CHAPTER 3

PEER INFLUENCE PROCESSES WITHIN CLASSROOMS: THE ROLE OF TEACHERS' EMOTIONAL SUPPORT IN CONTAGION OF DISRUPTIVE BEHAVIOR

Classrooms are highly social places. Students in elementary school spend much of the school day interacting with their friends and peers in classrooms. Students have on-going and dynamic relationships with peers in classrooms. Students make choices about who to become friends and hang around with, and their friends play an important role in the development of achievement beliefs and behaviors in the classroom. Students tend to select friends with similar attributes but above and beyond initial similarity, friends matter for changes in students' engagement across the school year. Having classroom friends who are themselves highly engaged promotes engagement whereas having classroom friends who are themselves disengaged dampens engagement over time (Altermatt & Pomerantz, 2003; Kindermann, 1996; Molloy, Gest & Ruilson, 2011).

However, most research on peer influence on engagement of students has ignored the fact that students and their peers are nested within classrooms. The context varies greatly between classrooms, and this variability matters for students' academic and social adjustment (Hamre & Pianta, 2005; Chang, 2004; Jonkmann, Trautwein, & Lüdtke, 2009; Sentse, Scholte, Salmivalli, & Voeten, 2007; Stormshak et al., 1999). It is highly likely that variations in classroom context would also matter for peer selection and influence processes. The extent to which students choose similar others, and are attracted to friends with certain attributes might vary by classrooms. Further, the magnitude of friends' influence would also vary by classroom depending on the nature of the context.

The purpose of this study is to examine how peer selection and influence processes vary

by classrooms with a focus on disruptive behaviors. Disruptive behaviors such as talking out of turn, getting out of one's seat, disrespecting others has been acknowledged as a growing problem and serious concerns of teachers (Elam, Rose, & Gallup, 1996; Kaplan, Gheen, & Midgley, 2002). Given the importance of teacher's emotional support for many aspects of students' social and academic adjustment, I investigate if classrooms with different levels of emotional support from the teacher have different patterns of peer selection and influence of disruptive behavior. To build my rationale for the study, I first discuss peer selection and influence processes in general and then in relation to disruptive behaviors. Next, I review prior research examining classroom variations in peer relations and academic behaviors. Finally, based on prior research findings I propose how different levels of teachers' emotional support are likely to be associated with early adolescents' peer selection and influence processes on disruptive behavior.

Peer Selection and Influence Processes in Classroom

At the beginning of the school year, students forge relationships and find their social role in the complex and multi-faceted peer ecologies within classrooms and schools (Farmer, Lines & Hamm, 2011). In the classroom, students make choices about how to behave and who to interact with that affect the formation of friendships in the classroom. Social interactions and the negotiation of friendships are ongoing and dynamic processes in classrooms (Farmer et al., 2011; Tenney, Turkheimer & Oltmanns, 2009). Emerging out of these interactions and negotiations is a tendency for students to be friends with similar peers. This phenomenon of similarity amongst friends is known as homophily and is seen on a variety of characteristics including academic characteristics (Brown, Bakken, Ameringer & Mahon, 2008). Contributing to homophily is both *selection*, the extent to which peers with similar attitudes and behavior seek one another as affiliates, and *influence*, the degree to which affiliates become more alike in attitude and

behavioral tendencies because of their frequent interaction (Veenstra & Steglich, 2012). Students may select friends who are similar to them in classroom behaviors as it may meet their goals and be consistent with their prior behavioral tendencies. Most theory and research concerning peer relations has assumed that students select similar others for friends (e.g., Altermatt & Pomerantz, 2003; Kindermann, 1996; Molloy et al., 2011; Ryan, 2000). However, in Study 1 we found selection did not play as pervasive a role as previously assumed although students did select similar others in regards to academic self-efficacy and G.P.A.

Whether or not students select similar friends they may become more similar over time via socialization. Friends are theorized to socialize adolescents' academic behaviors through such processes as information exchange, modeling, and reinforcement of peer norms and values (Kindermann & Gest, 2009; Ryan, 2000). Observing others perform a particular behavior or voice a certain belief can introduce an individual to new behaviors and viewpoints and also inform an individual of the consequences of such behaviors and opinions. Depending on the consequences, observation of a model can strengthen or weaken the likelihood that the observer will engage in such behavior in the future (Bandura, 1971; Masters & Mokros, 1975, Sagotsky & Lepper, 1982; Altermatt & Brody, 2009). Social reinforcement is presumed to be a mechanism (Berndt, 1992; Prinstein & Dodge, 2008). Behaviors that are discouraged or received negatively by friends are less likely to be displayed again by an individual. Conversely, behaviors that are encouraged or positively received by the friends are more likely to surface again in the presence of one's friends.

Research has demonstrated that when students are placed in classrooms that contain many problem behaviors, they tend to display more problem behaviors over time, moving toward the group average (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Thomas, Bierman, & the

Conduct Problems Prevention Research Group, 2006). When students are with multiple peers with disruptive behaviors, students would have more opportunities to adopt friends' disruptive behaviors. A high prevalence of disruptive behaviors among students in classrooms would create social norms that support disruptive behaviors (or are less disapproving of disruptive behaviors), as students are generally more accepting of behaviors and attitudes that are shared by a majority of their peers (Stormshak et al., 1999; Wright, Giammarino, & Parad, 1986). Peers may model and reinforce disruptive behaviors with laugher or encouragement, in a process termed "peer contagion" (Snyder et al., 2008).

Variations in Social Relations and Academic Behaviors across Classes

Classrooms vary in regard to the nature of peer relations and academic behaviors (Boivin, Dodge, & Coie, 1995; Chang, 2003, 2007; Hughes & Kwok, 2007; Hughes, Cavell, & Jackson, 1999; Meehan et al., 2003). Different teachers' practices (i.e., teachers' beliefs and attitudes, level of warmth and caring) are associated with varied peer relations and academic behaviors (Chang, 2003, 2007; Stromshack, Bierman, Bruschi, Dodge, & Coie, 1999; Gest & Rodkin, 2011; Hughes & Chen, 2011). Researchers have investigated various dimensions of peer relations including peer acceptance and liking (Furrer & Skinner, 2003; Ladd et al., 1999), peer rejection or victimization (Buhs, 2005), the number and characteristics of one's friends (Altermatt & Pomerantz, 2003; Kindermann, 1993), and one's reputation within the peer group on various characteristics such as popularity, aggression, or academic competence (Gest, Domitrovich, & Welsh, 2005; Risi, Gerhardstein, & Kistner, 2003). Multiple dimensions of peer relations varied across classrooms, and teachers' attitudes/beliefs and teachers' emotional support (i.e., warmth and caring) was associated with the nature of the peer social ecologies in the classroom.

When teachers were warm and caring, students were less rejecting of peers than when teachers had very negative beliefs about students with problem behaviors (Chang, 2003).

Teachers' preference of behaviors affects the extent to which students adopt those behaviors based on their teachers' like or dislike (Chang, 2007; Gest & Rodkin, 2011). When teachers expressed empathy and support for withdrawn students, students' peer relations were characterized by higher patterns of liking and diminished pattern of disliking classmates. When teachers showed disapproval of aggression, students in those classrooms perceived fewer classmates as aggressive. When teachers paid much attention to separating students with behavioral problems, students reported higher levels of peer acceptance and denser friendships (Gest & Rodkin, 2011). Teachers' emotional support has also been linked to changes in students' peer acceptance, liking and academic reputation over time (Hughes & Chen, 2011).

Results suggest that teachers' different beliefs and attitudes, and teachers' emotional support affect students; thus are associated with students' own liking or disliking of peers' behaviors and various aspects of students' peer relations, and ultimately affect students' own behaviors. Teachers affect the classroom peer ecologies as they attempt to guide students toward successful learning and adjustment. Depending on the teacher characteristics and practices (i.e., beliefs and attitudes, emotional support), classrooms may differ in the social support they provide to academic behaviors (Boivin, Dodge, & Coie, 1995; Chang, 2003, 2007; Wright, Giammarino, Parad, 1986). In classrooms where students are emotionally connected to teachers, students are more likely to appreciate the importance of hard work and engagement, and create more positive peer culture for academic adjustment. On the other hand, when students are not emotionally connected to teachers, students are more likely to create peer cultures that are adverse to positive academic development (McFarland, 2001).

Classrooms vary in teachers' emotional support and such variability matters for students' peer relations and academic behaviors (Hughes & Kwok, 2007; Hughes, Cavell, & Jackson, 1999; Meehan et al., 2003; Hughes, Cavell, Willson, 2001; Hughes, & Kwok, 2006; Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Pianta, Steinberg, & Rollins, 1995; Silver, Measelle, Armstrong, & Essex, 2005). I propose that teachers' emotional support is also likely to be associated with students' peer selection and influence processes on disruptive behaviors. The extent to which students desire to be friends with disruptive peers will vary across classrooms and this variation will be explained by teachers' emotional support in the classroom. Further, the magnitude of peer influence on disruptive behavior will vary across classrooms and this variation will also be explained by teachers' emotional support.

Teachers' Emotional Support and Peer Influence Processes

Teachers' emotional support encompasses interactions that reflect the emotional climate of the classroom as evidenced by the warmth and/or negatively present in the classroom interactions, as well as the emotional connection between the teacher and the students. It includes how warm and respectful the teacher acts toward the group of students of his/her class, and how sensitive the teacher is in interaction with their students. Sensitive teachers who create a positive emotional classroom climate tend to be aware of the students' level of academic functioning and are responsive to their needs (La Paro, Pianta, & Stuhlman, 2004; Pianta, La Paro, & Hamre, 2006).

Teachers' emotional support provides a positive learning context in which students can have supportive peer interactions to adopt engagement behaviors, and have minimal opportunities for learning friends' disruptive behaviors. Teachers influence students' peer interactions (Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Pianta, Steinberg, & Rollins,

1995; Silver, Measelle, Armstrong, & Essex, 2005) by providing students with positive behavioral supports and teaching appropriate behaviors. Students may be more motivated to learn academically appropriate behaviors with peers when they have emotionally supportive teachers (Hamre & Pianta, 2001). Further, teachers who are more sensitive to students' academic needs would be more responsive to acts of disruptive behaviors and try to impede those behaviors. When students observe teachers intervening in disruptive behaviors, teachers' actions may model ways to intervene disruptive behaviors and different norms of academic behaviors are established in which disruptive behaviors are less tolerated in that classrooms (Hamm, Farmer, Dadisman, Gravelle, & Murrary, 2011).

I draw on these research findings to propose that teachers' emotional support would be associated with early adolescents' peer selection and influence processes on disruptive behaviors. I predict that when teachers are emotionally supportive, students not only display lower level of disruptive behaviors themselves, but also prefer to make social connections with peers who do not display disruptive behaviors. Students who display disruptive behaviors would be less attractive and appealing as friends in classrooms where teachers provide higher level of emotional support. I also predict that friends' peer influence on disruptive behaviors would be less salient in classrooms where teachers provide higher level of emotional support. Students would be less likely to adopt their friends' disruptive behavior and become more similar over time while students would be more likely to learn and become similar to friends' disruptive behavior in classrooms where teachers do not provide adequate control and needed support.

Overview

In Study 2, I examine how peer selection and influence processes vary across classes, and associated with teachers' emotional support. Peer selection and influence processes on disruptive

behaviors were compared across three types of classes in which teachers' emotional support differed at the beginning of the school year. Based on the observation score of teachers' teaching practices (Classroom Assessment Scoring System; Pianta, La Paro & Hamre, 2008), I differentiated between classes with a low, average, and high emotional support classes. I then investigated whether the development of disruptive behavior and peer selection and influence processes look different in relation to teachers' emotional support in these classrooms.

Specifically, using data from a longitudinal study of early adolescents, I investigated the following questions: (1) *Does students' preference for peers with disruptive behaviors vary by classrooms in relation to teachers' emotional support?* I expect that students displaying disruptive behaviors would be less attractive as friends in high emotional supportive classrooms than low emotional supportive classrooms. (2) *Does friends' influence on students' disruptive behaviors vary across classrooms in relate to teachers' emotional support?* I expect that students in low emotional supportive classrooms are more susceptible to influence from their friends' disruptive behaviors compared to students in high emotional supportive classrooms.

Method

Participants

The participants were fifth grade students from twelve public elementary schools in 27 classrooms (N = 478 at wave 1 and 458 at wave 2) with the average age of 10-11 years. The schools serve non-metropolitan small urban communities. Students stay all day long with the same peer and one dominant teacher in the self-contained classrooms. The sample was about half female (51% at wave 1 and 52% at wave 2) and ethnically diverse (32% African American, 51% European American, 6% Hispanic and 9% other ethnic groups at wave 1 and 31% African American, 51% European American, 4% Hispanic and 9% other ethnic groups at wave 2).

Measures

Friendship Networks. Adolescents' friends within classrooms were measured by asking students to nominate their closest friends, further described to students as "the friends you hang around with and talk to the most". Class roster was provided and students were told to check off names of friends they want to nominate. On average, students nominated 7.78 friends at wave 1, and 8.47 friends at wave 2. Based on the friendship nominations in twenty-seven classrooms, friendship networks were calculated for each classroom. The number of participants in each of the twenty-seven friendship networks ranged from 11 to 27. There were some turn-around in the participants across time so we analyzed the networks including 478 participants present at wave 1 and 458 participants at wave 2.

Disruptive Behavior. Students' disruptive behavior in class was assessed using a measure developed by Kaplan (e.g., Kaplan & Maehr, 1999). Sample items are "I behavior in a way that annoys my teacher" and "I get into trouble in class". All items were rated on a 5-point scale (1 = not at all true of me, 3 = somewhat true and 5 = very true of me). Scale had 4 items and was found to be reliable in our sample (Cronbach's alpha for disruptive behavior = .75 and .82 for waves 1 and 2, respectively). The validity of the disruptive behavior measure has been demonstrated in research finding that the more children report their behavior as disruptive, the more official discipline referrals children received (Kaplan & Maehr, 1999). All items for disruptive behavior were averaged, and then rounded up to the nearest integer to receive the original scale with 5 categories (1 = not at all true, 5 = very true).

Observed Teaching Practices. Teachers' teaching practices in the classroom were observed using the Classroom Assessment Scoring System (Pianta, La Paro & Hamre, 2008). This measure is well established for elementary grades and it has recently been extended to the

secondary grades. A large validation study was done with 250 classes and established reliability, validity and feasibility at the secondary level (Hamre & Pianta, 2010). Two observers visited the classrooms on two days during which they complete a total of four to six 15-minute rating cycles. The observer rates ten dimensions on a 1-7 scale that can be analyzed separately or aggregated into the three broad domains of *emotional support*, *organization and instructional support*. Current study used *emotional support* domain consisting of positive climate, negative climate, sensitivity, and regard for student perspectives dimensions. Scores for each dimension were averaged together to yield one emotional support score.

I created a three-category emotional support level by first calculating the emotional support score then recoding into a Z scores below -.75 as 1, Z scores between -.75 and .75 as 2, and Z scores above .75 as 3. Classes with a low emotional support were identified by a class emotional support Z score below -.75 (Low emotional support; n=9). Classes with emotional support Z scores between -.75 and .75 were considered to have an average emotional support (Average emotional support; n=11). Classes with emotional support Z scores above .75 were classified as having a high emotional support (High emotional support; n=7). Average and standard deviation of emotional support score was 3.09 (.32) for low emotional support classes, 4.37 (.37) for average emotional support classes, and 5.42 (.38) for high emotional support classes.

Analytic Strategy

Analyses were conducted with stochastic actor-based models to estimate the friendship selection and influence processes (SIENA 4.0 R version 2.15.3; Snijders et al., 2012). Missing data due to non-response were handled through the SIENA missing data method (Huisman &

Steglich, 2008), and participants who joined and left friendship network in-between time points were treated using the method proposed by Huisman and Snijders (2003).

The stochastic actor-based models provide estimates on various structural tendencies of the friendship networks as well as network-behavioral dynamics (selection and influence). Estimates on network structural features include density, reciprocity, and transitivity. Estimates on network-behavioral dynamics include *attribute ego* parameter (effect of the nominator's attribute on making friendship nominations), the *attribute alter* parameter (effect of nominee's attribute on receiving nominations), and the *attribute similarity* parameter (tendency for adolescent to nominate friends with similar characteristics, homophilic selection), *behavioral tendency* (overall tendency towards high or low values on a behavioral variable), and *behavioral similarity* (tendencies for actors to adopt the behaviors of their friends). The effects were first analyzed for all classes to examine the general trend, and then analyzed with three separate groups (i.e., low, average, and high emotional support classes) to examine the difference.

Friendship Network Effects. To examine the network structural features, we included basic endogenous network effects: density, reciprocity, and transitivity (transitive triplets) (Veenstra & Steglich, 2012). *Density* describes the tendency of network members (actors) to have friendship ties, measured by the number of friendship choices made in the network. *Reciprocity* describes the tendency for actors to reciprocate a relationship. *Transitivity* describes the tendency for actors to nominate friends of someone's own friend, representing a closed group of three actors who are friends with each other.

Selection Dynamics. To examine selection effects based on teachers' emotional support, we included several selection parameters. The *alter* effect indicates the effects of disruptive behavior, gender, and race on nominations received as friends. Conversely, the ego effects are

the effects of disruptive behavior, gender, and race on nominations given as friends. Inclusion of both effects is necessary to provide more reliable estimates of the extent to which the adolescents formed new friendships with those who were similar in disruptive behavior, gender, and race. Selection of friends with similar disruptive behavior was modeled by a selection similarity effect. This effect indicates whether adolescents with higher disruptive behavior would choose peers as friends who have also higher disruptive behavior. Similarity-based selection for gender and race was also captured with the same gender effect and same race effect.

Influence Dynamics. Peer influence processes were investigated with the *behavioral* similarity parameter. This effect estimated whether adolescents who friends had higher disruptive behavior also develop higher disruptive behavior over time. A positive behavioral similarity effect represents a tendency for adolescents to adopt friends' disruptive behavior and became similar over time (influence). Peer influence processes were estimated while controlling for the *behavioral tendency* (linear and quadratic shape effects) parameter. The *linear shape* parameter modeled the overall tendency toward disruptive behavior. The *quadratic shape* effect modeled the feedback effect of the disruptive behavior on itself, which could be self-correcting (scores being pulled towards the average) or reinforcing (scores being pushed towards the extremes) depending on whether the quadratic shape effects is negative or positive, respectively.

Results

Descriptive Statistics

Table 3.1 provides information on the sample, network characteristics, and measures. Information on these aspects is provided separately for classes with a low, average, and high emotional support. In the first panel of Table 1, we see a nearly equal distribution of boys and

girls, and African American and European American in classes with low, average, and high emotional support classes.

In the second panel of Table 3.1, an initial description of the network structure is provided. Average number of ties and average out-degree (average number of friend nominations) indicates that the number of friendship nominations increased over time. The density indicates that respondents nominated around 40-50% of their classmates as friends over the two waves. The reciprocity parameter shows that respondents reciprocated more than two thirds (70-80%) of the friendship nominations they received from the classmates by also nominating those classmates as friends. Transitivity is the ratio of the numbers of actually by potentially transitive triplets (60-70%), reflecting the tendency of respondents to befriend the friends of friends.

The Third panel of Table 3.1 shows the development of disruptive behavior over time. In low emotional support classrooms, average disruptive behaviors increased from 1.94 to 2.16. (p < .01). In average and high emotional support classrooms, average disruptive behaviors stayed about the same level (1.99 to 2.05 and 1.79 to 1.73, respectively). The last panel of Table 1 also shows the changes of students' disruptive behavior. In low and average emotional support classrooms, students in average level of disruptive behavior decreased and students in high level of disruptive behavior increased. On the other hand, in high emotional support classroom, students in average level of disruptive behavior increased and students in high level of disruptive behavior decreased.

To assess whether assessment of the co-evolution of disruptive behavior and friendship nominations is feasible, we calculated Moran's I (the network autocorrelation coefficient) to assess the degree to which friends display similarity in disruptive behavior (Veenstra & Steglich,

2012). The positive Moran's *I* values in our data show that friends tend to exhibit similarity in academic adjustment attributes. The Jaccard index (fraction of stable friendship nominations among the new, lost, and stable ties between observed data points) indicates the amount of stability and should be more than 0.3 to permit complex selection dynamic modeling in SIENA with adequate statistical power (see Veenstra & Steglich, 2012). The Jaccard index in our networks was 0.44-0.47 so there was sufficient stability and change.

Network Structure, Gender, and Race

The results of the SIENA analyses are presented in separate models in Table 3.2. I first present the results of the analysis in which all 27 classes were included (Model 1). I then present the results for classes with low, average, and high emotional support (Models 2 through 4). Because the results of the network effects were similar in all models, I discuss the network effects based on Model 1.

Density describes the tendency of actors to have outgoing ties (i.e., the degree of dyadic connection in a network). As expected, the density parameter was significantly negative, indicating that adolescents do not tend to nominate just anyone as a friend. Reciprocity describes the tendency for actors to reciprocate a relationship and transitive ties describes tendency for adolescent friendships to form cohesive peer group structures. Both parameters were significantly positive. Positive reciprocity parameter indicates that adolescents prefer to reciprocate friendship nominations and positive transitive ties parameter indicates that adolescents have a tendency to befriend the friends of their own friends, representing these dyadic relationships are embedded within cohesive, triadic (and larger) peer group structures (peer group, cliques). Taken together, the network effects imply that participants had a tendency to reciprocate friendship, keep the friendship networks closed and form peer group structures in

friendship networks, and this tendency did not vary across classes with low, average, and high emotional support.

Friendship Selection for Disruptive Behavior

For disruptive behavior, the alter effect was not significant in any type of classes.

Apparently, students were not attracted to friends based on the level of disruptive behavior.

However, the ego effect was significant in all classes indicating disruptive students nominated more peers as friends. The selection similarity effect was highly significant in all classes (Model 1). However, when the analyses were separated across classrooms with a low, average, and high emotional support classes, we see that the selection similarity effect is marginally significant in classes with low and average emotional support (Model 2 and 3), and significant in classes with high emotional support (Model 4).

Selection dynamics for gender and race were similar across classes. Gender similarity effect was highly significant in all classes (Model 1). When the analyses were separated across classrooms with a low, average, and high emotional support classes, we see that the selection similarity effect is still significant in classes with low and average emotional support (Model 2 and 3), but is not significant in classes with high emotional support (Model 4). Race similarity effect was not significant in all classes (Model 1). When the analyses were separated across classrooms with a low, average, and high emotional support classes, we see that the selection similarity effect is only significant in classes with average emotional support (Model 3).

Friendship Influence for Disruptive Behavior

The linear shape effect was negatively significant in all classes (Model 1) indicating that across the school year students' disruptive behavior was decreasing. However, this trend was not

observed in classes with low emotional support (Model 2), and only observed in classes with average and high emotional support (Model 3, 4).

The peer influence effect was significant in all classes (Model 1). When the analyses were separated across classrooms with a low, average, and high emotional support classes, the influence effect was only significant in classes with low emotional support (Model 2). The peer influence effect was marginally significant in classes with average emotional support (Model 3), and was not significant in classes with high emotional support (Model 4). Following the recommendations of Ripley et al. (2001), I transform and interpret the influence effect as estimated odds. Students were estimated to have 1.6 times the odds of changing their disruptive behavior in all classes (Model 1), and 1.86 times the odds of changing their disruptive behavior in classes with low emotional support (Model 2) in accordance with the average behavior of their friends' than to not change it at all over the school year. These results are in line with our hypothesis that friends' influence on early adolescents' disruptive behaviors is more salient in classrooms where teachers provide lower level of emotional support.

Discussion

Attention to how friends influence students' academic behaviors within the classroom context and in relation to different teaching characteristics and practices is an important avenue for educators to guide students' peer relationships to support their academic adjustment at school. The classroom context is important for the nature of peer relationships that students have with one another. Teachers establish the social and academic climate of the classroom, create norms and shared expectations for how students relate to each other (Battistich & Hom, 1997; Wentzel, 1999). Prior research on peer influence on classroom engagement ignored the fact that peer relationships are nested within classrooms. By examining how peer influence processes

vary by classrooms and are associated with different level of teachers' emotional support, the present study advanced current understanding on friend influence on engagement by making connections between the classroom context and peer relationships. The results indicate that the salience of friends' influence on disruptive behaviors varied between classes and was associated with the level of teachers' emotional support.

Friends' influence on early adolescents' disruptive behaviors was more salient when teachers provide lower level of emotional support in classes. In these classes, adolescents seem to be more affected by friends' disruptive behavior. Early adolescents tend to select friends with similar level of disruptive behaviors and then over time become more similar to their friends. Being friends with students displaying disruptive behaviors lead to increased level of disruptive behaviors of themselves over time. However, this pattern was not found in classes where teachers provide higher level of emotional support. Even though students tend to select friends with similar level of disruptive behaviors, students did not adopt friends' disruptive behaviors and become more similar over time. Teachers' emotional support is likely to impact on peer influence processes of disruptive behaviors by setting the tone of the peer interaction and establishing the academic climate in the classroom (Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Pianta, Steinberg, & Rollins, 1995). When teachers are better aware of students' disruptive behaviors, they might be able to provide cues and adequate control for students' peer interaction around disruptive behaviors (i.e., by influencing classroom seating or assignments; Gest & Rodkin, 2011). Further, when students acknowledge teachers' expectations of engagement, they would not more likely to adopt friends' disruptive behaviors (Chang, 2004; Jonkmann, Trautwein, & Lüdtke, 2009; Sentse, Scholte, Salmivalli, & Voeten, 2007; Stormshak et al., 1999).

Students' preference towards friends displaying disruptive behaviors did not vary across classrooms in relate to the level of teachers' emotional support. Regardless of friends' disruptive behaviors, students chose friends and hang around with in all classrooms. However, overall level of early adolescents' disruptive behaviors declined in classes where teachers provide higher level of emotional support. Declining pattern was not found in classes where teachers provide lower level of emotional support. It may be that students' disruptive behaviors proliferate more when teachers are less able to provide adequate control and support. Further, students are more likely to adopt disruptive behaviors since it is more common and frequent behaviors among friends; thus provide more friends' influence opportunities. This finding is consistent with prior work that has shown teachers' emotional support has significant influence on overall level and changes of students' academic behaviors (Hughes & Kwok, 2007; Meehan et al., 2003; Hughes, Cavell, &Willson, 2001; Hamre & Pianta, 2001). Current findings suggest that teachers provide indirect as well as direct influence on contagion of students' academic behaviors through peer influence processes.

There were several limitations of our research. In our study we focused on class variations of selection and influence effects among friends with 27 classrooms. While we could find variations of teachers' emotional support with this reasonable number of classes, findings should be replicated with larger number of classes. Also, the fact our study was classroom based yielded networks that were too small in size to analyze our SIENA results with meta-analysis which would have enabled us to examine whether classroom network characteristics and selection and influence effects vary by each classroom. Another limitation of our study is that we assessed students' disruptive behaviors based on students' self-report. Future work with more

diverse assessments (e.g., students' peer report, teacher report) could be informative about the influence of friendships on students' school behaviors.

As the chief architects and managers of the classroom context (Cairns and Cairns, 1994; Farmer, Lines, & Hamm, 2011, Kindermann, 2011), teachers are likely to have the power to alter the peer ecology and peer interactions around academic activities. Findings of Study 2 suggest that peer influence processes vary across classes, and are associated with teachers' emotional support. By providing higher level of emotional support, teachers may establish more positive academic context in which disruptive behaviors are less contagious. When teachers aim to relate to students and care for their needs, they would learn better about students' social lives, and can guide students' peer relationships toward better academic adjustment. Findings demonstrate the need to pay attention to the intersection of students' peer influence on academic adjustment.

Chapter 3. References

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Table 3. 1. Description of the Sample, Network Characteristics, and Disruptive Behavior by the level of CLASS (Emotional Support) among 5th Grade

	Low ES Classes		Average ES Classes		High ES Classes		
	W 1	W 2	W 1	W 2	W 1	W 2	
Sample							
Present	161	156	195	186	122	116	
Boys	84 (52%)	83 (53%)	97 (50%)	93 (50%)	62 (51%)	63 (54%)	
African American	88 (55%)	87 (56%)	88 (45%)	81 (44%)	69 (57%)	67 (58%)	
Friendship							
Average Number of Ties	154	164	140	157	157	167	
Average Outdegree	7.85	8.40	7.18	8.28	8.31	8.31 8.74	
Density	0.45	0.48	0.40	0.47	0.47	0.49	
Reciprocity	0.69	0.72	0.67	0.77	0.71	0.78	
Transitivity	0.70	0.73	0.59	0.63	0.64	0.64	
Disruptive Behavior							
Average	1.94	2.16	1.99	2.05	1.79	1.73	
SE	.94	1.02	.98	1.03	.90	.85	
Network autocorrelation							
Moran's I	0.08	0.07	0.03	0.01	0.10	0.05	
Friendship Tie changes							
Average number of Ties dissolved	45.88		37.90		50.57		
Average number of Ties emerged	44.11		36.45		30.85		
Average number of Ties maintained	71.00		72.27		63.71		
Network Changes							
Hamming Distance (change)	90		74.36		81.43		
Jaccard Index (stability)	0.44		0.47		0.44		
Disruptive Behavior Change							
1 (Low)	50 (31%)	50 (32%)	70 (36%)	66 (36%)	57 (47%)	53 (46%)	
2 (Average)	74 (46%)	46 (29%)	67 (35%)	58 (31%)	36 (30%)	39 (34%)	
3-5 (High)	37 (23%)	60 (39%)	56 (29%)	61 (33%)	29 (23%)	21 (18%)	

Table 3. 2. SIENA Estimates of Disruptive Behavior for Selection and Influence Effects among 5th Friendship Networks in All Classes, and Classes with a Low, Average, and High Emotional Support (Wave 1 and Wave 2)

	All Classes Model 1		Low ES Classes Model 2		Average ES Classes Model 3		High ES Classes Model 4	
	Estimate (b)	SE	Estimate (b)	SE	Estimate (b)	SE	Estimate (b)	SE
Network Effect								
Outdegree (density)	-2.02***	0.10	-1.63***	0.17	-1.59***	0.14	-2.20***	0.21
Reciprocity	0.85***	0.04	0.78***	0.07	0.87***	0.07	0.87***	0.10
Transitive ties	1.00***	0.09	0.89***	0.17	0.80***	0.14	1.12***	0.20
Selection Effects								
Sex (F) alter	0.06†	0.04	-0.02	0.07	0.06*	0.03	0.03	0.07
Sex (F) ego	0.04	0.04	0.08	0.08	0.01	0.03	0.21*	0.07
Same sex	0.63***	0.13	0.40**	0.06	0.46***	0.03	0.18	0.24
Race (B) alter	0.01	0.02	0.05	0.05	0.02*	0.01	0.01	0.05
Race (B) ego	-0.04	0.03	-0.10	0.06	0.04***	0.01	-0.05	0.05
Same race	0.04	0.09	0.10	0.10	0.40***	0.03	0.03	0.17
Disruptive behavior alter	-0.02	0.03	-0.03	0.04	-0.03	0.05	0.04	0.08
Disruptive behavior ego	0.17***	0.04	0.14***	0.05	0.15***	0.05	0.34***	0.09
Similarity (selection)	0.52***	0.18	0.31†	0.24	0.41†	0.25	1.17**	0.48
Influence Effects								
Linear shape	-0.20***	0.07	0.03	0.11	-0.26***	0.09	-0.43**	0.21
Quadratic shape	0.06	0.07	0.11	0.13	0.12	0.10	-0.22	0.28
Average similarity (influence)	1.89*	0.97	2.48*	1.50	1.74†	1.48	0.04	2.92

Note. † p < .10, * p < .05, ** p < .01, *** p < .001 (two-tailed tests).

Twenty-seven Classes were included in the analyses; From a total of 27 classes, 9 classes were included as low emotional support (-.75 < z), 11 classes were included as average emotional support (-.75 < z < .75), 7 classes were included as high emotional support (z > .75).

CHAPTER 4

CONCLUSION

Understanding changes of early adolescents' motivation, engagement and achievement, and factors that contribute to those changes has received much attention (Anderman & Maehr, 1994; Eccles, 2004; Pomerantz & Wang, 2009; Simmons & Blyth, 1987). Although growing number of studies indicate that friends and peer groups are an important context where students' academic beliefs and behaviors are socialized (Rodkin & Ryan, 2011), research has not fully explicated the nature of peer associations, and the process of friendship selection and influence due to several important methodological issues (Cillessen, 2009; Kindermann & Gest, 2009; Fabes, Martin, & Hanish, 2009). Using longitudinal social network analyses in all two studies, this dissertation provides additional insights into how friendship networks are organized, how friendship networks impact changes of students' academic beliefs and behaviors, and how classroom contexts are associated with early adolescents' peer network and behavior changes.

In Study 1, I examined the processes of selection and influence in early adolescents' friendship networks in regards to academic motivation, engagement, and achievement. Results indicate that both selection and influence play a role in changes of adolescents' academic beliefs and behavior, but influence effects were more pervasive in explaining similarity amongst friends across the school year. Selection effects were found for academic self-efficacy and G.P.A. Early adolescent students choose friends with similar grades and level of confidence to themselves in the classroom. Influence effects were found for intrinsic value, effortful and disruptive behavior, and G.P.A. Across the school year having friends who like school, try hard and follow the rules, and have good grade facilitate academic values, positive behaviors, and achievement in classrooms. Findings of Study 1 contributed new information about the extent to which selection

and influence occur in relation to academic motivation, engagement, and achievement for early adolescents.

In Study 2, given that students and their peers are nested within classrooms and the context varies greatly between classrooms, I examined how peer selection and influence processes vary by classrooms and are associated with level of teachers' emotional support with a focus on disruptive behaviors. Results indicate that friends' influence on early adolescents' disruptive behaviors were more salient when teachers provide lower level of emotional support in classrooms. Early adolescents select friends with similar level of disruptive behaviors and then adopt friends' disruptive behaviors; thus increased level of disruptive behaviors of themselves over time. However, this pattern was not found in classes where teachers provide higher level of emotional support. Even though students tend to select friends with similar level of disruptive behaviors, students did not adopt friends' disruptive behaviors and become more similar over time when teachers provide higher level of emotional support. Findings of Study 2 suggest that peer influence processes vary across classes, and are associated with teachers' emotional support.

Both of these studies used the longitudinal social network analysis techniques to advance our understanding of early adolescents' academic adjustment. In addition to estimating both selection and influence processes, this analytic technique allowed to estimate and control for structural features of friendship networks. This contributes to knowledge about the nature of early adolescents' friendships in the classroom setting. There was a significant tendency among early adolescents to create reciprocated friendship ties and cohesive transitive ties structures, meaning that early adolescents prefer reciprocated friendships rather than unilateral ones and cohesive peer group structures rather than dyadic structures. Friendship was more likely between students of the same gender and race. Collectively, these results suggest that early adolescents'

friendship networks are characterized by reciprocity, transitivity, and homogeneous tendencies to nominate friends with same gender and race. Importantly, these features were controlled in analyses, ruling out the possibility that changes in structural features of friendships could account for the selection and influence effects on similarity in academic adjustment of early adolescents.

An important direction for future research is to consider multiple contexts of adolescents' peer relationships and incorporate the quality of the friendships. The measure of friendship networks of two studies was limited to students' classrooms. While this is a reasonable choice given that students in elementary school spend most of the day with the students in their classroom, it is still likely to miss some of students' friends that are not in their class (e.g., friends in another class at the school or friends from activities that do not go to their school). Examining friendships in grade level, and extracurricular activities would provide additional insights into the nature of adolescents' peer relations and influence on their academic adjustment. Further, the measure of friend does not attend to the fact that friendships vary in strength and quality. I treated each friendship tie as equivalent in both analyses. Future work that incorporates the duration and quality of friendships would be helpful in understanding the nature and extent of peer influence on academic adjustment.

Another potentially important direction for future research is to consider different types of peer relationships and different facets of classroom contexts. In Study 1 and 2, I focused on selection and influence effects among friends. However, there are many other important social dynamics in classrooms that should be considered to understand the role of peers in academic adjustment. First, students are likely to be influenced by classmates other than friends, too. For example, students may be assigned to different reading or math groups in the class and those peers may not be friends but may be influential for academic adjustment. Or there may be

students that are leaders in the class whose characteristics impact many students in a classroom. Second, social status dynamics that unfold in classrooms such as students' popularity and rejection by peers are related to selection and influence as well as academic engagement and achievement (Buhs, Ladd & Herald, 2006; Logis, Rodkin, Gest & Ahn, 2013). Further, there are other important facets of classroom context that should be considered in addition to the level of teachers' emotional support. For example, teachers vary in how much they encourage mastery and developing their academic competence among students or emphasize competition to motivate students to achieve (Ryan & Patrick, 2001; Wentzel, 2009). Selection and influence of friends does not happen in isolation but amid all of these social dynamics. Theoretical and empirical work that integrates different facets of students' social experiences in classrooms with different academic and social contexts would provide a more comprehensive understanding. This is also likely to important to advance the implications of work in this area for teachers since they must contend with all aspects of peer relationships in the classroom (Farmer et al., 2011).

Conclusion

In conclusion, by taking advantage of recent developments in longitudinal social network analysis this dissertation made several contributions to the literature. Friends play an important role in students' academic adjustment through peer selection and influence processes. While selection is an important process driving similarity between friends in regards to self-efficacy and G.P.A., influence plays a more expansive role in similarity between friends in regards to value, engagement and achievement in the classroom setting. Further, peer selection and influence processes vary across classes, and are associated with teachers' emotional support. By providing higher level of emotional support, teachers establish more positive academic context in which disruptive behaviors are less contagious. Findings of this dissertation demonstrate the

need to pay attention to peer influence processes and the intersection of students' peer interactions and teachers' practices to have more complete understanding of early adolescents' peer relationships on academic adjustment.

Chapter 4. References

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