

**Do You Like Me as Much as I Like You?
Friendship Reciprocity and Its Effects on School Outcomes among Adolescents**

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Abstract

Social scientists have long suspected that friendship dyads are not always reciprocated and those that are reciprocated are likely to be more intimate. Close friendships may provide youth with an environment conducive to healthy development and educational outcomes. Using the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative data set of youth, we examine how attributes of respondents and their friends affect the odds of reciprocity between adolescents. Asian Americans and females are the most likely to have reciprocated friendships. Interracial friendships are less likely to be reciprocated than intraracial friendships. Further, adolescents with reciprocated friendships report higher levels of school belonging. Finally, reciprocity and school belonging both exert independent effects on academic performance. Friendship reciprocity is an important indicator of social support above and beyond the numbers of friends reported by youth.

Do You Like Me as Much as I Like You? Friendship Reciprocity and Its Effects on School Outcomes among Adolescents¹

Introduction

Friendships between two individuals are commonly assumed to be reciprocal in nature. When I say someone is “my friend,” the implication is that this person also thinks of me as a friend. In general, reciprocity is one of the expectations about affective relations (e.g. Laursen, 1993). However, not all friendships are created equal, and certainly not all friendships are reciprocal by default. Furthermore, it is also reasonable to think that relationships that are reciprocated are substantially different from those that are not (Hartup, 1996). For example, in James Coleman’s seminal essay about social capital, one important feature of social capital is the reciprocity of expectations and norms (Coleman, 1988); similarly, friendships that are reciprocated are likely to be more emotionally supportive as well as a superior resource compared to friendships that are not reciprocal. If Anne and Bonnie both consider each other best friends, then there exists a set of mutually agreed upon norms and expectations between Bonnie and Anne. If David considers John to be one of his closest friends, but John does not consider David to be one of his closest friends, then there is an imbalance of power between the two individuals, and David cannot rely on John for psycho-social support or as a social capital resource in the same way that Anne and Bonnie can rely on one another for emotional support or information gathering. The social capital that exists between Anne and Bonnie is no doubt stronger than that which exists between David and John whether or not any of them are aware of the status of reciprocity imbedded in their relationships. Despite the apparent importance of the

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concept of reciprocity among friends, there is no extensive research linking individual and structural differences to differences in friendship reciprocity.

Our research focuses on friendship choices among schoolmates. Studying friendship reciprocity for adolescents in schools is of special interest because we are able to capture much of their social universe (Moody, 1999). This simplified setting allows us to study the general properties of affective relations. The majority of the relational choices adolescents make arguably occur among schoolmates; therefore we believe we capture the majority of the friends adolescents are likely to select. Similar analyses would be difficult to construct for adults because networks become more diverse and are less likely to be primarily located in a single setting. Certainly from childhood to adolescence, friends take center stage in the social world of the adolescent (Coleman, 1961).

The National Longitudinal Study of Adolescent Health (hereafter Add Health) is the first nationally representative data set that allows us to examine questions about friendship and reciprocity during adolescence. Unlike the majority of previous research on friendships, we do not have to rely on perceived reciprocity. In Add Health, information is supplied by both individuals –respondent and best friend; thus our analyses utilize *actual* rather than *assumed* friendship reciprocity.

Since friendships do not occur in a vacuum, but rather are embedded in multiple contexts, this study analyzes friendship reciprocity by taking into account how some contexts affect the likelihood of friendship reciprocity. The three contexts we consider are the individual, the relational, and the school context. The individual characteristics that might be related to the likelihood of having a reciprocal friendship are the socioeconomic background of the young, his/her gender, as well as the individual's race. For the relational aspect, we focus on the

interracial/intraracial nature of the friendship, and for the context, we focus on the school. This does not imply that other aspects might not be relevant when studying reciprocity, however, these have been typically used for the study of friendship. Below we describe how all these aspects might be related to whether a friendship is reciprocated.

In the second part of article we analyze how friendship reciprocity is related to the adolescent's well-being at school. We do this in two steps, first, we investigate the relationship between reciprocity and the sense of school belonging of the respondent; then we examine how these two (i.e. having a reciprocated friendship and the perception of school belonging) are independently related to the academic achievement of the students. We argue that reciprocal friendships are a relevant resource for improved school outcomes for the youth.

Theoretical Considerations and Hypotheses

During the past several decades, numerous studies have analyzed the meaning of friendship and its effects on adolescent behaviors. Researchers agree that friendships are a key part of the development of youth. A number of studies have examined the link between friendships and a variety of outcomes in adolescents (e.g. Antonio, 2001; Berndt, 1999, 2002; Billy and Udry, 1985; Giordano, Cernkovich, and Pugh, 1986). Much of this research, however, focuses on how peers shape negative behaviors such as the use of drugs or delinquency (e.g. Crosnoe, 2002; Kandel, 1978). In contrast to that research, in this study we focus on positive, school-related experiences. Building on the assumption that friends function as academic resources for the youth (Crosnoe, Cavanagh, and Elder, 2003), we further argue that the intimacy of the friendship moderates such function.

Clearly, adolescents' friendships are important to their social, cognitive, and emotional development (see Newcomb and Bagwell (1995) for a review). Friends provide a context in which youth learn key social skills and serve as a source of social support. However, a common pitfall in studying friendships is the assumption that friendships are reciprocal by definition (e.g. Erwin, 1998; Laursen, 1993). Further, research supports that the peer group and best friends differ in their level of influence on the youth. Best friends have long been known as more influential than the overall peer group (e.g. Epstein and Karweit, 1983), although little has been said about differences within types of "best friends".

In fact, recent evidence demonstrates that it is misleading to assume that friendships are created equal and thus can be measured as a monolithic concept. In her study of delinquent peers, Haynie shows that "not all adolescents are influenced to the same degree by their peer associates," and this can be traced back to the pattern of their interactions (Haynie 2001, p. 1051). Similar to Haynie, our study also uses reports of the friends themselves. This seems an appropriate way to measure the underlying strength and intimacy of dyads, which are likely to moderate the potential impact of friendships on individual outcomes. In contrast to this study we focus on the reciprocal status of the friendship and its impact on school outcomes.

Influences on Friendship Reciprocity

Socio-Economic Origin

Much research suggests that schools are more hospitable to higher SES than lower SES youth (Lareau, 2000). Furthermore, some argue that youth of higher SES background develop friendships with greater ease. Because these friends are more likely to be individuals they meet at school rather than from other settings, they can help protect students from anti-school

behaviors (Ellenbogen and Chamberland, 1997; Flores-Gonzalez, 2002). Coming from an advantaged family may help some children gain reciprocal friendships because they are more socially desirable in school. It is possible that more advantaged children become popular at their school because they have the latest gadgets, wear more fashionable clothes, or drive the nicest car. This is exactly what Milner argues in his recent book, where he proposes that adolescents' status strives to consumerism (Milner, 2004). Consequently, the chances of having friendships reciprocated are higher among youth from higher socioeconomic strata. Given the evidence described, we hypothesize that:

H₁: Higher socioeconomic standing is related with increased friendship reciprocity.

Whereas socioeconomic origin may promote reciprocal friendship relations among youth, the opposite might be true for immigrant status. Previous research demonstrates that immigrant children (first or second generation children) are less focused on peers and (pressured to be) more focused on their family networks compared to their third generation counterparts (Kao, 1995; 1999). Hence, immigrant youth are less likely to establish friendships than children of later generations (Aronowitz, 1984). Since first and second generation youth have more family responsibilities, this might preclude their chances of spending time with friends at school, which ultimately will be related with the latter reciprocating the feeling of being best friends.

H₂: Native-born youth are more likely to have reciprocal friendships than immigrant youth.

Gender Differences

Previous literature on friendship suggests that there are prominent differences between boys' and girls' networks. One study showed that, in general, girls' same-sex dyadic friendships tend to be more exclusive than those of boys (Eder and Hallinan, 1978). There is also evidence that compared to males, females maintain stronger relationships and share higher levels of disclosure (Billy and Udry, 1985). The development of exclusive and stronger relationships among girls may make friendships between girls more conversationally intimate than friendships between boys. On the other hand, compared to girls, boys tend to have a more open network that is less intimate, more volatile, and more likely to include new friends over time (Belle, 1989). In a study of early adolescents, Phillipsen finds that girls report more support in their friendships and have less conflict than do boys (Phillipsen, 1999). A recent qualitative study reports that, although its effects are not totally oppressive, boys' peer group culture poses obstacles in the development of close friendships because boys feel "the need to protect their vulnerability, prove their masculinity, and preserve their integrity when among their male peers" (Chu, 2005:12). The evidence does not imply that young males do not want to have intimate friendships; rather, they struggle more than girls in their efforts to achieve them. Following the findings above, we expect that:

H₃: A larger proportion of girls' friendships will be reciprocated compared with boys' friendships.

Racial and Ethnic Origin

Scholars tend to interpret racial and ethnic differences in friendships as the expression of cultural differences although it is unclear how such differences affect friendship intimacy. Some

researchers argue that some ethnic groups emphasize collectivism and others individualism, which in turn affect how the adolescent interprets his/her friendship with others. For example, Chen and Rubin (1992) found that white Canadian children (individualistic culture) were more accepting of best friends than Chinese Canadian children (collectivist culture). They conclude that the Chinese children in their sample may be less accepting of very close friends because they tend to form small “cliques” instead of dyadic friendships (like their white counterparts) and, as a result, the existence of a “best friend” is not clear, but rather it is represented in the whole small group. Their study, however, does not take into account whether the individuals that form the “cliques” are more likely to reciprocate for Asian or white children. We argue that Asian Americans’ small group of friends might be a very well-defined one, perhaps more stable than that of white adolescents, and thus still likely to be reciprocal.

Research on racial differences and friendship behaviors provides further evidence of variation in friendship characteristics among youth. A recent qualitative longitudinal study examines how friendships patterns differ for African American, Latino, and Asian American adolescents (Way, Gingold, Rotenberg, and Kuriakose, 2005). These authors argue that Hispanic and black adolescents establish and maintain friendships for a longer time, and that Asian American adolescents are the least likely to form close friendships because they are discouraged by their parents from spending time with friends outside school. If both black and Hispanic youth maintain their friendships for a long time, this is likely to improve their chances of strengthening friendship ties, and thus improve the chances of reciprocal friendships.

However, there is evidence supporting the opposite conclusion. Giordano, Cernkovich, and DeMaris (1993) compared family and peer relations of black adolescents to those of Whites. These scholars argue that African American youth tend to report lower levels of intimacy within

friendships along with less influence from their friends relative to white youth. Taken together, these studies are somewhat ambivalent about the relationship between minority status and the strength of their friendship. However, given that minority children may be more likely to be marginalized at school, we hypothesize the following:

H₄: Black, Hispanic, and Asian youth are expected to have fewer reciprocated friendships than whites.

Interracial Relationships

As mentioned above, we expect friendship reciprocity to differ not only by individual characteristics but also by the characteristics of the relationships. Beginning with studies from The Chicago School, we know that individuals tend to choose more homogeneous partners as intimacy increases. Most of the literature on interracial relationships highlights the lower rates of interracial relations compared with intraracial ones (e.g. Sigelman, Bledsoe, Welch, and Combs, 1996; Way and Chen, 2000). However, we know less about how the quality of heterogeneous relationships differs from homogeneous relationships. Research that compares interracial/interethnic with intraracial/intraethnic relationships presents mixed evidence regarding whether and how they differ from one another. Theoretically, one may expect the former to be more tenuous since in-group relationships are the norm. On the other hand, if interracial relationships are harder to form given societal pressures, one may expect heterogeneous friendships to be more intimate once they are formed. At the same time, others emphasize the difficulty for acceptance and the stigma attached to different-race relationships as well as lower levels of disclosure between different-race dyads (Billy and Udry, 1985; Kao and Joyner, 2004; Vaquera and Kao, 2005).

Kao and Joyner (2004) found that interracial best friends share fewer activities than those in intraracial relationships. Despite the fact that adolescents manage to break racial boundaries when choosing their best friends, Kao and Joyner argue that their friendships still face greater challenges than do those of the same race. An alternative explanation may be that adolescents of different races have different mental criteria to determine what makes of someone a “best friend.” Fujino (1997) uses a cultural argument to explain that expectations and misconceptions that adolescents have about the other race partially explain why interracial relationships are less likely to occur than intraracial relationships. Along these lines, Harris and Kalbfleisch (2000) show that strategies to initiate relationships with partners of another race are different from those used to date people of the same race. These arguments about interracial relationships might be suitable for friendship relations.

While not all research supports the existence of significant differences between interracial and intraracial relationships (e.g. Lee and Gudykunst, 2001; Mok, 1999), there is strong evidence suggesting that interracial relationships may be more difficult to maintain as well as less intimate (Billy and Udry, 1985). Because the published works that do not find differences among the relationships tend to use small non-representative samples, we hypothesize that:

H₅: Adolescents who choose a different-race best friend will be less likely to be reciprocated as a best friend.

School Context

Our third level of analysis deals with the contexts in which friendships takes place. School environments are likely to influence the reciprocity of friendships. For instance, some

have argued that small schools promote the well-being of youth because such schools maintain an intimate social environment (Bryk, 1996; Schoggen and Schoggen, 1988). Similarly, one would expect rural and suburban schools should provide more opportunities for stronger and reciprocal friendships (Moody, 1999).

Most importantly for the purposes of this study, the racial composition of the school may affect friendship patterns of students. For minority and immigrant students, what may matter most in determining friendship reciprocity is the number of students of similar backgrounds. Still others suggest that interracial friendship relations in biracial schools with groups of comparable size are less likely to occur (Goldsmith, 2004; Moody, 2001). Both these authors support the conclusion that there exists a curvilinear relationship between school heterogeneity and friendship. Our study differs in that we compare more than two racial groups and examine reciprocity rather than the number of friends. We hypothesize that friendship reciprocity does not depend on school context as long as students have a reasonable number of co-racial schoolmates, hence:

H₆. Racial distribution of the school has no significant direct effect on the level of friendship reciprocity

Reciprocity and School Outcomes

The final goal of this study is to analyze how friendship reciprocity is linked to students' feeling of school belonging. Authors have emphasized that friendship choices influence the development of adolescents. As we mentioned earlier, friends can promote either delinquent behaviors or positive outcomes (for reviews, see Corsaro and Eder, 1990; and Giordano, 2003). Adolescents who perceive their friendships as supportive (and thus likely reciprocal) are more

likely to be popular, motivated, and involved in school, have high achievement scores, and be socially competent than those with less supportive friendships. Friends can also function as sources of information, especially for disadvantaged children (Cauce, 1986; Crosnoe, et al., 2003). For example, for students whose parents have limited English proficiency or low educational levels, friends might be the principal source of information for academic decisions (Crosnoe, 2002; Valverde, 1987). In her ethnographic work with Latino youth, Flores-González (Flores-Gonzalez, 2002) creates a typology of the students in her study of what she calls “school kids,” or students who adopt an identity based on participation and achievement and have friendships predominantly with schoolmates, and “street kids,” students who form an identity in opposition to school and authority and develop most of their friendships outside of the school setting. Hence, we expect that:

H_{7a}: Youth with reciprocated friendships have higher levels of school belonging.

H_{7b}: Adolescents with reciprocated friendships have higher academic performance due to their higher levels of school belonging.

Data and Methods

We use data from Add Health, a nationally representative sample of 90,000 adolescents in grades 7-12 in 1994-1995 (Bearman, Jones, and Udry, 1997). Data were collected from students of 80 high schools that were randomly selected from a database of U.S. schools. Schools were stratified on size, region, urbanicity, school type, racial mix, and grade span. For each school a feeder school was also selected with probability proportional to its student contribution to the high school. The school-based sample therefore has a pair of schools in each

community and it includes a total of 134 schools, whose student populations vary from less than 100 to over 3,000 students (Bearman et al., 1997).²

Each participating school provided the study with a roster of its students. Identification numbers were assigned to the names on the roster. Copies of the list were provided to students to identify their friends when filling out the In-School questionnaire. In-School Questionnaires were completed by more than 90,000 adolescents, representing a participation rate of approximately 80% of all enrolled students at the sampled schools.

Add Health uniquely suits our research interests because respondents were asked to nominate up to five male and five female friends, from either the in-school roster or from among their out-of-school friends. If the friend was on the roster and also completed the questionnaire, we can identify characteristics of these friends such as race, ethnicity, gender, and all other items on the questionnaire. For this paper we use information on first-listed same-sex friends.³ We do this for two reasons. First, Hartup (1993) found that only 5% of cross-sex friendships are not romantic. Second, Add Health instructions given to the respondents about friendship nominations asked them to include romantic relationships. Since romantic relationships operate in very distinct ways, we chose to use a strict definition of friendship (i.e. first-listed same-sex friend). If the first-listed friend was not on the roster (that is, they did not attend the school) or they were absent from school on that day, then we were unable to find their racial/ethnic information. In these cases, we turned to the second-listed friend. If the respondent did not choose first or second friend or both were not in the school roster, this adolescent does not have an assigned best friend. Over 55% of the respondents chose an identifiable best same-sex friend.

² We exclude those schools with fewer than 3 students self-identified with each of the racial groups used in the study. We use this cutoff point to ensure that the possibilities of choosing a same-race/ethnicity relationship are real. We tested different cutoff points in auxiliary analyses, and found very similar results. Tables are available upon request.

³ For purposes of brevity, first-listed same-sex friend will be referred throughout the rest of the paper as best friend.

Table 1 summarizes the measures we use in this study. Because respondents (and their best friends) could choose up to five best friends, there are several ways to operationalize the concept of friendship reciprocity. Preliminary analyses examined two distinct measures of reciprocity. A *strict definition* proposes that best friends are only reciprocated if each of the nominator and nominee lists each other as their first-listed friend. In other words, this definition would only consider best friendships to be reciprocal if Anne lists Bonnie as her first-listed friend and Bonnie lists Anne as her first-listed friend. We also examined a more *lenient definition* that simply considers whether a respondent's first-listed friend also nominated the respondent among any of his/her listed friends. Specifically, for this study we considered a first-listed friendship to be reciprocal if Anne listed Bonnie as her first-listed friend and if Bonnie listed Anne among any of her five nominated friends. We opted for the more lenient definition of the term because friendships are likely to occur not only in dyadic form but also in small cliques. Our findings are virtually identical using either definition.

Our operationalization of reciprocity allows for respondents who each have several best friends to be able to include all of these friends. For example, if Anne, Bonnie, Cathy, and Diane are in a clique but Add Health required that they list their best friends in order, our count would consider that a friendship is reciprocated even if Anne listed (in order) Bonnie, Cathy, and Diane, but Bonnie listed (in order) Cathy, Diane, and Anne. In other words, if Anne nominated Bonnie as her best friend, but Bonnie nominated Anne as her 3rd best friend, our definition would consider this to be a reciprocated friendship. Reciprocity occurs (takes a value of 1) when the nominated best friend also nominates the respondent (i.e. who selected him/her as best friend) among his or her nominated best friends (up to five). We do not differentiate the position in which his/her best friend listed the respondent.

[Table 1 about here.]

In addition, we define interracial friendships to be those where the respondent and the nominated friend are from different racial backgrounds. For instance, an Asian American respondent who nominated a white best friend is considered to have an interracial relationship. In contrast, a Mexican American student (who is Hispanic) who nominates a Cuban American best friend (who is also Hispanic) would be considered as having an intraracial relationship.⁴ Gender is coded by using a dummy variable, where female=1, and male=0. In addition, we constructed dummy variables for racial background. In these analyses, and for the sake of simplicity, we have omitted adolescents who selected more than one racial group (multiracials), those who did not select a racial group, and those who chose “other race”. It would be difficult to define relationships as interracial for multiracial and other race individuals.

Consistent with the literature examined above, we suspect that class and immigrant status may additionally influence the characteristics of friendships, so we control for these differences in our upcoming regression analyses. Mother’s education (as reported by the adolescent in the In-School survey) is the only measure of family socioeconomic status available in the In-School sample. As we also presented earlier, generational status seems relevant in the study of friendship. We consider those adolescents who were born outside of the U.S to be first generation. Second generation youth are U.S.-born youth whose mothers were born outside of the U.S. Finally, third generation consists of youth who are U.S.-born and whose mothers were also born in the U.S. Again, it is likely that immigrant children (first or second generation children) are less focused on peers and more (pressured to be) focused on their family networks

⁴ Despite that “Hispanic” usually referred as “ethnicity”, for the purpose of this research, Hispanic is treated as a racial group, along with white, black, Asian, and Native American.

compared to their third generation counterparts (Kao, 1995; 1999). Hence, we expect immigrant children to be less likely to have reciprocal friendships.

The characteristics of the school might also condition the type of friendships formed, or if friendships are formed at all. Hence, we also control for school characteristics by measuring school size, the urbanicity of schools, as well as the proportion of students that are of the same race/ethnicity as the respondents. In line with the literature, we expect it to be easier for respondents in smaller schools to establish more intimate friendships which in turn lead to higher likelihoods of being reciprocated friendships (e.g. Bryk, 1996). Similarly, we suspect that suburban and rural schools can also promote reciprocal friendships due to their size and the greater intimacy of smaller communities. Finally, there is widespread evidence that adolescents tend to choose friends that are similar to them, and that opportunity plays an important role when selecting friends (Kandel, 1978; Joyner and Kao, 2000). In order to capture the opportunity of creating friendships with same race peers, we include a measure of the proportion of the student body reporting the same race as the respondent.

Because reciprocity is likely to be related to closeness or even intimacy between two individuals, we examine several measures of friendship interaction (i.e. activities) as reported by the respondent (similar to those employed by Kao and Joyner, 2004). Opportunities for interaction, as well as the activities that the friends perform together, are important predictors of the strength and influence of the friendship (Haynie, 2001). Accordingly, we first examine how many activities respondents reported participating in with their best friend over the last week. The five activities that students can report to have done with their best friend include going to his/her house, seeing the friend after school, spending time together during the weekend, talking on the phone with the friend, and talking to the friend about his/her problems. This is not a count

of the number of *times* these activities occurred; instead, it is a count of the number of *kinds* of activities that occurred (it ranges from 0 activities to a maximum of 5 activities, as listed above). In our analyses we focus on two specific friendship activities—spending time with the friend, and seeing the friend after school. We explore these two most closely because in auxiliary analyses, these two measures were the only characteristics that seemed to be related to the odds of having a reciprocated friendship.

In order to control for the effect of multiple friendship nominations on the odds of reciprocity, we examine the number of friends nominated by the respondent. This ranges from 1 to 5. Recall that, they have to nominate at least one friend to be in our sample, and Add Health allows them to nominate up to five best friends. We also control for the number of friends nominated by the nominee. We expect that the more friends the nominee lists in his/her survey response, the more likely the respondent's nomination will be reciprocated.

Again, the second part of this study focuses on the relationship between friendship reciprocity and indicators of school well-being. Friendship is an arena for social interaction, and thus it has the capability of transmitting knowledge and shaping one's social self-concept (Fine 1980; Crosnoe, et al., 2003); however, reciprocated friendships are likely to be substantially different from those that are not (Hartup, 1996). We build on these assumptions to argue that knowledge and the sense of self-concept is likely to be transmitted unevenly depending on the reciprocal status of the relationship. Thus, we hypothesize that youth with stronger (reciprocal) friendships will feel more integrated at school and consequently their school achievement will also be improved. In order to examine this relationship, then we first examine whether reciprocity is related to the sense of what we have termed *school belonging*⁵. Lastly, we test whether both

⁵ Previous work on school attachments has used different terms to name similar concepts to what we call "school belonging." For example, Bollen and Hoyle (1990), and Moody and White (2003) use the term "social cohesion."

reciprocity and school belonging have independent effects on the educational achievement of the adolescent measured as grade point average (GPA). Grade point averages of the respondents range from 0 to 4, with higher values indicating better academic performance.

School belonging is a composite measure that ranges from 1 to 5. It is coded using the mean from students' responses to the following statements: "I feel close to people at this school", "I feel like I am part of this school", "I am happy to be at this school", "I feel socially accepted." We coded the responses as 1, when the respondent "strongly disagreed", up to a value of 5 when the respondent "strongly agreed" with the statement. Thus, higher values on this factor indicate higher levels of school belonging. We performed a factor analysis on these components with a resulting Cronbach's alpha of 0.86. The high coefficient alpha (>0.60) supports the internal consistency and reliability of the construct.

Descriptive Analyses

Table 2 presents cross-tabulations between our independent variables and reciprocity. The asterisks indicate t-tests of the statistical significance of the differences between the means. We observe that interracial friendships are less likely to be reciprocal, as they comprise approximately 18% of all relationships but only 15% of reciprocated and 23% of non-reciprocated friendships. As hypothesized, girls reciprocate at higher levels than boys (60% and 40% respectively). Whites form the majority of our sample. Blacks and Hispanics have higher levels of non-reciprocated friendships than other racial groups, for that reason their share of the whole sample increases when we take into consideration only non-reciprocated relationships. No important differences are observed for the proportion of Asians in the sample when we look

McNeely and Falci (2004) use the term "school connectedness" for a similar construct.

at their proportion of the sample among reciprocal or non-reciprocal friendships. The age of the respondents seems to be fairly stable across all three samples (i.e. overall, reciprocal, and non-reciprocal). Hence there is no evidence of increasing or decreasing reciprocity by age. As for generational status, most of the respondents are third generation (about 74%). There are no apparent significant changes in this distribution of reciprocal and not reciprocal friendships for nativity status. The school characteristics also seem to be stable across subsamples. Students attend schools that have about 1000 students and about 58% attend suburban schools, 30% attend urban schools, and about 12% attend rural schools. As for the racial composition of the school we observe that students in reciprocal relationships attend schools slightly more populated with children of the same race as the respondent (60% and 55% respectively).

There is variation in the characteristics of friendships depending on whether the relationship is reciprocated. Very small differences are apparent for the number of activities youth engaged in with the best friend—the mean is almost two activities (for the overall sample, as well as reciprocated and non-reciprocated friendships). However, whereas 35% of the overall sample spent time with their friend, 37% of those in reciprocal friendships did so, but only 32% of those respondents whose nominations are not reciprocated spent time with their best friend. The pattern for the other activity reported, seeing friend after school, is similar albeit less evident. Thirty-nine percent of the overall sample did see his/her best friend after school, 40% of those in reciprocated and 37% of those in non-reciprocated friendships. Finally, the number of friends nominated by the respondents in this study is not very different for the entire sample compared to those in reciprocal and non-reciprocal friendships (4.42 versus 4.48 and 4.31 respectively). Thus, reciprocity does not seem related to the number of friends one nominates. Sharp differences appear for the number of friends nominated by the nominee (i.e. best friend).

Here we observe that, whereas the mean for the overall sample is about 4 friends, the means for reciprocal friendships is about 4.5 friends and only about 3 friends for those in non-reciprocal relationships. That is, as expected, those best friends that nominate more friends are also the ones that are most likely to reciprocate simply because there is a greater chance of doing so. In predictive analyses we control for the effects of these differences. Finally, the differences between reciprocal and non-reciprocal friendships regarding sense of school belonging do not seem major (about 15 for both groups), but they are nevertheless significant.

[Table 2 about here.]

Table 3 presents a more complex picture of how race and gender interact to affect reciprocity patterns of adolescents. This division by gender shows even more extreme values than the previous table. For all racial groups, females enjoy higher levels of friendship reciprocity than males. Interestingly, males who are black or Hispanic actually have slightly more friendships that are not reciprocated than reciprocated. This is not the case for the females of any racial or ethnic background. Among both males and females, whites are most likely to enjoy a reciprocated friendship. Specifically, 61% of white males and 76% of white females experience a reciprocal friendship. Among males, blacks are least likely to experience a reciprocal friendship, with only 46% reporting such a friendship. For females, Native American youth are the least likely to have a reciprocated friendship, with about 59% of their first-listed friends reciprocating their friendship.

In numbers not shown in the table, we also find substantial differences for males and females involved in interracial and intraracial friendships. Males who nominate an interracial best friend have a reciprocity rate lower than 50%. This pattern, in which the reciprocated friendships are less likely to occur than non-reciprocal friendships, does not happen among the

nominations of girls. Despite this, 65% of interracial relationships are reciprocated compared with 73% of intraracial friendships among girls; this is a much higher rate of reciprocity than among boys.

[Table 3 about here.]

We use multilevel logistic regression models to predict the probability that best friends reciprocate nominations of respondents. To account for the complex sampling design of Add Health, we use models that adjust for design effects. More specifically, we adjust for differences in selection probabilities, clustering, dependence of observations within sampling strata, and response rates. We also weighted our sample in the analytical models. This allows sample totals to serve as estimates of population totals and compute unbiased estimates of variance and standard errors (Tourangeau and Shin, 1998; Chantala and Tabor, 1999; Chantala, 2002).⁶ We obtain our log-likelihood estimates in Tables 4 through 6 from models using conventional estimation procedures because *svy* estimators in Stata are not reliant on “true likelihoods” (Statacorp, 2001).

Table 4 presents the multivariate analysis for the likelihood of having a reciprocal friendship net of individual, relationship, and contextual effects. Model 1 includes a single independent variable that measures whether the relationship is interracial. The odds are less than 1, which suggests that interracial relationships are less likely to be reciprocated than same-race friendships. Specifically, intraracial friendships are almost twice ($1/0.54$) as likely to be reciprocated than interracial friendships. This is consistent with previous findings that interracial friendships face greater obstacles than intraracial friendships (for example, Billy and Udry, 1985;

⁶ Add Health was designed as an unequal probability cluster sample. This design complicates the statistical analysis because the observations are no longer independent and identically distributed and thus methods that take into account the complex sampling design are the most appropriate for analyzing the data. In this study we use *svy* estimators in Stata for the predictive models. The coding of the variables as well as the descriptive analyses were performed with SAS.

Vaquera and Kao, 2005). Model 2 adds gender and race to the analytic model. As in our descriptive analyses, we still observe that different-race relationships are not as likely as same-race friendships to be reciprocated by the nominated friends. This model also shows evidence supporting our first hypothesis that girls are almost twice as likely as boys to reciprocate their friendships. The pattern in which girls are more likely to have reciprocated friendships than boys persists and even increases in our subsequent models where other controls are added. Consistent with research that argues that females have longer lasting, more disclosing, and more exclusive friendships, it is reasonable that these friendships are also reciprocated more often for girls than for boys (Belle, 1989; Billy and Udry, 1985; Eder and Hallinan, 1978). As for the racial groups, we observe that Asians and Native Americans are the minority groups with comparable odds of having a best friend reciprocate his/her friendship nomination relative to that of whites. Blacks and Hispanics have, respectively, 47% and 31% less chance to have the friendship reciprocated by their best friend than whites.⁷ If, as others have reported (Giordano, Cernkovich, and DeMaris, 1993), minority youth receive less pressure from their peers than Whites, this might also leave more room for choosing a “best friend,” since there might not be that one “very influential person” in their lives.

[Table 4 about here.]

In Model 3, we also take into account age, mother’s education, generational status of the respondent, and school characteristics to the model. In this model, intraracial relationships and girls’ relationships are still the most likely to be reciprocated. However, after controlling for individual and school characteristics, we find that Asian Americans report the highest levels of

⁷ We considered the possibility that this difference in reciprocity for both black and Hispanic youth relative to whites could be product of the geographic source of their friends. That is, that Blacks and Hispanics have more friends from outside the school, and thus by definition, the friends are not part of the Add Health Sample and cannot nominate them in return. However, specific analyses on the source of the friends indicate no significant differences among the groups (tables available upon request).

reciprocated friendships compared to whites. This was not apparent in our descriptive analyses. Moreover, against what we expected in Hypothesis 4 the odds that Hispanics have friendships that are reciprocated are similar to those of whites. In addition, this suggests that the lower reciprocity rates of Hispanics in Model 2 may be due to their lower socioeconomic status and higher likelihood of being a first generation immigrant, both identified by previous literature as important predictors for friendship formation (Aronowitz, 1984). In Model 3, black adolescents still display lower levels of reciprocity, which in turns suggests that, unlike other racial groups, (as stated in Hypothesis 4) differences in parental educational attainment seem insufficient to understanding the lower reciprocity rates of black youth.

Model 4 adds friendship activities to our model. Here, we hypothesize that friendship reciprocity may be directly related to the number of activities respondents share with their friends. We find that while some of these characteristics have modest explanatory power, they do not explain the variation in reciprocity rates between interracial and intraracial friends, between males and females, and between blacks and other groups. In other words, interracial friendships are less likely to be reciprocated not simply because these friendships share fewer activities (see Kao and Joyner, 2004), but also because they may be more difficult to maintain.

On the whole, black youth seem to be the most disadvantaged when it comes to friendships at school. They have the lowest rates of reciprocity even after we include measures of socioeconomic status, school characteristics, and activities performed with friends. This may indirectly suggest that black students are especially at risk of having tenuous ties to their friends. Friendships at school, as we demonstrate later, are especially important for maintaining attachment to school during adolescence. The lack of reciprocal friendships, especially

compared to other racial groups, might have a negative effect on their overall well-being, and in their school outcomes in particular. We analyze this possibility below.

Influence of Reciprocity on School Outcomes

To further investigate the importance of reciprocity on the adolescent life, we consider its effects on some key aspects of the social and educational lives of the youth. Table 5 shows the relationship between friendship reciprocity and school belonging. Next, Table 6 builds on Table 5 to present a regression analysis of the effects of friendship reciprocity on the grade point average (GPA) of the students after controlling for variation in school belonging. As stated earlier, students might not know whether the friendship is reciprocated or not, but it is reasonable to expect that there are important consequences of reciprocity.

Table 5 analyzes the effects of reciprocity on adolescents' sense of school belonging. The results suggest that those adolescents in reciprocal friendships are slightly more likely to be integrated at school than those youth in non-reciprocated relationships. Models 1 through 5 show a positive effect of reciprocity on school belonging. Individual, background, and contextual measures are not able to completely account for the effect of reciprocity on school belonging. Most of these measures do not appear to be statistically significant. Some individual characteristics show informational patterns regarding the individual's belonging in school. For instance, females exhibit lower levels of school belonging than males despite all controls. This may be due to girls' lower self-esteem during adolescence. Black youth also have lower levels of school belonging, though this effect is small and disappears when all controls are added in the models. On average, older students are less integrated at school than younger students. In addition, youth from highly educated families tend to be better adapted than those from lower

educated backgrounds. As hypothesized earlier, schools provide a more comfortable environment for middle- and upper-class youth. The models do not show other relevant significant racial differences among minority groups and white youth.

[Table 5 about here.]

Table 6 builds on the results reported in the previous table. In this analysis we argue that having a reciprocated best friend is a process and resource that affects the well-being of the individual, which in turn will affect how the student performs at school. We assume that having close friends impacts student educational outcomes. We believe that students benefit from meaningful and supportive friendships in two ways. First, friendship may impact their sense of well-being; second, it may strengthen their ties to school. Both of these paths lead to better educational outcomes. We have chosen grade point average (GPA) as the school outcome of interest.

[Table 6 about here.]

Consistently, all the regression models show that having a reciprocated relationship has a positive impact on student GPA. Even after including individual, relationship, and contextual effects, reciprocity remains to be statistically significant. The interracial nature of the relationship does not have an effect on the student GPA once individual and other contextual and friendship factors are incorporated in the models. Finally, these models show well-documented patterns in education, such as that girls obtain better grades than boys, or that Asians are the highest scoring students. The effect of friendship reciprocity, although positive, does not account for the lower educational outcomes of Blacks, Hispanics, or Native American students compared to white adolescents. Model 5 shows that time spent with the best friend and the number of best friends also have positive impacts on the grades of the respondents. The

predictive models support the argument that more time spent with school friends is linked to positive educational outcomes. This provides further evidence that more intimate friendships benefit educational outcomes.

Conclusion

Our study finds systematic differences in the rates for reciprocity of best friends among adolescents. As expected in *Hypothesis 1*, we find that youth with better-educated mothers enjoy higher rates of friendship reciprocity. Similarly, our findings are consistent with *Hypotheses 2 and 3*, which suggests that native-born youth and girls, respectively, enjoy higher levels of reciprocity. These findings are consistent with previous work using smaller data sources. Previous research has argued that immigrant youth are less likely to establish romantic relationships than their native counterparts (King and Harris, 2003). Our research extends this finding to friendship relationships.

However, our results regarding minority groups were more complex. *Hypothesis 4* stated that blacks, Hispanics, and Asians would have lower rates of reciprocity. While minorities on the surface had lower rates of friendship reciprocity than whites, their relative disadvantage was accounted by variation in individual and school characteristics. In our analytic models, we find that with these controls, Asian Americans had the highest rates of friendship reciprocity and Hispanics enjoyed levels comparable to those of whites. This is likely due to the large shares of Asian and Hispanic youth who are first or second generation. African Americans are the most disadvantaged in their levels of reciprocated friendships in both our descriptive and analytic tables.

With respect to characteristics of friends and the context of friendship, our findings were consistent with *Hypothesis 5*, which stated that interracial friendships would be less likely to be reciprocated than intraracial friendships. This pattern is largely consistent with previous research (including some work that uses the same data) that finds interracial relationships to be more difficult to form and maintain. Finally, consistent with *Hypothesis 6*, we find that the racial composition of schools did not affect the relative odds of reciprocity. In other words, while racial composition may affect the formation of friendships, it does not influence the closeness of these ties once they are in place. Youth who attend smaller schools were more likely to have a reciprocated friendship.

Having a best friend has been linked to desirable developmental outcomes (e.g. Hartup, 1993). However, does not only having a perceived friendship, but an actual reciprocated one have further consequences on the well-being of the adolescent? The answer to the question is yes, and in a consistently positive manner. Consistent with *Hypothesis 7_a*, we found strong and consistent effects of reciprocity on feelings of school belonging. Moreover, and in support of *Hypothesis 7_b*, we find strong evidence that adolescents with reciprocated friendships enjoy higher levels of educational outcomes than those whose friendships are not reciprocated. We find that reciprocal friendships as well as those friendships that share more activities have independent and significant effects on students' GPA. Although a direct effect of reciprocity and grades may be spurious, this suggests that youth who are isolated from peers can suffer dire consequences not only through the lack of peer support, but also through weak ties to their school.

As with all survey data, there are some caveats. Students whose best friends we do not have information for may in fact be in a reciprocal friendship, but we cannot measure it. While it

would have been ideal to have information about friends outside of school, there would not be a comparable measure of friendship reciprocity (unless we had information about everyone in the universe of possible friends). We strongly believe that friendships within schools are more relevant to feelings of school belonging and academic performance. Furthermore, because our data is cross-sectional, we cannot look at the differences in the stability nor the duration of friendships. A more stable and longer friendship may have a greater impact on an individual than a more sporadic or new friendship.

Our findings also suggest that friendships may be a mechanism through which class differences in educational outcomes occur. Higher socioeconomic status is related to higher rates of friendship reciprocity. This may occur through higher rates of extracurricular activities among more advantaged youth or it may also occur via the affordability of material goods by higher income youth that promote their popularity. Again, we cannot directly assess these possibilities.

Discussion

Despite the fact that almost all adolescents report having friends, not all friendships are reciprocal in nature. In his 1995 presidential address to the *Society for Research in Child Development*, Willard Hartup insisted on the need for more studies that address the qualitative features of the friendship relationships. He claimed that researchers need to move beyond the question of whether the child has a friend or not, and instead look into the qualities of the friendship. Even youth without friends can almost always name “friends” if asked to do so (Furman, 1996, in Hartup, 1996), which makes the study of friendship reciprocity an interesting tool to assess the validity of the friendship claims. Despite Hartup’s call, the availability of data

that allow researchers to address this vacuum in the literature has been scarce. With more datasets that help researchers address these characteristics of the friendships, we can provide further evidence of the diversified effects of friendships during adolescence.

Overall, we find friendship reciprocity to be an important dimension of adolescent life. This research cannot identify the specific mechanisms that explain how reciprocity influences the well-being of the adolescent. Qualitative researchers have recently attempted to respond to this issue, but many questions remain unanswered (see Way and Hamm, 2005). Future research should also examine how and if these effects matter for adults whose social lives are likely to center around family obligations rather than friendship ties. It is likely that as it is for adolescents, characteristics of adult friendships are linked to race, immigrant status, age, and gender. It is not so evident that the effects are as strong for adults as they appear for youth. Few sociologists have examined this area of research, and we believe our study is an important step towards a greater understanding of the attributes of friendships and the relevance of strong friendship ties.

References

- Antonio, A.L. 2001. Diversity and the Influence of Friendship Groups in College. *The Review of Higher Education*, 25:63-89.
- Aronowitz, Michael. 1984. The Social and Emotional Adjustment of Immigrant Children: A Review of Literature. *International Migration Review*, 18:237-257.
- Bearman, P., Jones, J., and Udry, J.R., 1997. The National Longitudinal Study of Adolescent Health: Research Design. [On-line]. Available: <http://www.cpc.edu/projects/addhealth/design.html>
- Belle, D., 1989. Gender Differences in Children's Social Networks and Supports. In: Belle, D. (Ed.), *Children's Social Networks and Social Supports*. Wiley, New York.
- Billy, J.O.G. Udry, J.R., 1985. Patterns of Adolescent Friendship and Effects on Sexual Behavior. *Social Psychology Quarterly* 48, 27-41.
- Berndt, T. J. 1999. Friends' Influence on Students' Adjustment to School. *Educational Psychologist*, 34:15-28.
- Berndt, T. J. 2002. Friendship Quality and Social Development. *Current Directions in Psychological Science*, 11:7-10.
- Bollen, K.A. and Hoyle, R.H. 1990. Perceived Cohesion: A Conceptual and Empirical Examination. *Social Forces* 69(2): 479-504.
- Bryk, A.S., 1996. Lessons from Catholic High Schools on Renewing our Educational Institutions. In: McLaughlin, T.H., O'Keefe, J., and O'Keefe, B. (Eds.), *The Contemporary Catholic School: Context, Identity, and Diversity*. Falmer Press, London.
- Cauce, A., 1986. Social Networks and Social Competence: Exploring the Effects of Early Adolescent Friendships. *American Journal of Community Psychology* 14, 607-628.
- Chantala, K. and Tabor, J., 1999. *Strategies to Perform a Design-Based Analysis Using the Add Health Data*. Carolina Population Center, University of North Carolina at Chapel Hill.
- Chantala, K., 2002. *Introduction to Analyzing Add Health Data*. Carolina Population Center, University of North Carolina at Chapel Hill.
- Chen, X. and Rubin, K.H., 1992. Correlates of Peer Acceptance in a Chinese Sample of Six-Year Olds. *International Journal of Behavioral Development* 15, 259-273.
- Chu, J.Y., 2005. Adolescent Boys Friendships and Peer Group Culture. In: Way, N. and Hamm, K.V. (Eds.), *The Experience of Close Friendships in Adolescence*. *New Directions for Child and Adolescent Development* 107, 7-22.

- Coleman, J.C., 1961. *The Adolescent Society: The Social Life of the Teenager and Its Impact on Education*. Free Press, New York.
- Coleman, J.C., 1988. Social Capital in the Creation of Human Capital. *American Journal of Sociology* 94, S95-S120.
- Corsaro, W.A. and Eder, D., 1990. Children's Peer Cultures. *Annual Review of Sociology* 16, 197-220.
- Crosnoe, R., 2002. High School Curriculum Track and Adolescent Association With Delinquent Friends. *Journal of Adolescent Research* 17, 143-167.
- Crosnoe, R., Cavanagh, S. and Elder, G.H. 2003. Adolescent Friendships as Academic Resources: The Intersection of Friendship, Race, and School Disadvantage. *Sociological Perspectives* 46:331-352.
- Eder, D. and Hallinan, M.T., 1978. Sex Differences in Children's Friendships. *American Sociological Review* 43, 237-250.
- Ellenbogen, S. and Chamberland, C., 1997. The Peer Relations of Dropouts: A Comparative Study of At-Risk and not At-Risk Youths. *Journal of Adolescence*. 20:355-367.
- Epstein, J. and Karweit, N., 1983. *Friends in School: Patterns of Selection and Influence in Secondary Schools*. Academic Press, New York.
- Erwin, P., 1998. *Friendship in Childhood and Adolescence*. Routledge, New York and London.
- Fine, G.A., 1980. The Natural History of Preadolescent Male Friendship Groups. In: Foot, H., Chapman, A., and Smith, J. (Eds.), *Friendship and Social Relations in Children* (pp.293-320). Wiley, New York.
- Flores-Gonzalez, Nilda. 2002. *School Kids/Streets Kids: Identity Development in Latino Students*. New York: Teachers College Press.
- Fujino, D.C., 1997. The Rates, Patterns and Reasons for Forming Heterosexual Interracial Dating Relationships among Asian Americans. *Journal of Social and Personal Relationships* 14, 809-828.
- Furman, W., 1996. The Measurement of Children and Adolescents' Perceptions of Friendships: Conceptual and Methodological Issues. In: Bukowski, W.M., Newcomb, A.F., and Hartup, W.W. (Eds.), *The Company They Keep: Friendships in Childhood and Adolescence*. Cambridge University Press, Cambridge, MA.
- Giordano, P.C., 2003. Relationships in Adolescence. *Annual Review of Sociology* 29, 257-281.

- Giordano, P.C., Cernkovich, S.A., and DeMaris, A., 1993. The Family and Peer Relations of Black Adolescents. *Journal of Marriage and the Family* 55, 277-287.
- Giordano, P.C., Cernkovich, S.A., and Pugh, M.D. 1986. Friendships and Delinquency. *The American Journal of Sociology* 91,1170-1202.
- Goldsmith, P.A., (2004) Schools' Role in Shaping Race Relations: Evidence on Friendliness and Conflict. *Social Problems* 51, 587-612.
- Harris, T.M. and Kalbfleisch, P.J., 2000. Interracial Dating: The Implications of Race for Initiating a Romantic Relationship. *The Howard Journal of Communications* 11, 49-64.
- Hartup, W.W., 1993. Adolescents and Their Friends. In: Laursen, B. (Ed.), *Close Friendships in Adolescence: New Directions for Child Development* (60:3-22). Jossey-Bass, San Francisco.
- Hartup, W.W., 1996. The Company They Keep: Friendship and Their Developmental Significance. *Child Development* 67, 1-13.
- Haynie, D.L., 2001. Delinquent Peers Revisited: Does Network Structure Matter? *American Journal of Sociology* 106, 1013-1057.
- Joyner, K., and Kao, G., 2000. School Racial Composition and Adolescent Racial Homophily. *Social Science Quarterly*, 81, 810-825.
- Kandel, D.B., 1978. Homophily, Selection, and Socialization in Adolescent Friendships. *American Journal of Sociology* 84, 427-436.
- Kao, G., 1999. Psychological Well-Being and Educational Achievement Among Immigrant Youth. In: Hernandez, D.J. (Ed.), *Children of Immigrants: Health, Adjustment, and Public Assistance* (pp.410-477). National Academy Press, Washington D.C.
- Kao, G., 1995. Asian-Americans as Model Minorities? A Look at Their Academic Performance. *American Journal of Education* 103, 121-159.
- Kao, G. and Joyner, K., 2004. Do Race and Ethnicity Matter among Friends? Activities among Interracial, Interethnic, and Intraethnic Adolescent Friends. *The Sociological Quarterly* 45, 557-573.
- King, R.B. and Harris, K.M., 2003. Romantic Relationships Among Immigrant Adolescents. Unpublished Manuscript.
- Lareau, Annette, 2000. *Home Advantage: Social Class and Parental Intervention in Elementary Education*. Rowmand and Littlefield, Lanham.
- Laursen, B. (Ed.), 1993. Close Friendships in Adolescence. *New Directions for Child*

- Development* 60, 3-32. Jossey-Bass, San Francisco.
- Lee, C.M. and Gudykunst, W.B., 2001. Attraction in Initial Interethnic Interactions. *International Journal of Intercultural Relations* 25, 373-387.
- McNeely, C and Falci, C. 2004. School Connectedness and the Transition Into and Out of Health-Risk Behavior Among Adolescents: A Comparison of Social Belonging and Teacher Support. *Journal of School Health* 74 (7), 284-292.
- Milner, M. Jr. 2004. *Freaks, Geeks, and Cool Kids: American Teenagers, Schools, and the Culture of Consumption*. New York: Routledge.
- Mok, T.A., 1999. Asian American Dating: Important Factors in Partner Choice. *Cultural Diversity and Ethnic Minority Psychology* 5, 103-117.
- Moody, J., 2001. Race, School Integration, and Friendship Segregation in America. *American Journal of Sociology* 107, 679-716.
- Moody, J., 1999. *The Structure of Adolescent Social Relations: Modeling Friendship in Dynamic Social Settings*. Dissertation. University of North Carolina, Chapel Hill, NC.
- Moody, J., and White, D.E. 2003. Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups. *American Sociological Review* 68 (1), 103-127.
- Newcomb, A.F. and Bagwell, C.L., 1995. Children's Friendship Relations: A Meta-Analytic Review. *Psychological Bulletin* 117, 306-347.
- Phillipsen, L.C., 1999. Associations Between Age, Gender, and Group Acceptance and Three Components of Friendship Quality. *Journal of Early Adolescence* 19, 438-464.
- Schoggen, P., and Schoggen, M. 1988. Student Voluntary Participation and High School Size. *Journal of Educational Research*, 81(5), 288-293.
- Sigelman, L., Bledsoe, T., Welch, S., and Combs, M.W., 1996. Making Contact? black-white Social Interaction in an Urban Setting. *American Journal of Sociology* 101, 1306-1332.
- Statacorp, 2001. *Stata Statistical Software*. Release 7.0. College Station, TX: Stata Corporation.
- Tourangeau, R. and Shin, H., 1998. *National Longitudinal Study of Adolescent Health: Grand Sample Weight*. Carolina Population Center, University of North Carolina at Chapel Hill.
- Valverde, S.A., 1987. A Comparative Study of Hispanic High School Dropouts and Graduates: Why Some Leave School Early and Some Finish. *Education and Urban Society* 19, 320-329.

- Vaquera, E. and Kao, G., 2005. Private and Public Displays of Affection among Interracial and Intra-racial Adolescent Couples. *Social Science Quarterly* 86, 484-508.
- Way, N. and Chen, L., 2000. Close and General Friendships Among African American, Latino, and Asian American Adolescents From Low-Income Families. *Journal of Adolescent Research* 15, 274-301.
- Way, N. and Hamm, J.V. 2005. The Meanings and Experiences of Friendship in Adolescence. In N. Way & J. Hamm (Eds): *New Directions in Child and Adolescent Development*. 107.
- Way, N., Gingold, R., Rotenberg, M., & Kuriakose, G. 2005. Close Friendships among African American, Latino, and Asian American Youth: A Qualitative Account. In N. Way & J. Hamm (Eds). *Close Friendships among Adolescents. New Directions For Child and Adolescent Development*. 107, 41-59.

Table 1: Definitions of Measures

Measures	Definition
Reciprocity	Dummy variable. 1=Best friend chooses respondent among his/her best friends 0= Respondent not nominated among all the listed friends
School Belonging	Composite measure (ranges between 1-5) from answers to: I feel like I am part of this school I am happy to be at this school I feel socially accepted
Grade Point Average (GPA)	Average of self-reported grades on: Mathematics, History/Social Studies, English/Language Arts, and Science (ranges between 0-4)
Interracial	Dummy variable. Interracial friendship=1, Intra-racial friendship=0
<i>Gender</i>	
Female	Dummy variable. Female=1, Male=0
<i>Race</i>	
White	Dummy variable. Yes=1, No=0 (reference)
Black	Dummy variable. Yes=1, No=0
Hispanic	Dummy variable. Yes=1, No=0
Asian	Dummy variable. Yes=1, No=0
Native American	Dummy variable. Yes=1, No=0
Age	Measured in years
Mother's Education	Measured in years of education
<i>Generational Status</i>	
First Generation	Respondent not born in the U.S.
Second Generation	Respondent born in the U.S. and mother not born in the U.S.
Third Generation	Mother and respondent born in the U.S.
Missing generation	Not information on place of birth available
<i>School Characteristics</i>	
School size	Number of students in school
Urban	Dummy variable. Yes=1, No=0 (reference)
Suburban	Dummy variable. Yes=1, No=0
Rural	Dummy variable. Yes=1, No=0
Proportion of same race at school	Percentage of student body that reports the same race as respondent
<i>Friendship Characteristics</i>	
Number of activities with friend	No. of activities performed w/ friend in previous week (ranges between 0-5)
Spent time with friend	Dummy variable. Yes=1, No=0
Saw friend after school	Dummy variable. Yes=1, No=0
<i>Friendship Nominations</i>	
Number of friends nominated by R	Ranges from 1-5
Number of friends nominated by best friend	Ranges from 0-5

Table 2: Descriptive Analysis Relevant Variables by Type of Friendship

	All Respondents with Friends	Reciprocal	Non-Reciprocal
<i>Racial Homophily</i>			
Interracial friendship	17.78%	14.91%	22.94%
Intraracial friendship	82.22	85.09	77.06
<i>Gender</i>			
Male	45.88	40.32	56.12
Female	54.12	59.68	43.88
<i>Race</i>			
White	63.70	67.84	56.28
Black	15.89	13.68	19.86
Hispanic	14.60	12.93	17.79
Asian	4.80	4.77	4.90
Native American	0.90	0.77	1.16
Age	14.93	14.98	14.85
Mom's education	13.56	13.63	13.42
<i>Generational Status</i>			
First generation	8.04	7.10	9.74
Second generation	7.71	7.52	8.04
Third generation	74.27	76.45	70.37
Missing generation	9.96	8.92	11.84
<i>School Characteristics</i>			
School size	972	969	978
Urban	29.63	27.99	32.59
Suburban	57.96	59.03	56.05
Rural	12.39	12.98	11.35
Proportion of same race at school	57.82	59.21	55.34
<i>Friendship Characteristics</i>			
Number of activities with best friend	1.90	1.99	1.73
Spent time with best friend	35.03	36.94	31.63
Saw friend after school	38.93	39.81	37.37
<i>Numbers of Friends Nominated</i>			
Number of friends nominated by R	4.42	4.48	4.31
Number of friends nominated by best friend	4.08	4.57	3.20
N	41,081	26,378	14,703

Note: T-test for differences in means between reciprocal and non-reciprocal relationships.
 *The difference between "reciprocal" and "non-reciprocal" is significant at the ***p<0.001 level for all measures.

Table 3: Reciprocity by Gender and Race (percentages)

	Males		Females	
	Reciprocal	Nonreciprocal	Reciprocal	Nonreciprocal
Interracial	48.91%	51.09%	65.29%	34.71%
Intraracial	58.87	41.13	72.61	27.61
White	61.00	39.00	75.78	24.22
Black	46.17	53.83	62.39	37.61
Hispanic	48.75	51.25	65.35	34.65
Asian	59.44	40.56	69.09	30.91
Native American	52.22	47.78	59.04	40.96
Overall	56.98	43.02	71.49	28.51
N	10,635	8,030	15,743	6,278

Table 4: Predictors of Friendship Reciprocity by Respondent's Best Friend (Odds Ratios)

	Model 1	Model 2	Model 3	Model 4
Interracial friendship	0.54 *** (0.02)	0.73 *** (0.04)	0.71 *** (0.04)	0.74 *** (0.04)
<i>Gender</i>				
Male		--	--	--
Female		1.94 *** (0.08)	2.02 *** (0.09)	2.34 *** (0.11)
<i>Race</i>				
White		--	--	--
Black		0.53 *** (0.04)	0.55 *** (0.04)	0.71 *** (0.05)
Hispanic		0.69 *** (0.04)	0.92 (0.08)	1.10 (0.10)
Asian		0.90 (0.09)	1.11 (0.14)	1.26 (0.13)
Native American		0.73 (0.17)	0.68 (0.17)	0.77 (0.25)
Age		1.05 ** (0.02)	1.07 *** (0.02)	1.07 *** (0.01)
Mom's education			1.04 *** (0.01)	1.03 ** (0.01)
<i>Generational Status</i>				
First generation			0.70 *** (0.06)	0.80 * (0.07)
Second generation			0.99 (0.07)	0.96 (0.07)
Third generation			--	--
Missing generation			0.87 (0.09)	0.89 (0.09)
<i>School Characteristics</i>				
School size			1.00 ** (0.00)	1.00 *** (0.00)
Urban			--	--
Suburban			1.10 (0.08)	1.01 (0.07)
Rural			1.13 (0.10)	1.05 (0.08)
Proportion of same race at school			1.00 (0.00)	1.00 (0.00)
<i>Friendship Characteristics</i>				
Number of activities with best friend				1.29 *** (0.03)
Spent time with best friend				0.89 * (0.04)
Saw friend after school				0.86 ** (0.04)
<i>Friendship Nominations</i>				
Numbers of Friends Nominated by R				1.00 (0.02)
Number of friends nominated by best friend				1.68 *** (0.02)
N	37,792	37,372	30,756	30,756
Log-Likelihood	-6,802,085	-6,536,276	-5,249,091	-4,677,474

*p<0.05; **p<0.01; ***p<0.001.

Note: Estimates of model log-likelihood came from standard logit estimates; standard errors were obtained from a survey specific procedure.

Table 5: Predictors of School Belonging by Reciprocity of Relationship

	Model 1		Model 2		Model 3		Model 4		Model 5	
Intercept	2.94	***	2.95	***	3.65	***	3.25	***	2.89	***
	(0.02)		(0.02)		(0.10)		(0.10)		(0.10)	
Reciprocal	0.06	***	0.05	***	0.07	***	0.06	***	0.03	*
	(0.01)		(0.01)		(0.01)		(0.01)		(0.01)	
Interracial friendship			-0.06	**	-0.06	**	-0.04		-0.04	
			(0.02)		(0.02)		(0.03)		0.03	
<i>Gender</i>										
Male					--		--		--	
Female					-0.11	***	-0.09	***	-0.07	***
					(0.01)		(0.01)		(0.02)	
<i>Race</i>										
White					--		--		--	
Black					-0.07	**	-0.05	**	-0.03	
					(0.03)		(0.02)		(0.02)	
Hispanic					-0.01		0.07	*	0.09	*
					(0.03)		(0.03)		(0.03)	
Asian					-0.05		-0.01		0.00	
					(0.04)		(0.06)		(0.06)	
Native American					-0.04		0.02		0.02	
					(0.08)		(0.09)		(0.08)	
Age					-0.04	***	-0.04	***	-0.04	***
					(0.01)		(0.01)		(0.01)	
Mom's education							0.03	***	0.03	***
							(0.00)		(0.00)	
<i>Generational Status</i>										
First generation							0.03		0.05	
							(0.03)		(0.03)	
Second generation							-0.03		-0.03	
							(0.02)		(0.02)	
Third generation							--		--	
Missing generation							-0.01		0.01	
							(0.04)		(0.04)	
<i>School Characteristics</i>										
School size							0.00		0.00	
							(0.00)		(0.00)	
Urban							--		--	
Suburban							-0.01		-0.02	
							(0.02)		(0.02)	
Rural							0.03		0.02	
							(0.03)		(0.04)	
Proportion of same race at school							0.00	*	0.00	*
							(0.00)		(0.00)	
<i>Friendship Characteristics</i>										
Number of activities with best friend									0.00	
									(0.01)	
Spent time with best friend									0.03	
									(0.02)	
Saw friend after school									0.04	**
									(0.02)	
<i>Friendship Nominations</i>										
Numbers of Friends Nominated by R									0.07	***
									(0.01)	
Number of friends nominated by best friend									0.01	*
									(0.00)	
N	35,145		35,145		34,849		29,001		29,001	
Log-Likelihood	-40,353		-40,335.00		-39,847		-32,489		-32,271	

*p<0.05; **p<0.01; ***p<0.001.

Note: Estimates of model log-likelihood came from standard regression estimates; standard errors were obtained from a survey specific procedure.

Table 6: Predictors of GPA by Reciprocity and School Adaptation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	2.69 *** (0.03)	2.07 *** (0.04)	2.10 *** (0.04)	2.50 *** (0.16)	1.52 *** (0.16)	1.41 *** (0.16)
Reciprocal	0.19 *** (0.01)	0.16 *** (0.01)	0.15 *** (0.01)	0.10 *** (0.01)	0.08 *** (0.01)	0.08 *** (0.01)
School adaptation		0.22 *** (0.01)	0.22 *** (0.01)	0.22 *** (0.01)	0.20 *** (0.01)	0.19 *** (0.01)
Interracial friendship			-0.09 *** (0.02)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
<i>Gender</i>						
Male				--	--	--
Female				0.16 *** (0.02)	0.17 *** (0.02)	0.15 *** (0.02)
<i>Race</i>						
White				--	--	--
Black				-0.35 *** (0.05)	-0.31 *** (0.05)	-0.31 *** (0.05)
Hispanic				-0.31 *** (0.05)	-0.17 ** (0.06)	-0.17 ** (0.06)
Asian				0.33 *** (0.04)	0.28 *** (0.07)	0.28 *** (0.07)
Native American				-0.50 *** (0.08)	-0.37 *** (0.09)	-0.37 *** (0.09)
Age				-0.03 ** (0.01)	-0.02 ** (0.01)	-0.02 ** (0.01)
Mom's education					0.07 *** (0.00)	0.07 *** (0.00)
<i>Generational Status</i>						
First generation					0.10 (0.05)	0.10 * (0.05)
Second generation					0.09 * (0.04)	0.09 * (0.04)
Third generation					--	--
Missing generation					-0.19 *** (0.05)	-0.19 *** (0.05)
<i>School Characteristics</i>						
School size					0.00 (0.00)	0.00 (0.00)
Urban					--	--
Suburban					-0.06 (0.04)	-0.07 (0.04)
Rural					-0.07 (0.06)	-0.07 (0.06)
Proportion of same race at school					0.00 (0.00)	0.00 (0.00)
<i>Friendship Characteristics</i>						
Number of activities with best friend						-0.02 * (0.01)
Spent time with best friend						0.07 ** (0.02)
Saw friend after school						0.00 (0.02)
<i>Friendship Nominations</i>						
Numbers of Friends Nominated by R						0.03 *** (0.01)
Number of friends nominated by best friend						0.00 (0.01)
N	33,916	31,805	31,805	31,557	26,572	26,572
Log-Likelihood	-46,820	-43,056	-43,033	-41,976	-34,141	34,111

*p<0.05; **p<0.01; ***p<0.001.

Note: Estimates of model log-likelihood came from standard regression estimates; standard errors were obtained from a survey specific procedure.