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Friends Are Resources Too: Examining College-Going Aspiration in the Stable and Newly Established Friendships among Urban and Rural Low Income Students

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Abstract

Drawing from social capital theory, this study examines the extent to which stable versus new friendship patterns affect low income students' educational aspirations in urban and rural high schools. Using whole school sociometric data (744 high school students over a two-year period), this study applies a social influence model to determine the effects of stable and newly established friendships on conformity regarding college-going aspirations. Findings indicate that urban students have more new friends and their educational aspirations increased, conforming to those of their newly established friends. In contrast, rural students have more stable friendships than the urban students and their educational aspirations conformed to those of their stable friends. This work shows that rural students tend not to change their school network size or nominations. However, urban students are more willing to include new students in their school networks which have a positive effect on raising their educational aspirations.

INTRODUCTION

Adolescents' higher education plans are typically shaped within the context of the family and peer group (Coleman 1961). Although family has been shown to be a major factor in determining a student's educational aspirations, researchers also have shown that school peer groups can be particularly effective in molding educational aspirations (Flashman 2014; Carbonaro and Workman 2016). While this existing line of research is informative with respect to schoolwide or classmate friends' influence on adolescent outcomes, what remains unclear is (1) what effect new or longer-term (stable) friends have on adolescents' educational aspirations and (2) whether these patterns are unique to certain locations, such as whether the school was located in a rural or urban area.

We suspected that friendships that lack stability would be less likely to reshape students' college-going orientations. Given that most adolescents expect to attend college, we suspected that students with low aspirations may be the most isolated in their school network; they tend to have fewer school friends, and those who are their friends are likely to share similarly low educational aspirations. In contrast, students with high aspiration are more likely to have high aspiration friends and the broadest social network in high schools, likely aiding the school-wide majority in conforming to the "college for all" message (Rosenbaum 2011, 2001).

Furthermore, we suspected the association between friends' influence and students' academic motivation varied by school location. In rural schools, especially where there is

little residential mobility, we hypothesized that students may stay friends with the same people over time since there is a dwindling number of potential new friends that have not already been accounted for. In urban schools, where there is a high degree of student mobility, we suspected that school networks would be highly unstable; a new friend, potential or actualized, may easily be gone before the semester ends. Using Coleman's terms (1988), these friendship ties would likely be less dense (few in number), less connected (few nominations), and share fewer values (such as educational aspirations). Burt (2005) suggested that individuals receiving less redundant information are more likely to rebel from group conformity. In urban schools with low educational aspirations overall, this may suggest that a student with few friends will be more willing to reject group conformity and aspire to higher education plans. This implication emphasizes Burt's idea that less dense networks and the introduction of new non-redundant information can provide new resources to facilitate individual mobility beyond an existing social circle.

This study aims to understand the influence of stable friends and newly established friends in two school systems and determine if these friendship patterns support changes in college education aspirations. Our work investigates three questions:

Research Question 1: To what extent are the school network friendship configurations stable or new between urban and rural students?

Research Question 2: To what extent do stable or new school network configurations

influence college aspirations for students in rural and urban schools?

Research Question 3: What affect do stable and new school network configurations have on the timing of college enrollment for students in rural and urban schools?

FRIENDSHIP, SCHOOLS, AND COLLEGE-GOING ORIENTATION

Friendship and College-going Orientations

School friends not only provide peer role models for future plans (Perna 2006; Kim and Nunez 2013), but also serve as conduits that share information about how to achieve such plans (Crosnoe and Schneider 2011; Offer and Schneider 2007), especially when students cope with an uncertain future (Schneider et al. 2016). It has been suggested that adolescents reformulate their educational aspirations in response to their prior school achievement and perceived opportunity structure compared to peers in school (Alexander, Bozick, and Entwisle 2008; Andrew and Hauser 2011). Self-reflection, imitation, and adoption take place when students formulate their educational plans to align with expectations with parents, teachers, and school peers (Morgan 1998). Andrew and Hauser's (2011) study also suggests that new information regarding students' academic potential is important for reshaping educational aspirations. While social messages and the self-reflection process may guide students' attitudes, previous research provides limited knowledge about how students associate themselves with desirable peers who have beneficial resources. This study aims to

determine conttexts in which friends influence upward college-going orientations.

Homophily, Stability of Friendship and Upward Mobility

Previous literature on social networks has identified two social processes whereby having school friends affects students' school achievement and educational plans. The first process is termed *homophily*, in which peers share common behaviors, beliefs, and like-minded attitudes (Kandel 1978; Kossinets and Watts 2009; Frank, Muller, and Mueller 2013). The second process is *socialization*, where adolescents tend to mimic, adopt, and learn from the norms of surrounding friends to fit into school life (Kadushin 2011; Friedkin 1998; Crosnoe 2011; Fleshman 2014). For example, hearing a friend talking about his or her college plans may introduce a mimicking type of learning behavior, which allows an adolescent to reformulate his or her own college plans instead of solely adopting a plan from his or her parents.

Prior research concerned with the effect of friends on achievement oriented performance and attitudes has focused primarily on the socialization process (Brechwald and Prinstein 2011; Cook, Deng, and Morgano 2007; Eccles and Roeser 2011; Flashman 2012). For example, Flashman's (2012) study of the National Longitudinal Study of Adolescent Health noted that the probability of nominating high-achieving friends varies by race/ethnicity. High-achieving white adolescents tend to become friends with other high-achieving white

students. Importantly, Flashman found that minority students, particularly high-achieving Black adolescents, tend to have fewer high-achieving friends than high- or lower-achieving white adolescents, resulting in an achievement gap between white and minority students. While this finding supports friends' influence on school achievement through the socialization processes, it also emphasizes that the achievement gap is derived from the disparity in structural opportunities to choose friends in school.

These studies, however, have often viewed the effect of friends' influence as identical for everyone and homogeneous over time. Consequently, little is known about whether different types of friends have distinct influences on adolescents' changes in educational aspirations. In Newcomb's (1961) study of the acquaintance process, changes in students' attitudes are associated with dissolved friendships and the strength of relationships with early and newly established friends (Newcomb 1961). Based on such work and research touting the importance of friends' characteristics (Bowker et al. 2006; Chan and Poulin 2007), we argue that the influence of friendship on adolescents' college-going orientations differs between stable and newly established friends, which may result in a differential socialization process in relation to changes in college-going orientation (Hypothesis 1).

Compared to the broader circle of peers, stable friends represent a "stronger" relationship than acquaintances and those considered "just friends." Research has suggested that the stability of having friends across time is positively associated with school adjustment

and school achievement among adolescents (Bowker et al. 2006; Rude and Herda 2010). Stable friends have been shown to be homogeneous in terms of academic achievement, motivation, and engagement at school (Bowker 2004). However, concentrated homophily and stability in social relations may hinder students' school achievement and motivation, particularly for students in low income families and neighborhoods (Wilson 1987; Ross, Reynolds, and Geis 2000). For example, low income or low aspiration students' choice of friends in their existing social circle can hinder their effectiveness toward upward orientation (Way and Chen 2000); such as students' college plans are often lower than middle income students'.

College-going orientations reflect students' motivation toward upward mobility, especially for low income students. Students' choice of friends and their characteristics are important instrumental resources that promote college-going preparation in high school (Crosnoe, Shannon and Elder 2003; Crosnoe and Schneider 2010). While school friends' resources (e.g., information, support, aspirations) are important, seeking new social resources for upward orientation can violate the norms of existing friendships. Current friendships can define certain rules that include not approaching new friends, with the goal of strengthening the cohesiveness of current friendships (Newcomb and Bagwell 1995). As such, students sometimes need to balance two motivations in formulating their college orientation: choosing friends with distinct characteristics (e.g., high-achieving or high-aspirations) and avoiding the

vulnerabilities associated with potential peers beyond their current friendships (e.g., homophily, security). In response, stepping out of the comparably safe environment of one's social circle can constitute a moral challenge.

The Role of School Location and Newly Established Friends

Schools located in low income neighborhoods structurally reduce students' opportunities, not only because students have a smaller number of stable friends overall, but also because they have fewer friends with beneficial educational resources (Altermatt and Pomerantz 2005; Véronneau and Dishion 2011; Way and Chen 2000). Thus, we expect that urban students not only have fewer stable friends, but also have fewer social resources of college-going orientations derived from their school friends compared to rural students (Hypothesis 2).

However, this may present an opportunity structure if newly established friends (unstable relations) in school provide new information for students in the adoption of new attitudes and plans, such as an achievement orientation (Shin and Ryan 2014), self-regulation (Farley and Kim-Spoon 2014) and college plans (Morgan 2005). Urban students may be able to make better use of the information and resources that new, ambitious peers can provide. Such students may be less concerned about being rejected by current friends and easily adopt new information to redefine their original college-going orientations. Therefore, we expect that the norms of urban students' new friends may outweigh the norms of stable friends in

changing their educational aspirations (Hypothesis 3a) and timing of college enrollment (Hypothesis 3b).

DATA, MEASURE, AND ANALYTIC STRATEGY

Data Sources and Sample

Data were collected from the College Ambition Program (CAP), which serves low income and underrepresented minority students whose families do not have access to the resources or knowledge to help their children get into college. Survey data were collected from a school-wide questionnaire in which the average survey response rate was 76 percent during the 2012-13 school year.

Our samples are based on two high schools – one urban and one rural school in Michigan. The analytic sample from our overall sample includes approximately 299 urban and 213 rural students with valid outcomes, covariates, and friendship nominations. The urban school's 4-year college enrollment is 18 percent (2-year college enrollment is 42 percent), economically diverse (59 percent low income families), and of racially diverse composition (61 percent minority students). The rural school's 4-year college enrollment is 47 percent (2-year college enrollment is 18 percent), moderately diverse in terms of family income (31 percent low income families), and predominantly white (90 percent).[1]

Several steps were used to select the analytic sample in this study. First, we selected 744

(urban=491, rural=253) adolescents who participated and completed surveys during both the 2011-12 school year (Time 1) and the 2012-13 school year (Time 2), including prior college-going orientations as a predictor. This step excluded 9th grade students in Time 2 because there was no prior information available for those students. We then selected 583 adolescents (urban=353, rural=230) whose friends reported valid attributes in terms of college-going orientations, analyzing Time 2 friends' prior college-going orientations as a predictor. This step excluded nearly 138 urban students whose friends with missing attributes in their college-going orientations.[2]

Applying listwise deletion in the inclusion of other covariates (e.g., parental education, prior school achievement, gender, grade, race and ethnicity) resulted in an analytic sample of 512 adolescents (urban=299, rural=213), or 69 percent of the respondents with valid outcomes. We also ran an additional analysis applying a multiple imputation routine for covariates (using Stata Multiple Imputation, results are available upon request), which provided similar results. Therefore, we report current findings using data without multiple imputation.

Friendship data and developmental pattern of friendship compositions

The survey included students from 9th to 12th grade and asked students to "list five best friends." Friendship data only included nominations of peers who attended the same school

and completed the survey. For each possible dyad, we coded the tie as present (1) or absent (0). Networks are directional, meaning a tie from i to j was measured separately from a tie from j to i. We calculated the social norms of friends' influence using friendship nomination data. We identified in-school friends for both the urban and rural school by using the school rosters. 71 percent of urban adolescents named friends (ties=2,674) and 82 percent of the named friends as in-school friends. 91 percent of rural adolescents named friends (ties=1,956) and 94 percent of the named friends as in-school friends.[3] Analytic friendship nominations included 1,137 dyads in urban school and 986 dyads in rural school in Time 2.

To determine whether a friend was stable or newly established, we focused on the Time 2 friendship nomination and tracked whether the dyads were present during Time 1 friendship nomination. When the dyads of friendship were present in both Time 1 and Time 2, we coded the dyad as a *stable friend*. When the dyads of friendship were present only in Time 2, we coded the dyad as a *newly established friend*. With two types of dyadic relationships, Time 2 friendship nomination resulted in three possible compositions. The first composition was the "joint friendship", in which students had both stable and newly established in-school friends at Time 2. The second composition was the "no stable friends", in which students had only new friends at Time 2, with no stable school friends. The third composition was the "stable friends only", in which students have only stable friends and no new friendships at Time 2. The sociograms of students with joint friendship in the urban and rual schools, see Appendix

A.

Figure 1 provides a simple illustration of the potential motivations and friendship compositions for a student who has nominated three school friends. Figure 1 works as a 2-by-2 profile, in which the number of stable and newly established friends reflects different motivations (e.g., security versus effectiveness) in building school friendships over time. For a distribution of potential friendship compositions conditional on the number of friends detailed in the urban and rual schools, see Appendix C.

Control for Selection Process

To account for potential confounders in the selection process of friendship networks, we employed the Latent Space Model (LSM: Hoff, Raftery, and Handcock 2002; Sweet, Thomas, and Junker 2013), which identified individual students' latent position in the process of the Time 2 friendship formation. In particular, LSMs identify each individual's structural position, defined as the likelihood of locating to a potential student taking into account similar personal characteristics (gender, race/ethnicity, grade level, reciprocity and parent education) and shared common friends. For example, if Joe and Tom are both friends with Ted, then the latent position in which Joe and Tom were situated will likely be closer to Ted's latent position. Thus, the latent position in which Joe and Tom were situated will be relatively close to each other compared to other pairs of individuals, since they both have a friendship

with Ted. We include latent position in the social influence model to control for the dependency between friendship selection (selection process) and attitude changes in college-going orientation (influence process) in the Time 2 friendship nomination.

Measures

The outcomes of interest in our analysis are students' educational aspirations and the timing of college enrollment in 2012-2013. *Educational aspirations* were measured by student response to the item "how far in school do you think you'll get?" The scale ranges from 1 (less than high school graduation) to 6 (complete a Ph.D. or other advanced professional degree). *The timing of college enrollment* was measured by student response to the question of "how soon students start college after high school graduation." As previous research has suggested, this measure is crucial to students' success in college completion (Niu and Tienda, 2013). The scale ranged from 1 (I don't know when), 2 (after staying out of school for over one year), 3 (after staying out of school for one year), and 4 (right after high school)." A higher value indicated students' higher motivation to continue a college education right after high school.

The main independent variables of interest were *norms of stable and new friends' educational aspirations and timing of college enrollment*. To capture the influence of stable and new friends' educational aspirations on adolescent changes in college-going orientation, we used the Social Influence Model with the social capital perspective (Friedkin 1998;

Friedkin and Cook 1990; Lin 2000; Frank and Fahrbach 1999). We defined a social norm as a function of friendship nomination and potential resources available through stable and newly established friends. For example, considering that Ted had nominated Joe and Tom as stable friends. Given that Joe has a prior educational aspiration of obtaining a college degree (value=4) and Tom has a prior educational aspiration of completing some college (value=3), then stable friends' norms of educational aspirations for Ted (via Joe and Tom) were (4+3)/2 = 3.5. A similar equation was used for calculating the norms of stable and newly established friends' timing of college enrollment.

$$\text{Social norms of stable friends' educational aspirations}_{i} = \sum_{\substack{i'=1 \\ i' \neq 1}}^{n_i} (\text{stable friend}_{ii'} \text{ at Time 2}) \times (\text{Stable friends' Time 1 educational aspiration}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where n_i represents the number of stable friends i (e.g., Joe, Tom) in Time 2 with prior educational aspirations (e.g. k=0, 1, 2, 3, 4, 5) and ii' represents an individual student i reported as a group of stable friends i' (e.g., Joe, Tom and Janet) that they interacted in the past year. This study takes the average of all stable friends' Time 1 aspirations to represent the influence of stable friends in the past year on educational aspirations. The same procedure was applied to calculate the social norms of newly established friends at Time 2.

The other independent variables were: highest level of parental education, students' prior school achievement, grade level, sex, race and ethnicity. Parental education was coded as three dummy variables (with less than high school as the reference group).[4] We used 8th grade standardized test scores in math to represent students' prior school achievement. In the urban school, this variable was missing more than 50 percent of cases; therefore, we substituted school GPA for urban students obtained at school year 2011-2012. Sex was coded

as a dummy variable (male =1). Race and ethnicity was coded as five categories (with white as the reference group).[5] We also controlled for the grade the student was enrolled in during the 2012-13 school year (using 10th grade as the reference group).

Analytic strategy

The social influence model consisted of three steps. The first step of the analysis was to generate latent space position using students' friendship nomination at Time 2.[6] There were 89,102 possible directed friendship ties in the urban school and 45,156 possible directed friendship ties in the rural school.[7] Both schools in the latent space model showed significant homophily effect with respect to students' gender, race/ ethnicity, grade level, reciprocity and parent with some and beyond college degree.[8]

The second step of the analysis was to generate the norms of stable friends and new friends' college-going orientations (see Equation (1)). The third step of the analysis was to estimate the social influence model with students' prior college-going orientations, latent positions and a set of covariates. This social influence model examined the degree to which the norms of stable and new friends' college-going orientations predict changes in adolescents' college-going orientations in 2012-2013. We performed the models separately by friendship compositions and schools. The equation for the social influence model can be described as:

$$Y_i(College\ orientation)_{t2} = \beta_0 + \beta_1(Prior\ College\ orientation)_{t1}$$
$$+\beta_2(Norms\ of\ stable\ friends'_{t2}\ college\ orientation_{t1})$$
$$+\beta_3(Norms\ of\ new\ friends'_{t2}\ college\ orientation_{t1})$$
$$+\beta_4(Grade\ 11)_{t2}$$
$$+\beta_5(Grade\ 12)_{t2}$$
$$+\beta_{6-9}(Race/Ethnicity: Black, Hispanic, Asian\ and\ others)_{t2}$$
$$+\beta_{10}(Male)_{t2}$$
$$+\beta_{11-13}(Parent\ education: High\ school, some\ college, college\ graduated)_{t2}$$
$$+\beta_{14}(Grade\ 8\ math\ test\ or\ 2011-2012\ GPA)_{t2}$$
$$+\beta_{15-16}(Coordinates\ of\ latent\ space\ position)_{t2} + e$$

RESULTS

Friendship Nomination, Stable and Newly Established Friends

The descriptive statistics for urban and rural schools were summarized in Table 1. The proportion of urban students who reported one and two friends significantly increased over time, while the percentage of urban students reporting five friends remained stable. In the rural school, 71 percent of students reported they had five in-school friends at Time 1 and remained constant at Time 2. Table 1 also compares urban and rural students; urban students with no friends in Time 1 was significantly higher than rural students. The distribution of Time 1 friendship nomination in urban school did not greatly differ from rural school aside from a much lower proportion of having five friends compared to its counterpart. In addition, the proportion of urban students who nominated one to four friends at Time 2 was higher than rural students except for students with five friends. Urban students with five friends remained relatively lower compared to rural students.

Within a time interval of two years, 41 percent of urban students nominated no stable in-school friends, while only 27 percent of rural students reported no stable friends in school. The proportion of urban students with no stable friends is significant higher than rural students ($z=3.26$, $p<.01$). The proportion of rural students who reported having two stable friends was significantly higher than urban students. Descriptive results suggest that rural students were more likely to have in-school stable friends than urban students.

The distribution of the three possible friendship compositions for urban students was as follows. For urban students, 54 percent had a joint friendship, 41 percent had no stable friends, and approximately 5 percent had only stable friends. For rural students, nearly 71 percent had a joint friendship, 27 percent had no stable friends, and only 1 percent reported having only stable friends. Comparing the distribution between urban and rural schools, results suggest that the proportion of rural students with joint friendship was significantly higher than for urban students ($z=-4.01$, $p<.001$). In contrast, the proportion of urban students that had no stable friends was higher than for rural students ($z=3.26$, $p<.01$). Only a small number of students reported having only stable school friends at Time 2 (N=14 in urban school; N=3 in rural school). Therefore, we excluded those cases in the following analyses.

In terms of other social demographic statistics, the urban school had more minority students and more than half reported parents with no college education. More than half of rural students had college educated parents, and most students were white.

The descriptive statistics for college-going orientations for students and their friends were reported in Table 2. As expected, the norms of stable friends' educational aspirations for urban students were significantly lower than rural students ($p<.01$). However, college-going norms of urban students' newly established friends were higher than for rural students ($p<.000$). We also found that urban students were exposed to higher norms of new friends' timing of college enrollment ($p<.01$) compared to rural students. In short, higher norms of

new friends' college-going orientations were observed in urban students compared to rural students. Higher norms of stable friends were only observed in rural students' educational aspirations compared to urban students. Importantly, the norms of stable friends were significantly higher than the norms of new friends within each school, and this tendency was consistent for both urban and rural schools across college-going orientations except for urban students' timing of college enrollment.

Students and Friends' College Orientation in Two Compositions: Joint Friendship and No-Stable-Friends

Students and their friends' educational aspirations in the joint friendship and no-stable-friends composition were reported in Table 3A. Urban students with joint friendships reported higher Time-2 educational aspirations (M=4.65, SD=0.90; M=4.37, SD=0.90, $p<.01$) and Time-1 educational aspirations (M=4.67, SD=0.99; M=4.35, SD=0.99, $p<.01$) than their peers who had no stable school friends. On the contrary, rural students with joint friendships reported similar level of educational aspirations as their peers who had no stable friends in school. With respect to whether new friends' educational aspirations differed by composition, we found no evidence for any difference in new friends' educational aspirations between two compositions. This pattern was consistent in both schools. In short, the difference in educational aspirations between friendship compositions was only observed

in urban students' own characteristics instead of their friends' characteristics. This effect indicated that urban students' educational aspirations played a role in the formation of their friendship compositions.

Next, we also examined the difference between individuals and their friends' educational aspirations, compared the urban and rural school in Table 3A. In contrast to our expectations, we found that urban students with joint friendships reported significantly higher Time 2 educational aspirations than rural students (M=4.65, SD=0.90; M=4.44, SD=0.91, $p<.05$). However, as expected, the aspirations of urban students' stable friends (M=4.09) were significantly lower than for rural students (M=4.47). Only urban students' new friends' educational aspirations were higher than for rural students (M=3.82, SD=1.41; M=3.26, SD=1.46, $p<.001$). Results indicated that norms of new friends' educational aspirations were consistently higher for urban students compared to rural students, regardless of friendship compositions. Rural students, on the other hand, were exposed to higher norms of stable friends' educational aspirations compared to urban students. This pattern showed that a distinct grouping behavior existed between urban and rural students, which resulted in differentiated access to social resources by types of friends.

Examining students and their friends' timing of college enrollment in the two friendship compositions within school was reported in Table 3B. We found that urban students with joint friendships also reported a higher intention to enroll in college right after graduation at

Time 1 (M=3.72, SD=0.78; M=3.36, SD=1.09, p<.01) than their peers who had no stable school friends. This effect indicates that urban students' prior timing of college enrollment also played a role in the formation of friendship compositions. Examination of stable and new friends' timing of college enrollment in the urban and rural school also suggested a similar pattern, as the aforementioned results were related to higher norms of new friends for urban students and higher norms of stable friends for rural students.

Overall, urban students with joint friendships had higher aspirations and timing of college enrollment than urban peers who had no stable friends in school. Rural students, on the contrary, had similar college-going orientations as their peers regardless of friendship compositions. Importantly, the differences in structural opportunities between urban and rural students were determined by differences in friendship networking behaviors. The advantage of urban students in college-going orientations are derived from newly established friendships and their own college-going orientations. In contrast, rural students possessed more stable friendships; differences between urban and rural students in college-going orientation were derived from their stable friends' initial orientations.

Normative Influence Model in Joint Friendship Composition

In order to confirm what types of friends' norms adolescents were more likely to conform to in relation to their Time-2 college-going orientations, we simultaneously

estimated two normative effects for students in the joint friendships in Table 4. Model 1A estimated the influence of stable friends and new friends on urban students educational aspirations. Urban students were more likely to conform to new friends' aspirations (b=.10, p<.05) in changing their educational aspirations. Results showed that an increase of one unit in new friends' educational aspirations was related to an increase of 0.10 points in urban students' educational aspirations.[9] Although the same effect for timing of college enrollment was in the expected direction, it did not attain statistical significance for urban students (b=.04, p>.05) in Model 1B, suggesting a limited effect of new friends' norms in changing urban students' timing of college enrollment. This result was not surprising, as most who graduate do attend college immediately after high school graduation the following fall.

As expected, rural students were more likely to conform to stable friends' norms in changing their aspirations (b=.16, p<.05) in Model 2A and timing of college enrollment (b=.15, p<.05) in Model 2B, suggesting the norms of stable friends rather than the norms of new friends, played an important role in changing rural adolescents' college-going orientations. Our results suggested that when comparing students who had joint friendships in school, urban students were more responsive to new friends' norms in changing their educational aspirations. Rural students, in contrast, were more responsive to stable friends' norms in changing their college-going orientations both in terms of educational aspirations and timing of college enrollment.[10] Of the factors associated with college-going orientations,

our findings suggest that school GPA and parental education still play roles in determining urban students' upward orientations, holding constant prior college-going orientations and friends' college-going orientations.

DISCUSSION AND CONCLUSION

The goal of this study is to examine what normative effects in friendship drive adolescents' changes in educational aspirations and college plans. We are particularly interested in the degree to which the norms of stable friends versus newly established friends are associated with changes in adolescents' college-going orientations. Using longitudinal data, we examine the relationship among types of friends, friends' characteristics, and students' college-going orientation. We find a positive effect of stable friends' norms on rural students' changes in educational aspirations and timing of college enrollment (Hypothesis 1) and a positive effect of newly established friends' norms on urban students' changes in educational aspirations (Hypothesis 3a). We suggest that urban students have fewer stable friends and a relatively lower level of stable friends' educational aspirations compared to rural students (Hypothesis 2). We also find that students with a joint friendship have higher college-going orientations compared to those with no stable friends or only stable friends. This is particularly evident in the urban school.

We find that stable friends who have higher norms for college-going orientation have a positive impact on rural students' college-going orientation, which is consistent with evidence from research on the closure networks (Coleman 1988; Lin 2000) and social psychological research (Chan and Poulin 2007; Poulin and Chan 2010). Yet the norms of stable friends' college-going orientation have no impact on urban students' changes in college-going orientation. With respect to urban students' timing of college enrollment, neither stable friends nor new friends influence their changes in timing of college enrollment. Furthermore, we find that only newly established friends' educational aspirations have a positive impact on urban students.

While conforming to the norms of newly established friends is associated with increases in urban students' aspirations, we are not suggesting that new friends are solely responsible for the increase. We emphasize that newly established friends may provide another source of social norms or potential information for urban students to refine their orientations toward higher education. Therefore, newly established friendships and their characteristics are essential for urban students in refining college plans.

We highlight several features of in school friendship compositions that may provide opportunities for students to access and seek more socio-cultural resources in relation to their college-going orientation. Our findings suggest that the majority of rural students have at least one stable friend in school, while 41 percent of urban students have no stable friends in

school. Furthermore, urban students who develop a "joint friendship" have higher prior college-going orientations than rural students, and rural students who develop a "joint friendship" have more stable friends who are carrying higher initial college-going orientations compared to urban peers.

However, the findings of the limited influence of urban students' stable friends on college-going orientation should not be considered evidence that the norms of stable friends are unimportant in urban schools, because this may result from the presence of fewer stable friends in the urabn school. In an urban school, there is a stronger tendency for students to become friends with out-of-school friends or neighborhood friends than in a rural school (Way 1998). This tendency has been increasingly observed, especially among those living in low income urban neighborhoods (Osgood and Anderson 2004; Silver and Miller 2004). In other words, school location or concentrated poverty vastly increases the likelihood that adolescents will establish friendships with street-oriented peers instead of school-oriented peers. If some school-based programs or policies could increase students' chances to stabilize social relations in school, students could still remain connected with school and reduce their likelihood of having out-of-school friends. What we emphazise is that the role of stable friends in changing adolescents' college-going orientation should not be underestimated regarding neighborhood and school location as a whole.

This finding also echoes previous psychological research (Poulin and Chan 2010) and urban research (Witkow and Fuligni 2010; Leventhal and Brooks-Gunn 2000; Harding 2011) that lower social control and social capital for urban students is derived from the lack of stability in social relations with school-oriented friends, activities and values. The consequences of these undersupportive high school experiences tend to increase students' decisions to drop out of school, enroll in college when underprepared or pursue postsecondary paths that do not improve their skills (Schneider et al. 2016). While urban students may access higher norms of new friends' college-going orientations than rural students, the level of norms are consistently lower than the norms of their stable friends. This indicates that stable social relations tend to restore more social resources than unstable relations in school friendships.

The present study has several limitations. First, our name generator measure of friendship nomination is limited to five friends in school, rendering us unable to analyze the entire friendship network of students. It takes a social network methodology innovation to clarify the potential impact of five nominations on the influence of friendship. More fundamentally, we limit friendship data for adolescents who named friends that can be identified on the school rosters. One sixth of urban students excluded in the analyses because they did not name any friends in school.[11] Although we have offered a rationale and previous literature highlighting the tendency for urban students to become friends with out-of-school

friends or neighborhood friends, the exclusion of these students may underestimate the impact of friends in changing students' college-going motivation.

Second, we are limited to two measures of college-going orientation in the CAP data set. We lack subtle measures of college-going motivation, attitude, and knowledge that would support a more in-depth assessment of college-going orientation. Furthermore, our measures of college-going orientations may be subject to self-report bias, which may only reflect students' real orientation when they fully understand the survey questions.

Third, there are some differences in the methodology of this study compared with other studies that have investigated the influence of friendship and their characteristics. Other studies focus on the broader school context and differentiate between the normative influences of best friends, reciprocal friends (Wentzel, Barry, and Caldwell 2004), intermediate friends (Carbonaro and Workman 2016), the stability of friendship (Chan and Poulin 2007) and friendship evolutions (Fleshman 2014). For example, Carbonaro and Workman (2016) investigate college-going aspirations in the context of direct friends and the friends of students' friends using the social influence model. We use a similar model but distinguish between normative influences of stable friends and new friends on students' college-going aspirations. We identify that rural students are more responsive to the norms of stable friends, while urban students are more responsive to the norms of newly established friends in changing their educational aspirations. Our study also complements that of

Carbonaro and Workman in that we control for prior college-going orientation and the potential confounder of network homophily (latent position) in predicting changes in college-going orientation. Although we do not account for the effect of transitivity on students' changes in attitude, we control for the tendency of homophily in the context of the social influence process. Future research should address the effect of the network structure in the social influence process via more appropriate multi-network modeling or exponential random graph (ERGMs) models.

The inequality of structural opportunities between urban and rural students derives from the lack of stable friends in urban school and their friends' characteristics of upward mobility. Following this argument, we may conclude that the most disadvantaged urban students are those that have no stable in-school friends, choose to hang out with low-aspiration or street-oriented friends, and nominate fewer peers as friends. Such at-risk youth, in our case, could be identified using sociometric assessment, and their motivation could be refined by applying a school-based intervention program that aims to support students to prepare for college. Overall, our findings indicate evidence that urban and rural students rely on distinct types of social relations to access social capital and social resources in changing their orientations for upward mobility.

FUNDING

NOTES

1. Data sources of high school characteristics and college enrollment rates come from Common Core of Data in school year of 2012-2013.
2. There were nearly 28 percent (491-353=138) of urban students whose friends with missing attributes, such as Time 1 educational expectation and Time 1 timing of college enrollment.
3. For the urban school, approximately 18 percent of nominations plausibly match partial names on the roster and thus could not be identified as a complete dyadic relationship, and 0.5 percent of nominations are out-of-school friends or school teachers. For the rural school, approximately 6 percent of nominations plausibly match partial names on the rosters and 0.4 percent of nominations are out-of-school friends or school teachers.
4. We combine both mother's and father's education to generate the highest level of parental education. Four categories follow the order below: (1) Less than a high school diploma (2) High school graduate (3) Some college (4) Completed 4 years of college or more. We use three dummy variables to capture the effect of parental education.
5. We categorize students' racial backgrounds into five groups: (1) non-Hispanic white; (2) Black; (3) Hispanic; (4) Asian/Pacific-Islander; and (5) others (including multi-racial). The Hispanic category includes all students of Hispanic origin, regardless of whether they report being multi-racial or white.
6. Latent Space Model (Hoff, Raftery, & Handcock, 2002) is used to model the likelihood of a friendship tie as a function of dyadic similarity and latent space positions. The LSMs model assumes each student in the friendship network occupies a position in a latent social space. For example, students who are far apart in this social space are less likely to

form a friendship tie between them.

7. Friendship networks consist of students who nominated other students as best friends. We identify friends as stable versus newly established friendship using two years of friendship nomination. Network size varies by schools. Urban network includes 299 students and 1,137 friendship dyads. Rural network includes 213 students and 986 friendship dyads. The crosstable between the number of stable friends and the number of new friends detailed in the urban and rual schools, see Appendix B.
8. The school-specific findings of latent space model were available upon request.
9. To further examine urban students' changes in educational aspirations as positive increases in conforming to those of their newly established friends, we also run social influence models using the gain scores of educational aspirations as the outcome. We found that an increase of one unit in new friends' educational aspirations is associated with an increase of 0.09 points in urban students' Time 2 educational aspirations.
10. We also examine the normative effect of new friends for students who have no stable friends in school. We find that only urban students are slightly responsive to the norms of their new friends' aspirations (b=.202, p<.1). We find no evidence that rural students respond to the norms of their new friends (all ps > .05).
11. 71 percent of urban adolescents named friends (ties=2,674) in school year 2012-2013.

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Table1: Descriptive Statistics among Urban and Rural School

	Urban			Rural			z-test
	Freq.	%	Paired T-test	Freq.	%	Paired T-test	
Number of Time-1-Friends							
0 friend	41	15.02 [a]		4	1.89		**
1 friend	12	4.40 [a]		7	3.30		
2 friends	14	5.13 [a]		5	2.36 [a]		
3 friends	21	7.69		11	5.19		
4 friends	46	16.85		36	16.98		
5 friends	139	50.92		150	70.75		***
Number of Time-2-Friends							
0 friend	0	0.00		0	0.00		
1 friend	23	7.69		5	2.35		*
2 friends	31	10.37		11	5.16		*
3 friends	30	10.03		12	5.63		
4 friends	68	22.74		33	15.49		*
5 friends	147	49.16		152	71.36		***
Number of Stable Friends at Time-2							
0 stable friend	123	41.14		58	27.23		*
1 stable friend	70	23.41		63	29.58		
2 stable friends	47	15.72		54	25.35		*
3 stable friends	45	15.05		30	14.08		
4 stable friends	14	4.68		7	3.29		
5 stable friends	0	0.00		1	0.47		
Number of New Friends at Time-2							
0 new friend	14	4.68		3	1.41		*
1 new friend	51	17.06		21	9.86		*
2 new friends	67	22.41		46	21.60		
3 new friends	65	21.74		51	23.94		
4 new friends	50	16.72		60	28.17		**
5 new friends	52	17.39		32	15.02		
Friendship Developmental Compositions							
Joint friendship	162	54.18		152	71.36		***
No stable friends	123	41.14		58	27.23		**
Only stable friends	14	4.68		3	1.41		*
Grade level							
Grade12	89	30.16		56	27.72		
Grade11	103	34.92		67	33.17		
Grade10	103	34.92		79	39.11		
Demographic							
Male	134	44.82		109	46.98		
Female	165	55.18		123	53.02		
White	103	34.45		198	88.36		***
Black	82	27.42		0			
Asian	45	15.05		3	3.02		***
Non-white hispanic	66	22.07		9	6.03		***
Other/Multi-racial	3	1.00		2	0.86		
Parent less than high school	68	22.74		22	10.37		**

Parent high school degree	82	27.42	41	19.34	*
Parent some college	67	22.41	73	34.43	**
Parent college and beyond	82	27.42	76	35.84	*
Total N		299		213	

Note1: Z-statistics were based on two-tailed test. *** p<.001 ** p<.01 * p<.05;
Note2: For the urban school, we also have a few Native American and Pacific Islander American students (less than 10), so we excluded those cases in the analytic sample.
[a] indicates the significant difference between the number of Time-1-Friends and the number of Time-2-Friends within school, Paired T-test (p<.05).

Table 2: Descriptive Statistics of College Orientation for Students and Their Friends' College Orientation by Schools

	Urban		Rural	
	Mean	SD	Mean	SD
Educational Aspirations				
Time 2 Educational Aspirations	4.56	0.90	4.60	0.88
Time 1 Educational Aspirations	4.53	0.99	4.50	0.86
Norms of Stable Friends' Educational Aspirations	4.08[a]	1.39	4.45[a]	0.82 **
Norms of New Friends' Educational Aspirations	3.75[a]	1.28	3.27[a]	1.35 ***
Timing of College Enrollment				
Time 2 Timing of College Enrollment	3.62	0.86	3.65	0.82
Time 1 Timing of College Enrollment	3.56	0.96	3.54	0.91
Norms of Stable Friends' Timing of College Enrollment	3.21	1.24	3.42[a]	0.99
Norms of New Friends' Timing of College Enrollment	2.94	1.15	2.55[a]	1.11 **

Note: The calculation of normative influence is based on equation (1) and we used the time-lag effect. For example, the norm of stable friends' education aspirations was determined by average of Time-2 stable friends' prior educational aspirations. [a] indicates the significant difference between the norms of stable friends and the norms of new friends. Paired T-test ($p<.05$).
Two sample T-test, two tailed test *** $p<.001$ ** $p<.01$ * $p<.05$

Table 3A: The Mean and SD of Students and Their Friends' Educational Aspirations by Schools and Friendship Compositions

Educational Aspirations	Urban (n=160)			Rural (n=155)			T-test Urban & Rural
Composition: **Joint friendship**	Mean	SD	Pair-test	Mean	SD	Pair-test	
Time 2 Educational Aspirations	4.65	0.90	2.84 (df=290)	4.44	0.91	1.22 (df=207)	*
Time 1 Educational Aspirations	4.67	0.99	2.99 (df=290)	4.55	0.86	1.70 (df=207)	
Norm of Stable Friends' Educational Aspirations	**4.09**	**1.41**		**4.47**	**0.80**		**
Norm of New Friends' Educational Aspirations	**3.82**	**1.41**	1.07 (df=290)	**3.26**	**1.46**	0.96 (df=207)	**
Composition: **No Stable Friends**	Urban (n=132)			Rural (n=54)			
Time 2 Educational Aspirations	4.37	0.90		4.28	0.79		
Time 1 Educational Aspirations	4.35	0.99		4.33	0.87		
Norm of New Friends' Educational Aspirations	3.66	1.11		3.28	0.95		*

Note: Paired T-test examines the statistical difference between two friendship compositions within the same school (* p<.05).
Two sample T-test between urban and rural school, two tailed test *** p<.001 ** p<.01 * p<.05
Results in bold indicate a significant difference between the norms of stable friends and the norms of new friends. Paired T-test (p<.05).

Table 3B: The Mean and SD of Students and Their Friends' Timing of College Enrollment by Schools and Friendship Compositions

Timing of College Enrollment	Urban (n=160)			Rural (n=155)			T-test Urban & Rural
Composition: **Joint friendship**	Mean	SD	Pair-test	Mean	SD	Pair-test	
Time 2 Timing of College Enrollment	3.63	0.88	0.16 (df=288)	3.68	0.77	1.33 (df=207)	
Time 1 Timing of College Enrollment	3.72	0.78	3.52 (df=288)	3.59	0.87	1.53 (df=207)	
Norm of Stable Friends' Timing of College Enrollment	3.12	1.24		**3.38**	**0.99**		*
Norm of New Friends' Timing of College Enrollment	2.94	1.23	0.00 (df=288)	**2.57**	**1.19**	0.40 (df=207)	**
Composition: **No Stable Friends**	Urban (n=132)			Rural (n=54)			
Time 2 Timing of College Enrollment	3.62	0.82		3.52	0.96		
Time 1 Timing of College Enrollment	3.36	1.09		3.38	1.02		
Norm of New Friends' Timing of College Enrollment	2.94	1.05		2.50	0.83		**

Note: Paired T-test examines the statistical difference between two friendship compositions within the same school (* p<.05).
Two sample T-test between urban and rural school, two tailed test *** p<.001 ** p<.01 * p<.05
Results in bold indicate a significant difference between the norms of stable friends and the norms of new friends. Paired T-test (p<.05).

Table 4: Two Normative Efffects Predicting the Educational Aspirations and Timing of College Enrollment in 2012-2013 among Students with Joint Friendship

	Urban	Urban	Rural	Rural
	Aspirations	Timing of college enrollment	Aspirations	Timing of college enrollment
	Model 1A	Model 1B	Model 2A	Model 2B
Intercept	2.051***	1.652***	1.121*	2.366***
	(0.441)	(0.352)	(0.436)	(0.407)
Educational aspirations at Time 1	0.408***		0.583***	
	(0.069)		(0.067)	
Timing of college enrollment at Time 1		0.539***		0.217**
		(0.087)		(0.073)
Friends' Normative Effects				
Norms of stable-friends' educational aspirations	0.069		0.157*	
	(0.051)		(0.075)	
Norms of new-friends' educational aspirations	0.098*		-0.040	
	(0.043)		(0.043)	
Norms of stable-friends' timing of college enrollment		-0.017		0.151*
		(0.057)		(0.065)
Norms of new-friends' timing of college enrollment		0.042		0.012
		(0.059)		(0.054)
School achievement				
Grade 8 math score for rural school	0.183+	0.178+	0.105	0.086
/ GPA for urban school	(0.102)	(0.098)	(0.157)	(0.089)
Socio-economic status				
Parent education: High School	0.078	0.070	0.170	-0.183
(Ref. No HS degree)	(0.155)	(0.200)	(0.191)	(0.255)
Parent education: Some college	0.316+	0.080	0.051	-0.249
	(0.163)	(0.213)	(0.183)	(0.222)
Parent education: college degree	0.401*	0.131	0.218	-0.095
	(0.175)	(0.197)	(0.172)	(0.222)
Demographics				
Male	-0.036	-0.187+	0.042	-0.053
	(0.156)	(0.102)	(0.105)	(0.076)
Black (Ref. White)	0.137	-0.269	--	--
	(0.187)	(0.177)	--	--
Asian	-0.106	-0.117	0.024	-0.231
	(0.221)	(0.217)	(0.403)	(0.462)
Hispanic	-0.035	-0.084	-0.472+	-0.346
	(0.189)	(0.180)	(0.284)	(0.285)
Grade 11 (Ref. Grade 10)	-0.140	-0.313+	-0.038	0.145
	(0.183)	(0.181)	(0.143)	(0.146)
Grade 12	0.060	-0.021	0.228	0.463**
	(0.188)	(0.179)	(0.166)	(0.167)
Adjusted R-square	0.226	0.214	0.365	0.237

*** p<.001 ** p<.01 * p<.05 †p < .10; Standard errors in parentheses.

Note: Sample selected for those with joint friendship. All models included latent position, grade level, male, race/ethnicity , parent education, eight grade math score. Urban students= 160, rural students=151.

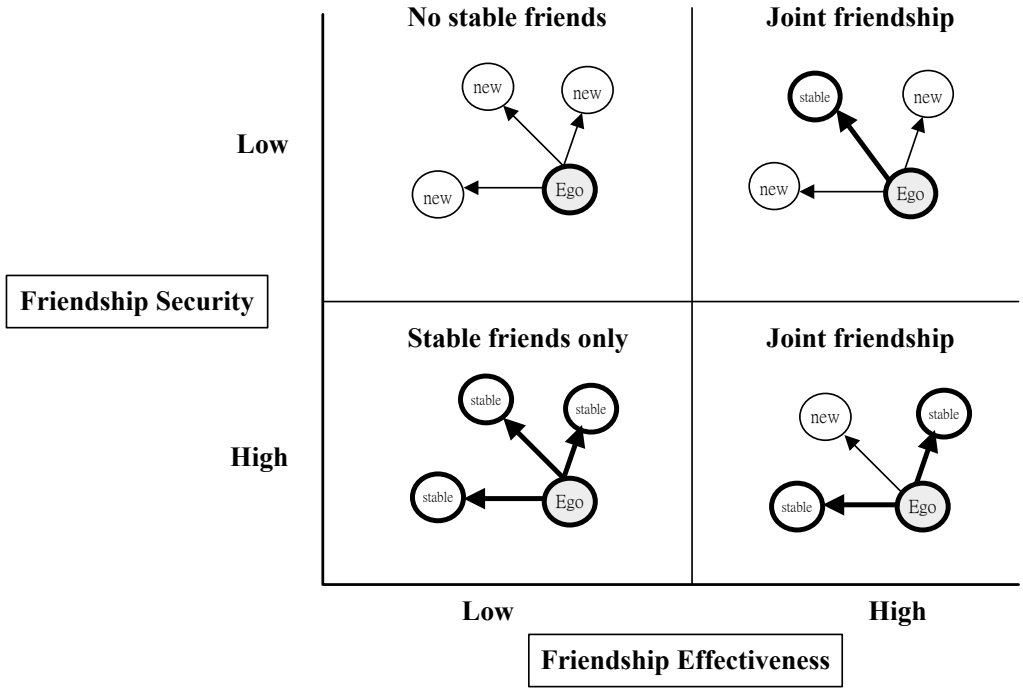

Figure 1. The Potential Friendship Motivations and Compositions for a Student Who Nominated Three Friends in School

Appendix A: Sociogram for Students with Joint Friendship in the Urban School and Rural School

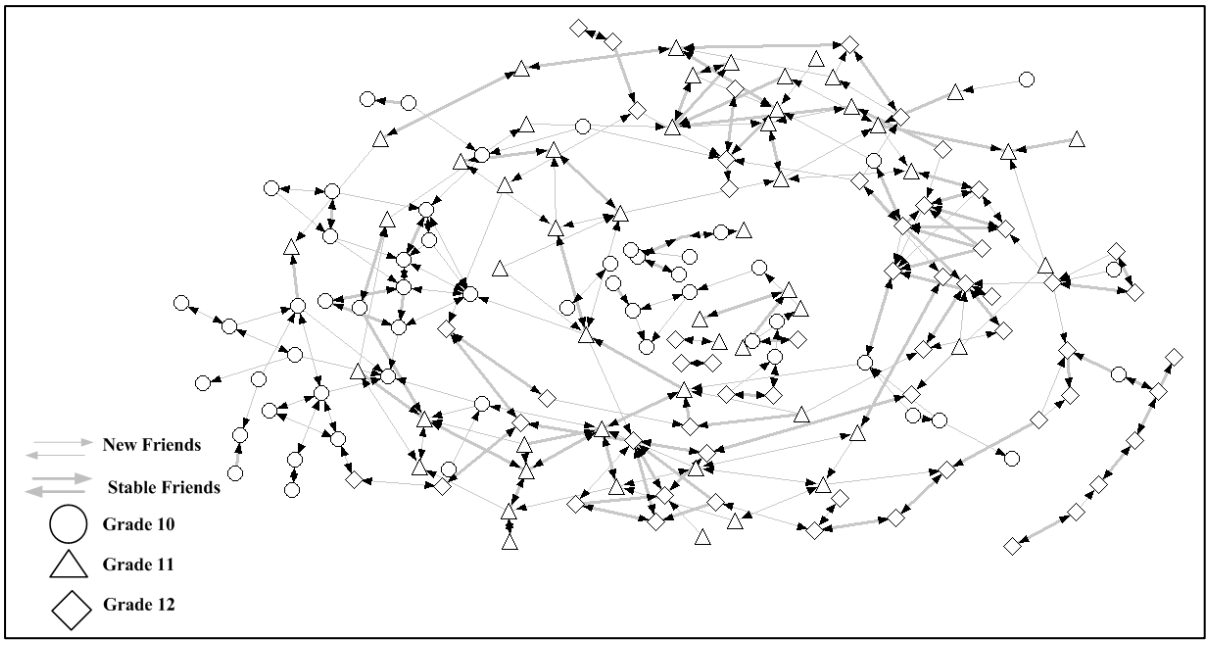

Figure 2. 2012-2013 Urban Stable and New Friendship Network (N=160)

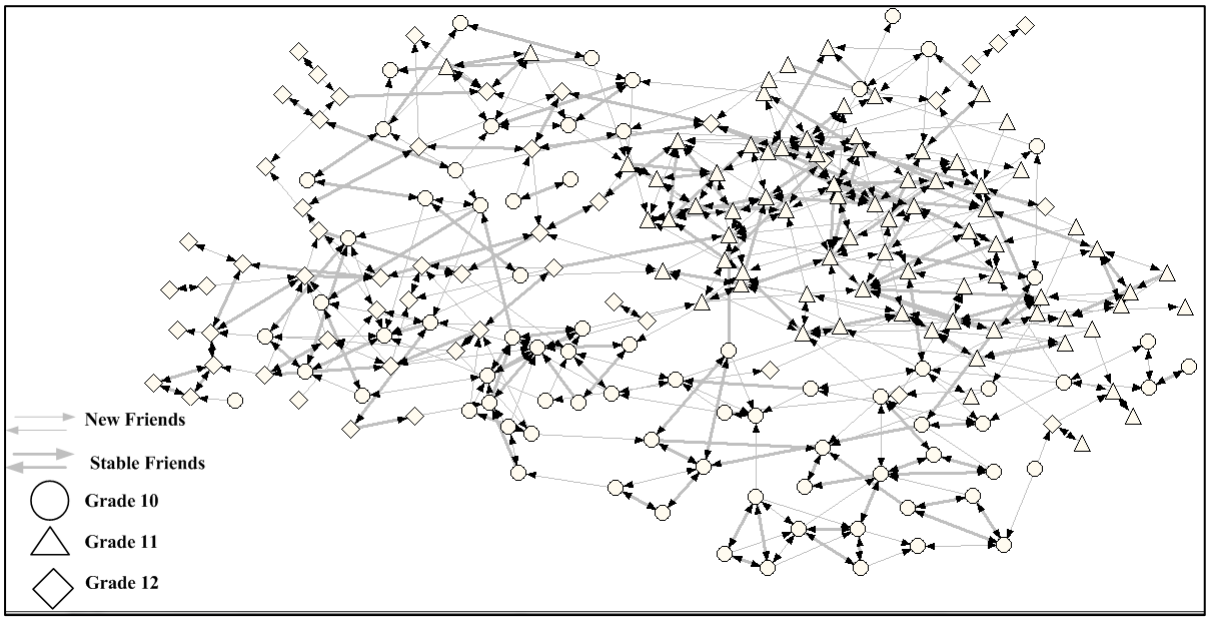

Figure 3. 2012-2013 Rural Stable and New Friendship Network (N=155)

Appendix B: Cross Table of the Number of Stable Friends by the Number of New Friends in the Urban School

	Number of New Friends						
Number of Stable Friends	0	1	2	3	4	5	total
0	0	11	16	20	24	52	123
1	6	8	10	20	26	0	70
2	6	3	13	25	0	0	47
3	1	16	28	0	0	0	45
4	1	13	0	0	0	0	14
5	0	0	0	0	0	0	0
total	14	51	67	65	50	52	299

Cross Table of the Number of Stable Friends by the Number of New Friends in the Rural School

	Number of New Friends						
Number of Stable Friends	0	1	2	3	4	5	Total
0	0	4	6	4	12	32	58
1	1	2	4	8	48	0	63
2	1	3	11	39	0	0	54
3	0	5	25	0	0	0	30
4	0	7	0	0	0	0	7
5	1	0	0	0	0	0	1
total	3	21	46	51	60	32	213

Appendix C: The Distribution of Friendship Composition in Urban and Rural School

Friendship composition		Urban	Rural	
One friend	1N	3.68%	1.88%	
	1S	2.01%	0.47%	
Two friends	2N	5.35%	2.82%	
	1S1N	2.68%	0.94%	
	2S	2.01%	0.47%	
Three friends	**3N**	**6.69%**	**1.88%**	*
	3S	0.33%	0.00%	
	1S2N	3.34%	1.88%	
	2S1N	1.00%	1.41%	
Four friends	4N	8.03%	5.63%	
	4S	0.33%	0.00%	
	1S3N	6.69%	3.76%	
	3S1N	5.35%	2.35%	
	2S2N	4.35%	5.16%	
Five friends	5N	17.39%	15.02%	
	5S	0.00%	0.47%	
	1S4N	**8.70%**	**22.54%**	***
	2S3N	**8.36%**	**18.31%**	**
	3S2N	9.36%	11.74%	
	4S1N	4.35%	3.29%	

Note: “S” indicates a stable friend. “N” indicates a new friend.
Two proportion Z-test, two tailed test *** p<.001 ** p<.01 * p<.05