of peer influence and the evolution of peer groups. At a conceptual level, this work indicates that children's social ties reflect a complexity of relations within a network and suggest that peer group effects build from these lower-order relationships. Therefore, investigations of peer influence should not only center on the totality of the group but also consider the focal child's specific ties within the group.

Gest and colleagues (this volume) examined gender differences in group cohesion and status hierarchies in fifth and seventh grades. Social Cognitive Mapping Procedures and principal component analysis were used to identify social networks, and friendship and "liked most" nominations were used to examine *density, reciprocity, distinctiveness,* and *status hierarchy*. Beyond showing that there were many similarities between boys' and girls' groups, this research demonstrated that friendship and liking nominations were much more likely to fall within rather than between groups. Conceptually, this suggests that although friendships and social acceptance are distinct from the peer group, they are highly centralized to the group. Further analyses of the linkages among these variables may help clarify social processes and roles within peer groups.

Rodkin and colleagues (this volume) explore the social integration of African American and European American children in relation to the racial and ethnic composition of the classroom. By using a social segregation index, these researchers examined tendencies toward segregation in relation to whether classrooms were composed primarily of black students, white students, or were racially diverse with no clear majority. In addition to demonstrating differential levels of segregation in relation to classroom composition, an analysis of liked-least nominations indicated a complex relationship between cross-race antipathies and whether classrooms were majority black or white. High levels of segregation among black students in majority white classrooms were accompanied by high cross-race antipathies among white students. Beyond the important contributions to understanding ethnic and racial relations in school, the conceptual framework and analytical approaches used in this study may have broader application for investigating patterns of homophily and intergroup relations in classrooms.

Light and Dishion (this volume) used the SIENA model of social network analysis to examine the confluence model of antisocial behavior. According to this model, antisocial behavior predicts social marginalization,

marginalized (rejected) youth tend to affiliate disproportionately with each other, and changes in antisocial behavior are proportional to the level of antisocial behavior of one's direct peers. These researchers conducted analyses at the school level and demonstrated that although components of this model were evident in each of the eight participating schools, the overall results were quite mixed. Specifically, although there was strong support for the expectation that rejected (that is, unpopular) youth tend to associate with each other, antisocial behavior was not associated with peer rejection in 75 percent of the schools. In addition, the view that antisocial peers operate as a behavioral contagion was supported in only one school. The results of this study demonstrate the complexities of the peer relations of aggressive youth and the importance of exploring variability across schools. Conceptually, the findings reported here are consistent with the view that there may be diverse patterns of peer support for antisocial behavior in schools (see also Farmer, Estell, Bishop, O'Neal, & Cairns, 2003; Farmer, Leung, Pearl, Rodkin, Cadwallader, & Van Acker, 2002).

Looking Forward

The overview of the contributions of these chapters highlights the complexities of the methodologies that have been developed to examine ontogeny within the peer system. Although we have made tremendous progress in terms of assessing network structures while maintaining a focus on individual development, it seems there is much work ahead until we are able to fully elucidate processes and mechanisms that link individual adaptation to peer group structures and broader classroom and school social systems. I believe that some of the limitations in this area have grown from methodological and theoretical expediency.

In terms of methodological expediency, many of the measurement models currently used in the social development literature focus on survey data. This allows researchers to efficiently and economically gather extensive data on student, peer, and teacher perspectives of peer acceptance, peer networks, and individual students' social and behavioral characteristics. The payoff to this approach is that large samples and databases can be quickly prepared for analyses and dissemination. Although survey data can be used to infer some social factors and processes, such as cohesiveness, social network centrality, and selective affiliation, other constructs require more extensive measurement approaches. These may include sequential observations across extended periods of time, individual narrative accounts of key social events and incidents, and short-term longitudinal classroom level analyses of key constructs, such as social roles, peer groups, and social structures. Such endeavors are costly in terms of data collection, data preparation, and analyses. Furthermore, these efforts often take considerable time from initiation to publication.

Theoretical expediency is tied to methodological expediency. Some theories link well to parsimonious measurement and analytical approaches. For

example, sociometric status measures provide for easy collection and analysis of data that can be readily processed to assess peer acceptance. Within this context, abundant research has been conducted on peer acceptance, and this has yielded the comprehensive development and refinement of theories of peer rejection. Likewise, with relatively recent advances in social network research, there has been an increase in studies that examine similarity in peer affiliations. From this work, researchers have been able to examine and extend theories of homophily, selective affiliation, and socialization (for example, Ennett & Bauman, 1994; Espelage, Green, & Wasserman, this volume; Kindermann, 1993). Although work in these areas is important and has been quite fruitful, other promising theories that are less methodologically accessible have not been as thoroughly examined or developed. Fortunately, the methods and procedures described in this volume are well suited for investigating several areas that are methodologically and theoretically complex but warrant more attention. Three examples are briefly described below.

One area of research that may benefit from the methodological and conceptual advances presented here is the expansion of the study of *social synchrony* in interpersonal interchanges and relationships. The concept of social synchrony refers to a property of social interactions in which "one person's acts are coordinated with and supportive of the ongoing activity of another individual" (Cairns, 1979 p. 298). *Reciprocity* is a form of synchrony that refers to similarity in actions by two or more individuals. This concept serves as a theoretical foundation for studies pertaining to homophily and socialization. Yet, a second form of social synchrony—*complementarity*—may be equally important for understanding group formation and process. Complementarity refers to actions in which the roles of two or more individuals are different but each is necessary for the ongoing activity of the other (for example, leader and follower). Although peer groups tend to be composed of individuals who are in some ways similar, they often contain members who are diverse on key characteristics and who may serve different but complementary social roles within the peer group (Farmer, Xie, Cairns, & Hutchins, 2007). For example, recent studies suggest that subtypes of aggressive youth such as popular aggressive and unpopular aggressive do not associate with each other but associate with peers who are similar to them in terms of perceived popularity (Farmer et al., 2002, 2003). Further, some aggressive youth appear to gain support from a range of conventional peers (see Rodkin, Farmer, Pearl, & Van Acker, 2006). These findings speak to both the strengths and the limitations of the homophily framework and may help explain why antisocial youth had rejected status in only two of eight schools (Light & Dishion, this volume).

However, complementarity is a difficult construct to assess and requires the analyses of interaction patterns and the assessment of social roles and hierarchies within peer groups. The Q-connectivity method (Hanish et al., this volume), the p* methodologies for conducting microlevel analyses of network structures (Espelage et al., this volume), and the analyses of

network cohesiveness and status hierarchies (Gest et al., this volume) appear suitable for investigating key constructs associated with complementarity. By carefully bringing these methodologies together, it should be possible to generate new perspectives on how youth who are in some ways dissimilar come together to support each other and the broader peer group. In turn, such work should yield new conceptual views for examining continuity and fluidity in peer networks and classroom social structures.

A second area of research that can be enhanced by the work in these chapters involves variability in both classroom and school contexts. As a former special education teacher and current education professor, I have approached the study of social networks with the understanding that the mix of students in a classroom or school can strongly influence instructional engagement and classroom behavior. More recently, in conducting research in rural communities across the country, I have become aware of the tremendous variability in school configurations and contexts. However, much of the work on peer relations and social networks has assumed a "typical" classroom and school framework. As Rodkin et al. (this volume) demonstrate, peer groups processes systematically vary in relation to the composition of classrooms. Furthermore, as Light and Dishion (this volume) find, variability in social relations is evident at the school level. Together, these studies highlight the importance of developing measurement and analytic approaches that preserve information about the context. Although multilevel techniques can promote awareness of ecological influences, there is also a need to develop techniques that facilitate the retention of "yoked" information or, in Cairns' terminology, the pattern of correlated constraints, linking individuals, groups, and schools in our studies of social processes. In addition to demonstrating what can be learned by examining variability within and across social contexts, these studies underscore the utility of exploring contextual differences as "natural" experiments in the study of social processes.

A third underexplored but critical issue in the study of individuals within the peer context involves clarifying developmental and organizational contributions. Schools are often organized in ways that reflect commonly held views about youths' social capacities and needs. Accordingly, the social contexts in preschool, elementary, middle, and high school settings tend to be quite distinct and are often designed around adults' conceptions of what is developmentally appropriate for a specific age group. As a result, some of the perceived developmental differences in children's social relations and processes may reflect differences in the social environments that we create for them at particular ages.

Much of the research on social networks has been initiated at the late childhood or early adolescent period. At times there seems to be a collective assumption that peer groups and social networks are not developmentally relevant until the late elementary school years. On this count, Rubin, Bukowski, and Parker (1998) document that there is a general lack of research on peer groups and structures in the early and middle childhood

periods. However, with recent methodological advances, it is possible to identify network structures and peer group processes in the preschool and early elementary periods (for example, Hanish et al., this volume). Although it is too early for definitive judgments, it appears that some phenomena that have been viewed as being developmentally determined may, in fact, be linked to organizational and process factors. For example, Pellegrini et al. (2007) have shown that the network reshuffling and jockeying for social position found during the transition from elementary to middle school were also largely evident in the transition from preschool to elementary school. As new methods for analyzing social networks are further refined for use with younger populations, it is possible that new information will emerge to suggest revisions in current conceptualizations of the role of peer groups and hierarchical social structures in early childhood social development.

In conclusion, although the study of social networks and peer contexts has traditionally lingered behind research on individuals and friendships (see Cairns, Xie, & Leung, 1998), the chapters in this volume mark a significant shift in the field. The change is not simply one of interest and attention but rather, as the studies in this volume demonstrate, striking advances in social network research in terms of depth, sophistication, and scope. Although I cannot speak for Dr. Bronfenbrenner, Dr. Cairns, and others who have guided the study of peer group context, I expect they would be pleased not only by the work in this volume but also by the growing emphasis on social networks within the peer relations community. These are exciting times for conducting social network research, and I look forward to the new directions that the future holds.

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THOMAS W. FARMER is associate professor of educational and school psychology and special education at the Pennsylvania State University.