Article

Conceptualizing Academic Norms in Middle School: A Social Network Perspective

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Abstract

A wide body of research has documented the relationship between social norms and individual behaviors. There is growing evidence that academic behaviors in early adolescence—when most children begin middle school—may be subject to normative influence as well. However, the structure and composition of peer relationships within middle schools have yet to be fully incorporated into current conceptualizations of academic norms. A social network approach that considers the structure of students' friendship networks can be a useful framework for informing understanding of middle school academic norms. This article integrates research and theory on social norms and social networks to introduce a model to improve understanding of academic norms in middle schools. Implications for future research are discussed.

Keywords

social norms, social networks, middle schools, academic achievement

The power of social norms to influence behavior is one of the most long-standing findings in the social and behavioral sciences (Deutsch & Gerard, 1955; Sherif, 1936). Growing empirical work suggests social norms—or

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group consensus regarding the frequency or perceived acceptability of behaviors in a setting—contribute to a variety of early adolescents' behaviors in classrooms and schools (e.g., aggression, prosocial behaviors; Prinstein & Dodge, 2008). Recent studies provide preliminary evidence that positive academic behaviors (e.g., attendance, participation in class, completion of homework) may be subject to normative influence as well (Juvonen, Espinoza, & Knifsend, 2012). Given a wide and growing body of research identifying decreases in children's academic achievement as they transition to middle school, coupled with evidence that peer influence on children's academic outcomes increases during early adolescence (Juvonen & Cadigan, 2002; Seidman, Aber, & French, 2004), additional theoretical and empirical research examining academic norms in middle school is warranted.

Academic norms are defined as a more specific dimension of social norms, representing group consensus on the frequency and perceived acceptability of positive behavioral engagement in school (i.e., participation in school and efforts to perform academic tasks; Fredricks, Blumenfeld, & Paris, 2004; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008). The complex structure and composition of peer relationships in middle schools can inform the conceptualization of middle school academic norms. Indeed, social network theory suggests that normative behaviors are a direct product of students' social connections (Wellman, 1988). In this model, norms are derived from students' positions in the relational network and are developed and maintained through the broader structure of social relationships across the setting. In the current article, we integrate research on social networks and social norms, and argue that structural components of the middle school relational network—specifically students' individual network centrality, as well as network closure and density—are associated with academic norms. After linking norms and social networks, we then identify peer socialization processes and school-level factors that may predict the strength and valence of middle school academic norms. Finally, we discuss the use of this theoretical model as a foundation for empirical research examining students' academic norms in middle school settings. Both developmental and intervention research will benefit from a reconceptualization of middle school academic norms, measured at the level of the school setting and rooted in the salient relational ties extant between the students in the setting.

Norms in Early Adolescence

Although social norms have been studied in a number of ways, two types of norms—descriptive and injunctive—have dominated psychological research (Borsari & Carey, 2003). Work rooted in social psychology defines

descriptive norms as the degree of uniformity within a group or setting (e.g., peer group, classroom, school) for a certain behavior (Larimer, Turner, Mallett, & Geisner, 2004). For example, if most middle school students choose to wear backpacks to school, then the descriptive norm is to wear backpacks; the descriptive norm is measured as the aggregate level of backpack wearing across students in the school. In contrast, an injunctive norm describes the approval of a behavior held by the individuals in a group or setting (Cialdini, Reno, & Kallgren, 1990). Only if most middle school students approve of wearing backpacks is the injunctive norm to wear backpacks; the injunctive norm is measured as the aggregate degree of acceptability for backpack wearing across students in the school (Henry, Cartland, Ruchross, & Monahan, 2004).

Injunctive and descriptive norms do not always describe equivalent social phenomena (Hamm, Schmid, Locke, & Farmer, 2011). For example, in middle schools, it is likely that the large majority of students will not skip classes. However, the injunctive norm may be in favor of missing class if most students perceive this negative behavior as socially accepted or indicative of high social status (Borsari & Carey, 2003). Thus, when examining norms, it is important to not only identify the range of behaviors prevalent in middle schools (i.e., descriptive norms) but also understand students' attitudes about the acceptability of those behaviors (Parkhurst & Hopmeyer, 1998).

It is particularly critical to observe descriptive and injunctive norms as children enter adolescence and transition to middle school. Indeed, during this time, children become more likely to model behaviors after in-group peers (i.e., the small collective of affiliates children interact with on a regular basis; Cairns, Xie, & Leung, 1998) and less likely to model parent or teacher behaviors (Cairns et al., 1998; Galván, Spatzier, & Juvonen, 2011; Sumter, Bokhorst, Steinberg, & Westenberg, 2009). Although much of the work on peer influence has focused on risk taking (e.g., Veenstra, Dijkstra, Steglich, & Van Zalk, 2013), peers also become increasingly important for supporting positive academic behaviors during this time period. Indeed, in a study of suburban, middle-class White students, Masten, Juvonen, and Spatzier (2009) found that associations between peer norms (e.g., descriptive norms among peer group members) and adaptive academic behaviors were evident for students in the middle grades but not elementary grades.

Children do have a natural tendency to select into peer groups with children who are similar to them along a range of attributes, a phenomenon termed *homophily* (Brechwald & Prinstein, 2011; Lazarsfeld & Merton, 1954). In addition to this trend, ecological theories suggest that, within schools, there are a variety of proximal contexts beyond peer groups that influence children's development (Bronfenbrenner & Morris, 1998; Neal &

Neal, 2013). These include the larger school setting in which the members of peer groups interact in early adolescence, as well as a number of smaller micro-contexts in schools (e.g., classrooms, grades; Bronfenbrenner & Morris, 1998). Relationships within these contexts will have unique and interactive effects on students' development.

Norms can be conceptualized at any level. However, ignoring the peer interactions in the broader context of the school will provide only partial information about how academic norms develop within these relational settings. Indeed, Neal and Neal (2013) have argued that a more accurate description of an ecological environment is an overlapping arrangement of structures, connected to the others by the direct and indirect social interactions of their participants. In this model, systems are not necessarily nested within one another. Rather, it is individuals' patterns of social interactions that determine how systems relate to one another. Employing this model helps to clarify the importance of considering how settings at multiple levels—school, grade, classroom—influence students directly, indirectly, and interactively. For the purposes of this article, we describe norms at the level of the middle school, noting the need to consider norms at grade and classroom levels as well (Eccles et al., 1993).

Norms and Academic Behaviors in Middle School

Researchers across disciplines have used a variety of methods to understand the effects of academic norms on academic behaviors (Hamm et al., 2011). Academic behaviors can be conceptualized using a behavioral engagement framework. Behavioral engagement refers to students' participation in school and efforts to perform academic tasks (Fredricks et al., 2004; Suárez-Orozco et al., 2008). Examples of activities that reflect behavioral engagement include participating in class, studying for tests, asking for help with challenging assignments, completing homework, and being prepared for class (Tinio, 2009). In this vein, we define descriptive academic norms as the extent to which students in a given middle school exhibit positive academic behaviors at the aggregate level (Schultz, Nolan, Cialdini, Goldstein, & Griskevicus, 2007). In contrast, the injunctive norm perspective defines academic norms as the degree of *consensus* among all students in a school about the acceptability of these positive academic behaviors (Bishop & Bishop, 2007).

A number of studies have linked academic norms at the peer group level to early adolescents' academic outcomes, such as motivation, grade point average, and standardized test scores (Crosnoe, 2000; Kindermann, 1993; Kindermann & Skinner, 2009; Ryan, 2000; Wentzel & Caldwell, 1997).

Descriptive academic norms at the peer group level also predict positive changes to individual students' behavioral engagement in school (Hughes, Luo, Kwok, & Loyd, 2008; Li & Lerner, 2011; Ryan, 2001). In a study of suburban White students from working and middle-class backgrounds, Kindermann and Skinner (2009) found that levels of behavioral engagement within sixth graders' peer groups (i.e., descriptive academic norms) were associated with children's individual levels of academic motivation. Such processes may have positive effects for academically engaged peer groups. Indeed, in a sample of primarily White suburban students, Véronneau and Dishion (2011) found that gains in academic achievement between sixth grade and eighth grade were larger than expected among students with friends who had high levels of behavioral engagement. Moreover, Kindermann (1993) found support for the additional contention that normative contexts matter when he identified more variation in behavioral engagement *between* peer groups than *within* peer groups in a sample of White lower-middle to middle-class fourth- and fifth-grade students.

Although much of this past work on peer norms has conceptualized norms as descriptive, work from social psychology suggests that injunctive norms are particularly influential in early adolescence, as they carry social sanctions for noncompliance (Hamm et al., 2011). Indeed, norm theory argues that individuals are more influenced by their *perceptions* of norms than by actual average levels of behaviors in a setting (Lapinski & Rimal, 2005). A recent study by Hamm and colleagues (2011) identified empirical support for this hypothesis in a racially/ethnically diverse sample of rural sixth-grade students. After accounting for teacher reports of student academic competence in the beginning of the school year, the authors found that peer group injunctive norms predicted changes in students' school valuation and effort across the transition to middle school. When injunctive norms were different from descriptive norms, they were more likely to be associated with academic competence, as well as homework completion, school valuing, and school belonging. In other words, even when the descriptive norm suggested few positive academic behaviors at the aggregate, if students perceived that positive academic behaviors were more acceptable among students, adaptive academic outcomes were likely (Hamm et al., 2011).

A separate body of research in economics has sought to estimate the causal impact of academic norms on student achievement, using rigorous statistical models to capture peer effects on academic achievement. Econometric studies have found inconsistent results for the influence of academic norms, typically measured descriptively at the school setting level, on student test scores (Angrist & Lang, 2004; Lavy, Silva, &

Weinhardt, 2009). For example, Abdulkadiroglu, Angrist, and Pathak (2011) showed little evidence for the effect of selective high schools, which enroll large proportions of high achieving students, on student test scores. In contrast, Burke and Sass (2013) used fixed effects models to isolate normative influence effects on student learning. They concluded that peer effects on achievement depend on an individual student's own ability and the ability level of other students in the school. Such quantitatively rigorous evidence suggests the importance of considering norms as a differential function of students within a broader context.

Thus, research has illuminated the role of *both* descriptive and injunctive academic norms in shaping individual academic behaviors. Yet, few conceptualizations and operationalizations of academic norms have considered students' differential contributions to academic norms. Indeed, it is likely that some students will have greater influence in developing and maintaining academic norms, depending on the extent to which they are connected to other students in the school or grade.

Friendship Networks

Although most research on norms at the peer group level has focused on relationships between students, this work has largely overlooked the idea that relationships between students are a form of social structure, defined by the pattern of connections between students within a given relational context such as a school, grade, or classroom (Neal, 2007). For instance, an example of the type of question asked to middle school students in a study of peer relationships might read something like "Agree/Disagree: My friends participate in class." In this question, the researcher only learns something about that student's perceptions of his or her friends' behaviors. Nothing is learned about who the reporter's friends are, and how their friendship structure looks within the broader relational setting (e.g., school, grade). Yet, previous work using social network theory suggests that the relational structure of the school friendship network has powerful and unique influences on student behaviors (Rizzuto, LeDoux, & Hatala, 2009). Building on this extant literature, we use the following section to explain fundamental theory and research on social network approaches, and argue for the importance of friendship networks for research on middle school academic norms.

A social network perspective views friendships in terms of nodes and ties. Nodes are individuals within the relational setting—the middle school in the case of this article—and ties are friendship connections between nodes (Borgatti & Ofem, 2010). Social network conceptions are based on five primary principles. The first prioritizes relationships between actors within a

network over attributes of individuals (Laumann & Youm, 1999; Wellman, 1988). Second, the relational structure of the whole setting is of interest rather than the individual relationships that occur within that setting. Third, the network itself is the focus rather than discrete group membership. Fourth, social network analysis uses structural rather than individualistic methods to examine setting-level phenomena. At the setting level, network theories provide data on the overall structure of the network. At the student level, network approaches focus on the actor's position within the relational context (Neal, 2007). Finally, and most fundamental to this article, is the tenet that normative behaviors are a product of the social network (Wellman, 1988). In this framework, knowledge of students' positions in the relational network is combined with knowledge about students' behaviors or attributes to identify norms for that setting.

As reviewed by Kadushin (2004), social scientists have investigated a number of different types of social networks (e.g., egocentric, open system). The present article focuses on socio-centric social networks: Specifically, socio-centric friendship networks in middle schools are bounded in a closed system either by physical or social space, or superficially by a researcher. A middle school is an example of a closed system, as there are clear boundaries that can be drawn around the actors who make up that network. Within the bounded network, there are numerous ways to measure connections between students (e.g., nominations for "like most," "like least," "look up to"). During early adolescence, children spend a large proportion of their time with other children they report to be their friends (Knecht, Snijders, Baerveldt, & Raub, 2010). These friendships include reciprocal exchanges that emphasize sharing, disclosure, trust, loyalty, and emotional support (Berndt & Murphy, 2002).

Researchers have identified friendship networks, sometimes operationalized as "hanging out networks," as particularly salient for middle school students (Molloy, Gest, & Rulison, 2011). When collecting information on friendships, children are simply asked to report on whether each student in their middle school is their friend or hangs out with them (Rodkin & Ahn, 2009). A different approach in the developmental literature is that of social cognitive mapping wherein students are asked to report on other students' social networks (e.g., Cairns, Leung, Buchanan, & Cairns, 1995; Farmer & Xie, 2012). Regardless of methodology for assessing the network, it is critical to measure and understand children's friendships in middle school given that more than half of friendships in early adolescence will be formed within schools (Neal, 2010), and friendships are consistently linked to positive academic outcomes for youth (Eccles & Roeser, 2011; Hartup, 1996; Wentzel, Barry, & Caldwell, 2004).

Social Networks and Middle School Academic Norms

By using friendship networks to describe relational structures of settings, this article builds on previous work that focused mostly on measuring the frequency of interactions among peers. In much prior research, researchers have emphasized the importance of direct, regularly occurring processes as the proximal settings in which individuals acquire competencies, learn social skills, and develop behaviors (Dishion, Andrews, & Crosby, 1995; Kindermann, 2007). Theory on friendship ties, however, informs a broader understanding of how connections between individuals in a setting help explain behaviors in that context. For example, Neal (2007) noted that social network research in schools focuses explicitly on students' *positions* in the broader network rather than on individual student attributes. This framework, termed *structuralism*, implies that external forces, such as the size and shape of individuals' social networks, drive behavior (Neal, 2007; Wellman, 1988).

Thus, network or structural theories are relevant to building a more complete conceptualization of middle school academic norms. Most studies of social norms do not measure how individuals contribute differentially to the development of norms at the setting level. In schools, however, there are students located centrally in the school network whose behaviors are likely to have a greater contribution to the development and maintenance of norms than students who are less central (Wellman, 1988). Indeed, empirical studies have found evidence that highly central actors within a context exhibit the normative behaviors of the networks as a whole (e.g., Gest, Osgood, Feinberg, Bierman, & Moody, 2011; Kratzer & Lettl, 2009).

In this vein, there is an opportunity to integrate social network tenets with literature on descriptive and injunctive norms (Neal, Neal et al., 2011). For example, although a number of studies have found it helpful to use descriptive norms to simply describe average levels of academic behaviors in school settings (e.g., Hamm et al., 2011; Lynch, Lerner, & Leventhal, 2013), injunctive norms are independently important for driving behavior change, particularly during adolescence (Galván et al., 2011; Gorman, Kim, & Schimmelbusch, 2002; Juvonen & Cadigan, 2002). Accordingly, one would anticipate a high degree of overlap between the friendship connections in the social network, the academic behaviors of central students, and the degree to which students within the setting endorse the acceptability of academic behaviors (Simons-Morton & Farhat, 2010).

Centrality is the first social network characteristic important for conceptualizing middle school norms. Definitions and measurement of network centrality vary in the literature. In this article, we use one particular

measure—Freeman's (1979) conceptualization of degree centrality (the number of connections students have to other students in the network, relative to the number of possible connections; measured at the student level)—to describe the construct of network centrality because of its intuitive application to a discussion of normative behaviors. We recognize this definition does not integrate other conceptualizations of network centrality, such as that derived from social cognitive mapping procedures, which focus specifically on individual and group prominence. Across studies, however, network degree centrality represents the core principle that the individuals with the greatest number of direct and indirect connections to other students are most central within the bounded network. Employing this conceptualization, highly central network actors facilitate a brisk and directed flow of information directly to one another and through their connections to the larger network (Neal, Neal et al., 2011; Wellman, 1988).

Two other salient types of centrality are betweenness centrality and closeness centrality. Betweenness centrality is based on the extent to which an actor facilitates the flow of information by being positioned on many information paths. If an actor with high betweenness centrality is removed from the network, the speed and certainty of transmission from one arbitrary point to another are damaged more than in cases where an actor with low betweenness centrality is removed (Borgatti, 2005). In contrast, closeness centrality is defined as a given actors' total graph-theoretic distance from all other actors in the network. This is an index of the expected time it will take information to flow through the network in order to reach a given actor (Borgatti, 2005). Because the current article seeks to advance theory linking norms and networks in the most intuitive way possible, we focus on degree centrality for the remainder of the article. However, in unique situations where actors with high degree centrality actually appear to be somewhat isolated, or where flow of information exchange is particularly salient, there is also merit in considering the roles of betweenness and closeness centrality.

Similar to injunctive norms, information exchanges through highly central figures provide social pressure toward uniformity in opinions and behavior (Borgatti, 2005). One can imagine two different middle school settings with similar network structures. In both, there are three centrally located individuals and a similar number of connections between those students and the larger network. In Middle School A (see Figure 1), all three students exhibit positive academic behaviors; they complete homework, attend class, actively participate in class, and receive high grades. However, in Middle School B (see Figure 2), only one of the central students exhibits a high degree of productive academic behaviors. The other two individuals do not actively engage in delinquent or antisocial behaviors, and do not take academic work very

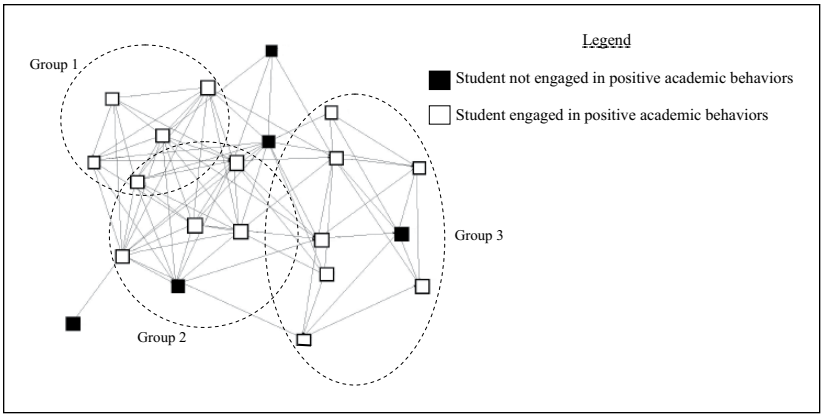

Figure 1. Middle School A friendship network.

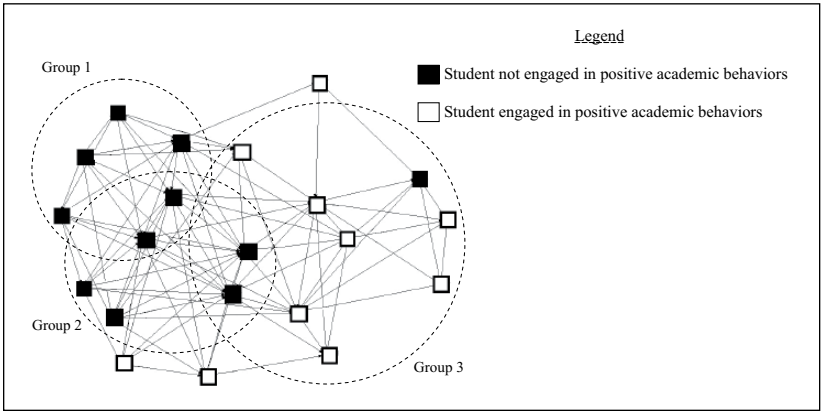

Figure 2. Middle School B friendship network.

seriously; they miss class sometimes, fail to complete homework, and receive mediocre grades. Based on the theory of centrality advanced by a social network perspective, we can assume that productive academic behaviors will be normative at Middle School A. Yet, due to the heterogeneity in behaviors of highly central students in Middle School B, a norm supporting positive academic behaviors is likely to be less strong.

Although students' centrality can be intuitive for understanding how network characteristics define middle school academic norms, it does not fully

explain the norms we would observe in a middle school context. Another network property that will be important to consider is that of network closure (Coleman, 1988; Flynn, Reagans, & Guillory, 2010). Network closure represents the property that if Student A is connected to Students B and C, then Students B and C are likely connected. Coleman (1988) argued that schools with high degrees of intergenerational network closure—wherein students' parents were connected to other students' parents—were more likely to engender academic norms toward achievement. Applying this same premise to students in a school, we can argue that if a highly central student with positive academic behaviors is connected to two other students, who are also connected to one another, the diffusion of information from the highly central student to the other students will be more efficient and more supportive of a positive academic norm. Thus, a network where there is a high degree of network closure, in addition to having highly central students engaged in positive academic behaviors, will be most reflective of a positive normative academic context.

Network closure, although encompassing a structural property of the network, does not necessarily take into account the extent to which all students within the bounded context are connected to one another. One final network property—density—is important for describing such friendship connections (Borgatti, 2005). In a friendship network, density is simply the proportion of all possible ties that are actually present. Having information about the density of the network may provide insight into the speed at which information will diffuse among students (Hanneman & Riddle, 2005). For example, in a highly dense network, there are a large number of connections between students and information flow is fast and efficient. In a less dense network, there are fewer connections between students and information exchange is slower and, in a sense, less powerful (Borgatti, 2005). In sum, individual positions in the school network, as well as network structure—closure and density as described here—are relevant for conceptualizing middle school academic norms (see Figure 3).

Although this study is focused on conceptualizing academic norms, linking those norms to adoption of positive academic behaviors provides additional impetus for their study. Neal, Neal, and colleagues (2011) have identified two theories of diffusion—cohesion and structural similarity—as different mechanisms influencing individual behaviors in the context of the network. The cohesion perspective emphasizes direct connectivity between individuals in a setting (see Figure 4). In line with theories about network centrality, this is perhaps the most intuitive understanding of diffusion, suggesting that ideas pass from person to person to person through direct and short, indirect ties to one another (Coleman, Katz, & Menzel, 1966; Friedkin,

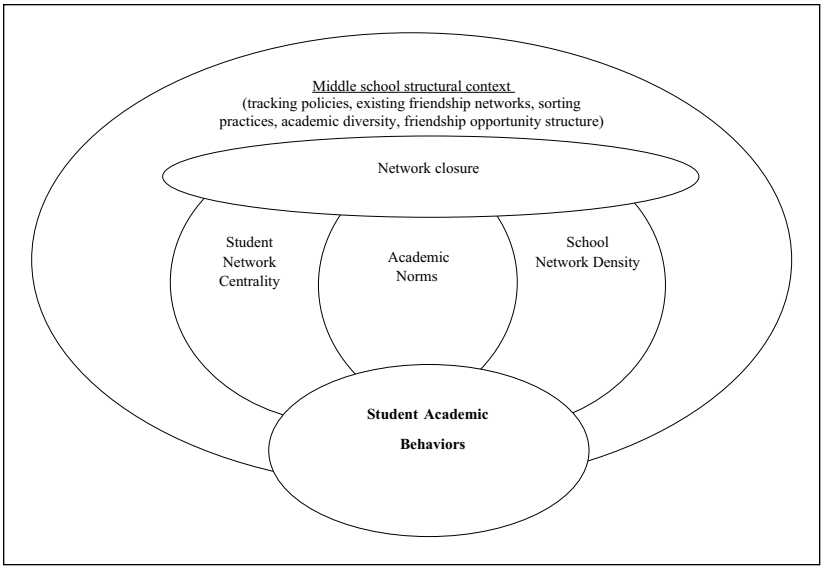

Figure 3. Conceptual framework for relating students' friendship networks and middle school academic norms.

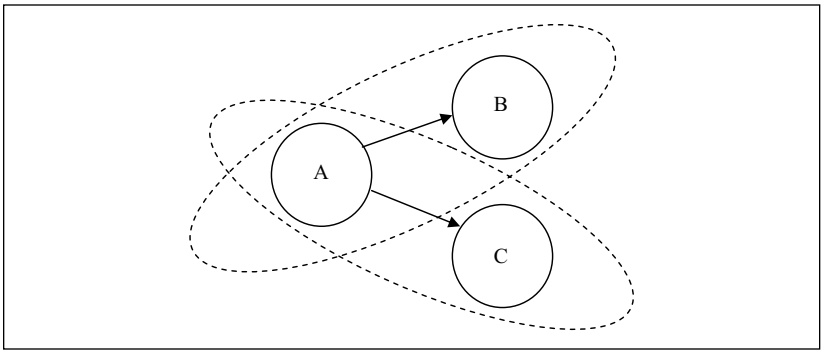

Figure 4. Cohesion principle: Information flows through direct network connections.

2004). These linkages facilitate brisk and directed flow of information. In addition, because the linkages not only objectively reflect the transmission of information like telephone wires but also reflect the subjective feelings that

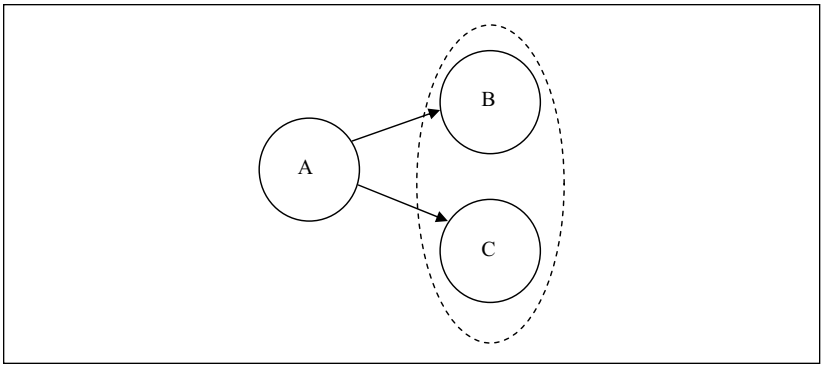

Figure 5. Structural similarity principle: Information flows through actors who occupy similar roles in the network.

accompany interpersonal relationships, they provide social pressure toward uniformity in opinions and behavior. In this way, direct connections between actors influence individual behavior.

Structural similarity, on the other hand, focuses on individuals' roles within the setting and suggests that ideas (e.g., attitudes about academic behaviors, importance of education) spread among individuals who occupy similar roles (Burt, 1987; Friedkin, 2004). For example, in a triad where Student A is connected to both Students B and C, Students B and C occupy similar network roles (see Figure 5). According to the theory of structural similarity, there are two related mechanisms that drive the process of information exchange. First, individuals who occupy the same roles in a social setting are subject to common resource and normative contexts, and thus may seek to retain their status by adopting the same options as their potential competitors (Burt, 1999). Second, individuals faced with uncertainty about how to behave in a given situation may look to others for a solution. Perhaps surprisingly, some studies show that although cohesion is important for information exchange, structural similarity is more related to the adoption of behaviors (Galaskiewicz & Burt, 1991; Neal, Neal et al., 2011). Relatedly, Burt (1999) has argued that diffusion actually operates as a twofold process wherein influence is first spread through cohesion and later spread by structural similarity.

To illustrate the relevance of these theories, we can apply both the cohesion and structural similarity perspectives to an example about the implementation of a peer assisted learning program in a middle school. In such a framework, there are eighth-grade students tasked with tutoring sixth-grade

students who have recently transitioned to middle school and are having some academic trouble. Thus, each eighth-grade tutor is directly connected to up to four sixth-grade students, who may or may not be connected to one another. The cohesion mechanism would speculate that the extent to which information exchange among sixth-grade students following a sixth grader's positive experience with his or her tutor depends on how many connections the tutored student has within the grade, and how many subsequent connections those individuals have. If he or she is centrally located in the network, it is likely that any positive influence of the tutor will benefit the larger network through diffusion of information across the grade. Structural similarity, however, suggests that one must examine how the sixth-grade students who are connected to the same eighth-grade tutor, and thus occupy similar network roles, responded to the tutoring. Given that these sixth-grade students are subject to common resource and normative contexts, they are likely to act similarly and may or may not adopt positive behavior change in a dual or group manner. Thus, students' academic behaviors may be driven by other students who hold similar network roles to them and not necessarily by the students in the network with a large number of connections. In line with Burt (1987), we argue that both the cohesion and structural similarity mechanisms can help explain how centrality, network closure, and density will contribute to and maintain positive middle school academic norms depending on how and where the exchange of information related to positive academic behaviors takes place.

The argument offered in this article may seem similar to research showing that individuals with high levels of "perceived popularity" have a large degree of influence over less popular peers' behaviors. However, studies of popularity (e.g., Galván et al., 2011; Gorman et al., 2002) typically ask students to report on the degree to which behaviors are associated with social status. This aggregate perception is conceptualized as an indicator of peer influence rather than a social norm. Measures of peer influence do not account for the structural context of the relational network where students form friendships. Interestingly, studies of popularity generally find modest associations between the actions of adolescents described as popular and the majority of students (Rose & Swenson, 2009). Building on this work by considering students' friendship networks can help conceptualize a more nuanced understanding of middle school academic norms, measured at the structural setting level.

The theories advanced in this article have empirical support. For example, Valente, Gallagher, and Mouttapa (2004) conducted a social network analysis to identify normative alcohol and substance abuse in a high school setting. They found that in schools where the most centrally located students were

engaged in alcohol and substance use, students in the broader school context were more likely to drink and use drugs. Studies of academic norms suggest that when high achieving students are centrally located within the network, the school as a whole will exhibit achievement-related behaviors (Gest et al., 2011). Although most descriptive and predictive research using network conceptualizations of norms has focused on high school samples and negative behaviors (e.g., drinking, smoking), a recent study by Hamm, Lambert, Agger, and Farmer (2013) focused on academic behaviors among a sample of rural African American middle school boys. The authors used a social cognitive mapping procedure to identify social networks among the sample and then measured the norm for academic effort and achievement as the aggregate of individual group members' scores on a survey of peer norms for effort and achievement. Hamm et al. subsequently linked these norms, operationalized specifically at the network level, to greater levels of school valuing and overall likability across the year.

In sum, this article has applied the premises of structuralism to the study of norms, explicitly conceptualizing middle school academic norms as a setting-level phenomenon (e.g., school, grade, classroom) by concentrating on the network characteristics of network centrality and density. In addition, we have considered how students' positions within schools contribute to the development and maintenance of middle school academic norms. In this model, the academic norms of the middle school are the productive academic behaviors (completing homework, attending class, valuing high grades) engaged in by central students. The degree to which the norm is made salient is dependent on the extent to which there is network closure, as well as the density of friendship connections in the school. Thus, a positive academic normative context would be one in which students with the highest degree of centrality, within a network of high density and network closure, engage in a consistently high level of positive academic behaviors.

Predicting Middle School Academic Norms

We now discuss how one can apply a social network framework to understand structural factors contributing to academic norms in the middle school setting. The first of these structural characteristics is the middle school transition itself; 90% of children in the United States make a transition to a new school in the middle grades (e.g., sixth and seventh grades; Cook, MacCoun, Muschkin, & Vigdor, 2008). Students change schools while undergoing the developmental transition to adolescence, thus navigating a range of social and biological stressors while adjusting to a wholly new—and more complex—peer and educational context (Seidman et al., 2004). On average,

the transition to middle school is associated with decreases in academic efficacy expectations, class preparation, and overall school performance (Burchinal, Roberts, Rowley, & Zeisel, 2008; Hill & Tyson, 2009; Seidman, Allen, Aber, Mitchell, & Feinman, 1994). In addition, the salience of the social network is particularly high among early adolescents (Neal, 2007). Taken together, these shifts suggest a critical period and setting within which to examine the development and maintenance of friendship networks and academic norms.

Second, the existence of school grouping policies might restrict students' opportunities to form friendships with other students in the middle school network. Based on a combination of elementary school teacher recommendations, grades, and test scores, students are likely to be placed into groups of similar achievers when they begin middle school (Oakes, 2008). Differentiated curricular experiences for students of varied ability levels structure experience and behavior in three major ways: (a) quality and kinds of opportunities to learn (Oakes, 2008), (b) exposure to peers (Dishion, Poulin, & Burraston, 2001), and (c) a social comparison group to assess academic ability (Eccles & Roeser, 2011; Marsh, Trautwein, Ludtke, & Brettschneider, 2008). Given this existing structure, students are constrained in their choice of friendship connections upon arriving at middle school. However, the degree of academic diversity in the school plays a role in this selection process. Some schools enroll a large proportion of students consistently engaged in positive academic behaviors; other schools do not (Condron, Tope, Steidl, & Freeman, 2012). In settings where academic diversity is limited so that most students are not engaged in positive academic behaviors, there are few opportunities for nonengaged students to interact with academically engaged peers. This opportunity structure may moderate the extent to which changes in academic norms are observed and possible.

In this article, we focus specifically on the middle school transition and academic homogeneity as key structural factors related to academic norms. We do this to add to the broader literature linking such factors to poor academic outcomes, arguing that the normative context may be an explanatory factor in this association. However, we do recognize there are a host of other structural factors likely to affect the development and maintenance of academic norms in middle school settings (see Figure 3). These factors include the size of the peer group, whether teachers are subject specialists, how students are assessed in the middle school, and how students are grouped into classes. Future work seeking to understand how school-level policies influence middle school academic norms will benefit from empirically examining these relationships more closely.

Directions for Future Research

We argue that there are a number of directions future research can take to better understand academic norms in middle schools and their application to students' academic behaviors. A major implication from this conceptual study is the idea that researchers can begin to construct measures of norms that take into account the most central actors in a setting, possibly by weighting norms by the behaviors of the most central actors. In addition, the strength or valence of that norm can be more fully described by also integrating indices of network closure and network density into the measurement of the norm. Such an approach considers the differential contribution of students in the network to the norms in the setting while at the same time accounting for the setting-level structural ties between students. By using such a network operationalization, researchers can conduct empirical studies to predict academic outcomes (e.g., achievement, engagement, motivation) directly from contextual norms. Researchers can examine these questions within the bounded middle school networks that are most salient to their interest (classroom, grade, school).

In addition, future operationalizations of norms can also incorporate density. For example, it might be helpful to pair the weighted norms with the network density measure to describe whether the weighted academic norm exists in a network with high, moderate, or low density. Higher levels of density would suggest stronger academic norms. Similarly, higher levels of network closure in the setting might also indicate stronger academic norms. More specifically, however, one could actually describe norms using information about the extent to which there is network closure among students with high academic engagement. Finally, with respect to structural similarity, researchers could operationalize academic norms based on the extent to which academically engaged individuals within the network share similar roles. In cases where this is common, one would expect the academic norm to be stronger. Future measurement articles should seek to examine and validate such conceptualizations of academic norms using these frameworks.

Critical to this measurement work is that network assessments are gathered at multiple time points. In this way, the stability and reliability of the conceptualization of middle school academic norms, based in a social network framework, can be assessed regularly. Moreover, when data on students' friendship connections are collected across time, middle school academic norms can be considered within the context of a dynamic system. Although emerging research has considered changes in networks over time, research on academic norms rarely examines how norms change over time, and how structural shifts in social networks may predict those changes. With

multiple data points, researchers can use longitudinal network models (e.g., stochastic actor based models) to test how the mechanisms for behavior change identified in this study—cohesion and structural similarity—influence academic behaviors and outcomes over time (Snijders, Van de Bunt, & Steglich, 2010). Although we have focused primarily on the pattern of relationships between students, it may be important for future research to also consider the strength or valence of network ties.

Applying these recommendations, academic norms measured with social network indices should be considered as a primary outcome of school-based programs that cite improvements in supportive academic norms in their theories of change. Emerging research has sought to examine norms as an outcome of an intervention seeking to reduce delinquency and antisocial behaviors in middle school settings (e.g., Osgood et al., 2013). Indeed, some whole school reforms identify an improvement in norms that support positive behaviors as a critical conduit for impacting individual outcomes. Yet, intervention research has yet to empirically test whether interventions specifically designed to change the norms, or patterns of interactions between individuals in schools, actually do so with respect to academic behaviors. Thus, future work should consider using academic norms as conceptualized in this article to measure outcomes for interventions that aim to improve academic behaviors, attitudes, and achievement. By using a structural framework, researchers can quantify norms by determining whether the most central actors are engaged in positive academic behaviors, and whether the network as a whole has improved in the extent of network closure or density of social connections. Investigators can use information to track pre- and post-intervention change in norms, and to examine how improvements in academic norms mediate the effects of interventions on student outcomes. Such research will serve to illuminate the "black box" of school-based intervention.

Conclusion

Recent efforts to reform schools in the United States have focused almost exclusively on improving accountability systems and student standardized test scores (Sunderman, 2010). Yet, given research showing that school contextual factors (e.g., norms, climate) are critical to the healthy development of children (Romasz, Kantor, & Elias, 2004), there is growing interest in identifying how factors like middle school academic norms relate directly to student achievement (Bradshaw, Koth, Thornton, & Leaf, 2009). Indeed, there is evidence that students benefit when teachers are aware of social networks and norms. Farmer, Lines, and Hamm (2011) have found that teachers have an "invisible hand" in promoting students' self-directed, autonomous, and

developmentally productive peer experiences. When teachers have a greater understanding of empirically derived norms based on peers' social positions, they can better position themselves to direct classroom procedures, make instructional decisions that account for student social dynamics, and support positive peer relationships (Cohen & Lotan, 1995; McFarland, 2001). Policy makers, too, are interested in how academic norms shape achievement. Two of the largest school districts in the country—Chicago and New York City—use information on school context in the scores that make up public school accountability reports (see Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Nathanson et al., 2013). Yet, there is a lack of consensus about the tools that can be used not only to measure one of these key contextual factors—academic norms—but also to conceptualize it. Given this critical gap in empirical and theoretical understanding, this theoretical article can provide needed information to a wide audience on how to conceptualize academic norms using information about students' positions within social networks.

In this article, we focused specifically on middle schools because they face unique challenges in creating a positive school climate and culture that support students' academic development (Eccles & Roeser, 2011). Engendering an academically supportive school context can be particularly difficult when children are in early adolescence, given the increased emphasis placed on friendships, social groups, and romantic linkages, relative to academic activities (Connolly, Craig, Goldberg, & Pepler, 2004; Oberle, Schonert-Reichl, & Thomson, 2010). Teachers and administrators often find it difficult to understand their students' social ties and the norms that are a product of those ties (Gest, 2006; Neal, Cappella, Wagner, & Atkins, 2011). Thus, in addition to identifying empirical questions for future researchers, the framework developed in this article can help schools better conceptualize students' connections and norms at multiple levels (e.g., school, grade). School policies and programs can use information on network connections to identify improvements in norms attributed to programming. Interventions that focus on students' friendship networks can assess the role of highly connected students in creating and maintaining norms, and influencing behaviors. Future empirical work should model relations between network position and middle school academic norms. And finally, rigorous methodologies that explicitly account for network self-selection should be assessed in order to more appropriately model the causal effects of network structure on norms at the school ecological level.

Authors' Note

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