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Different preferences or different opportunities? Explaining race differentials in the academic achievement of friends

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Abstract

A popular explanation for race and ethnic disparities in academic achievement is that minorities are exposed to different peers and have different opportunities to make friends with high-achievers. Although we know that adolescents from different race and ethnic groups attend different schools and that they choose different friends, we do not know how these different opportunities affect the friends they make. This paper fills this gap by studying how the opportunities within adolescents' schools affect race and ethnic differences in the academic characteristics of friends. Using data from the National Longitudinal Study of Adolescent Health and the conditional logit and opportunities framework, I account for adolescents' different opportunities to make friends both within and across schools. Ignoring their different opportunities, Black and Latino adolescents' nominated friends have significantly lower levels of achievement than white adolescents. After accounting for their different opportunities to make friends within and between schools, race and ethnic differences in the achievement characteristics of friends disappear. If Black and Latino adolescents' opportunity structures were identical to white adolescents', their probabilities of nominating high-achieving friends would not differ.

Keywords

Adolescents; Academic achievement; Friendship; Race/ethnicity; Schools

1. Introduction

Achievement gaps exist across race and ethnicity in the United States (Jencks and Phillips, 1998; Kao and Thompson, 2003). Although these gaps declined in the last 30 years, significant disparities remain unexplained even after accounting for differences in socioeconomic status and family background (Gamoran, 2001). A popular explanation for racial/ethnic disparities in achievement is that Black, White, and Latino adolescents are exposed to different peers and make different friends. If friends affect academic achievement, the lower overall levels of achievement among minority adolescents' friends disadvantages minority populations compared to Whites and helps to maintain and exacerbate achievement disparities.

Recent research shows that, indeed, the achievement characteristics of adolescents' friends differ by race and ethnicity. High-achieving Black and Latino students are less likely to be nominated as friends by their same-race peers and Black and Latino students' friends have lower levels of academic achievement on average compared to White students (Fryer and Torelli, 2010). The question this article seeks to answer is: Why?

Friendships result from a combination of opportunities and preferences. Who individuals' friends are is constrained by the social environments in their schools, neighborhoods, churches, and workplaces (Blau, 1977). In adolescence, schools play a central role in social life, structuring friendships and identities (Coleman, 1961). However, minority adolescents attend different schools than White adolescents. On average, the schools minorities attend have more minority students and tend to have lower levels of overall achievement. As a result, minorities' opportunities to be friends with high-achieving adolescents are constrained. To what extent are the lower academic achievement characteristics of Black and Latino adolescents' friends the result of the opportunity structures in the schools attended by Black and Latino students, and to what extent are these patterns driven by preferences for lower-achieving friends?

This article studies the race and ethnic differences in the achievement profiles of adolescents' nominated friends. Using data from the National Longitudinal Study of Adolescent Health (Add Health), I show, consistent with previous literature, that Black and Latino students have friends with significantly lower levels of academic achievement compared to White adolescents. However, this result confounds opportunities and preferences. To what extent are differences the result of different opportunities that Black and Latino students have to nominate high-achieving friends compared to White students, and to what extent are differences the result of different preferences? Using a discrete choice analysis, I model adolescents' combined race and achievement preferences for friends, accounting for adolescents' different opportunities between and within schools to nominate high and lower-achieving friends. I show that the negative relationship between high achievement and friendship nomination among Black and Latino students is driven largely by adolescents' friend opportunities rather than their preferences. Although Black and Latino students nominate friends with lower levels of achievement on average, this analysis shows that these differences result almost entirely from differences in opportunities rather than different preferences. If Black and Latino adolescents' opportunity structures were identical to White adolescents', their probabilities of nominating high-achieving friends would not differ.

2. Background

2.1. Friends and academic achievement

Sociologists have argued for decades that friends play an important role in the lives of children, particularly with respect to educational achievement and attainment (Sewell et al., 1969; Sewell and Hauser, 1975). They generate norms and provide important support and resources, not received elsewhere (Coleman, 1988; Portes, 1998). Frank et al. (2008), for example, show that adolescents are responsive to the norms of their local school environments, and these norms affect course-taking behaviors. Similar research shows that

high achieving friends protect against failure, pull low achieving students up, and encourage more advanced course taking (Altermatt and Pomerantz, 2005; Crosnoe et al., 2003; Riegle-Crumb et al., 2006; Frank et al., 2006). If access to high-achieving peers differs by race and ethnicity, the benefits gained by White students through their friends may be lost to minority students.

Others suggest that the friends and peers of minorities affect race and ethnic achievement differentials by creating negative, oppositional norms (Fordham and Ogbu, 1986; Ogbu, 1978). These authors argue that minority groups take on an anti-education stance as a result of the perception that schooling will not pay off in the future. Minority groups classified as “involuntary migrants”, who came to the United States through slavery, colonization, or conquest, compare their opportunities and their groups’ outcomes to those of the white majority population. Seeing a distinct difference in outcomes, perhaps as a result of persistent discrimination and their negative history, minority adolescents reject the pro-school norms of the dominant culture and embrace an anti-education oppositional culture.

In contrast to theories of positive influence, oppositional culture theory has implications for both the way friends influence one another and how friendships develop. According to Downey, “schooling is espoused by and controlled by the dominant group, and so to pursue success via schooling is considered to be acting white. As a result, academically successful Blacks are sanctioned by Black peers for selling out to whites” (2008, p. 110). The implication is that minority adolescents will avoid friendships and associations with academically successful peers. In other words, oppositional culture theory predicts that “involuntary migrant” minority groups will prefer same-race friends with lower levels of achievement compared to White adolescents.

There is, of course, the further question: Which minority groups qualify as “involuntary migrants” and should be subject to an oppositional culture? Black adolescents have traditionally been the focus of this theory (Fordham and Ogbu, 1986; Ogbu, 1978) and a large amount of research attempts to establish the existence of an oppositional culture among this population. Most work provides little evidence in support for this theory (see for example, Ainsworth-Darnell and Downey, 1998; Cook and Ludwig, 1998; Downey and Ainsworth-Darnell, 2002; Harris, 2006; Harris and Robinson, 2007; Horvat and Lewis, 2003; Tyson et al., 2005). Black and White adolescents do not differ with respect to achievement gains once early achievement is controlled (Harris and Robinson, 2007). Nor do high-achieving Black and White adolescents differ on self-reported popularity or attachment to school (Ainsworth-Darnell and Downey, 1998; Cook and Ludwig, 1998). Black and White adolescents have similar educational expectations once sociodemographic differences are controlled (Kao and Tienda, 1998), and high-achieving Blacks feel well accepted among their peers (Harris, 2006; Horvat and Lewis, 2003).

However, a recent study shows that high-achieving Black students are less popular (based on friendship nominations) among their same-race peers compared to high-achieving White students and lower-achieving Black students (Fryer and Torelli, 2010). Regressing students’ academic achievement and race on their same-race popularity,¹ they show that the relationship between the number of friendship nominations received and academic

achievement is different for different racial/ethnic groups. While high-achieving White students receive more friendship nominations than their lower-achieving same-race peers, high-achieving Black students have on average 1.5 fewer same-race friends than high-achieving White students and are less nominated than their lower-achieving Black peers. In other words, Black students are significantly less likely to be friends with high-achieving peers while White adolescents are significantly more likely to be friends with high-achieving peers. This study provides some contradictory evidence about whether an oppositional culture exists among Black adolescents.²

Although understudied, the limited residential, economic, and social integration of Puerto Ricans, Dominicans, Mexicans, and immigrants from many smaller Latin American countries, along with a history of poverty-driven migration suggest that an oppositional culture may occur within these populations as well (Nelson and Tienda, 1985; Tienda and Mitchell, 2006). A few articles broaden oppositional culture theory to include Mexican, and Puerto Rican origin Americans, as well as Hispanics and Latinos more generally, again with mixed results (Fryer and Torelli, 2010; Kao and Tienda, 1998; Lundy, 2003). Fryer and Torelli (2010), for example, show that high-achieving Latino adolescents are even less popular among their peers than high-achieving Black adolescents. Others, however, find no differences between White and Latino origin adolescents in their educational expectations or their attachment towards school (Kao and Tienda, 1998; Lundy, 2003).

Although the evidence that an oppositional culture exists among either Black or Latino adolescents is limited at best, it remains a popular explanation for race and ethnic disparities in achievement in both academic and popular press³ (Gamoran, 2001).

2.2. Opportunities vs. preferences

Oppositional culture theory predicts that Black and certain Latino origin adolescents should have different preferences for high-achieving friends compared to White adolescents. And Fryer and Torelli (2010) show that high and lower-achieving Black and Latino adolescents indeed choose different friends than White adolescents. However, Peter Blau famously observed, “You can’t marry an Eskimo when no Eskimo is around”. The relative size of any group within a social setting impacts the extent to which preferences to associate with members of that group can be realized (Blau, 1977). Because adolescents from different race and ethnic groups attend different schools, they potentially have different opportunities to be friends with high-achievers. For example, in 2000, the average White child attended a school that was 78% White while the average Black and Latino students attended schools

¹Fryer and Torelli (2010) study same-race popularity as opposed to general popularity in order to get at Black disparagement of high-achieving Blacks. General popularity conflates popularity among White students and popularity among Black students. A high-achieving Black student could be both popular among White students and unpopular among Black students. Depending on the characteristics of the school, high-achieving Black students could appear generally popular while being unpopular among other Black students, masking patterns consistent with oppositional culture.

²Farkas, Lleras, and Maczuga (2002) also find some support for the theory, showing that Black adolescents are more likely to have friends who make fun of kids who do well in school, compared to White adolescents, and that in schools with large minority populations high-achieving Black boys are more likely to be put down by their peers.

³Cultural explanations for achievement differentials are common in the popular press. Examples include the New York Times November 19, 2005 article “Computing the Cost of ‘Acting White’” or the Economist May 10, 2008 article “Nearer to Overcoming”. Barack Obama even alluded to this explanation for achievement differentials in his keynote address at the 2004 Democratic Convention saying: “. . . children can’t achieve unless we raise their expectations and turn off the television sets and eradicate the slander that says a Black youth with a book is acting White.”

that were 57% Black and Latino respectively (Logan et al., 2002). In fact race and ethnic segregation of schools has steadily increased since the 1990s (Orfield, 2001) suggesting that students from different race and ethnic backgrounds are experiencing very different schooling environments than they did only a few decades ago.

Recent studies link the racial/ethnic segregation of schools to achievement gaps across race and ethnicity showing that segregation increases achievement gaps (Card and Rothstein, 2007) but primarily by reducing minority achievement (Hanushek et al., 2009). Although the mechanisms for explaining achievement gaps are not explored, these studies hint at the potentially different peers that White, Black, and Latino students experience, not only in terms of race and ethnicity but also academic achievement. “[M]inority students in segregated schools, no matter how able they may be as individuals, usually face a much lower level of competition and average preparation by other students” (Orfield 2001, p. 10). Indeed, a simple tabulation of data from the National Longitudinal Study of Adolescent Health⁴ shows that the self-reported grade point averages of students in the schools attended by Black and Latino adolescents are significantly lower than those attended by White adolescents. Whereas the average Black adolescent attends a school where 18% of students have a GPA over 3.5 (on a 4.0 scale), the average White adolescent attends a school where 27% of students have a GPA over 3.5.

Within race and ethnic groups, these differences are even larger. The average White adolescent attends a school where 30% of the White students have GPAs over 3.5, whereas the average Black adolescent attends a school where only 12% of Black students have GPAs over 3.5. The average Latino student attends a school where only 13% of Latino students have GPAs over 3.5. In other words, even if Black and Latino adolescents had the same preferences for high-achieving friends, they do not have the same opportunities to realize those preferences.

Even in circumstances where White, Black, and Latino adolescents attend the same school, Black and Latino students are often separated into different classrooms and informal tracks than White students (Lucas, 1999). Given the strong relationship between course taking and academic performance (Gamoran and Mare, 1989), if Black and Latino students are more likely to take lower level courses, they are coming in contact with fewer high-achieving *possible* friends. The result is that even if Black, White, and Latino students attended the same schools, their opportunities to make high-achieving friends may differ because they come in contact with high-achievers less frequently.

The race and ethnic segregation of schools and the relationship between race/ethnicity and overall achievement in a school, illustrate the challenge of separating opportunities for friends from preferences for friends. To what extent are the academic patterns of friendship choice that Fryer and Torelli (2010) observe the result of opportunities and to what extent are they the result of preferences?

⁴To my knowledge a descriptive account of the academic characteristics of White, Black, and Latino students’ classmates/peers is not available from an already published source. I conducted this simple analysis myself.

I am by no means the first to grapple with the question of opportunities vs. preferences. An important body of research takes up the issues illustrated in Blau's work, focusing on how opportunities and preferences impact racial/ethnic homophily in friendships. This research shows that opportunities do indeed matter to adolescents' friendship choices with respect to race/ethnicity. Opportunities affect who adolescents can choose as a friend. If a White student attends a school that is primarily White, she has few opportunities to choose a non-White friend, even if she has a strong preference for a non-White friend. Studying general patterns of friendship, cross-race friendships are rare (Hallinan and Williams, 1989) but increase with school racial/ethnic diversity (Quillian and Campbell, 2003). Accounting for differences in opportunities to choose cross-race friends across schools diminishes the size of the tendency for same-race friendships but by no means eliminates it. In other words, same-race preferences for friendship are strong even after differences in opportunities to nominate cross-race friends are controlled (Mouw and Entwisle, 2006; Quillian and Campbell, 2003; Zeng and Xie, 2008). Of course, these preferences for same-race friends vary in important ways depending on the race/ethnic composition of schools. Preferences for cross-race friendships decline as the size of a particular race/ethnic group within a school declines (Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003).

This research provides important insights into race/ethnic homophily and preferences for *race and ethnicity* in friendships among adolescents. Race/ethnic homophily is strong as are race/ethnic preferences for friends. By contrast, the goal of this article is to study differences in preferences for *academic achievement* across race and ethnicity, *net* of preferences for same-race friendships. However, these observations of racial/ethnic preferences have important implications for estimating achievement preferences across race. If same-race preferences for friends are as strong as previous research suggests, then within race and ethnic groups, opportunities to be friends with high-achievers are potentially particularly small for Black and Latino adolescents.

2.3. Research questions

Although minority students clearly make different friendship choices with respect to academic achievement, existing research does not distinguish between opportunities and preferences. Does the observed difference in the academic characteristics of friends exist because Black, White, and Latino adolescents have different preferences for high-achieving friends, as oppositional culture theory predicts, or are differences the result of different opportunity structures? Distinguishing between these possibilities will provide an account of how friendships are made, and, in turn, through what channels these friendships may contribute to achievement disparities.

The question this study seeks to answer is:

Can differences in the achievement characteristics of White, Black, and Latino adolescents' friends be explained by differences in opportunity structures within and between schools?

Building on Fryer and Torelli's (2010) description of friendships across race and ethnicity, I model adolescents' friend preferences, accounting for their different opportunities to choose high-achieving friends between schools and within schools. Distinguishing opportunities

from preferences contributes to the continuing debate on whether an oppositional culture exists among minority adolescents in the US but more significantly it answers the question of why different race adolescents have friends with different levels of academic achievement. If friends provide important resources and social norms that shape adolescents' behaviors and expectations, understanding how and why friendship choices are made is fundamental to explaining race and ethnic inequalities.

3. Data and methods

3.1. Data

This analysis uses data from the National Longitudinal Study of Adolescent Health (Add Health), an ideal dataset for studying adolescent friendships. It is the only nationally representative survey of adolescents and their complete in-school friendship groups. Add Health surveyed seventh- through twelfth-grade students in 144 sampled schools in 80 US communities between September of 1994 and April of 1995 ($N = 89,940$). Nearly all students in participating schools completed the in-school survey, containing basic socio-demographic information including academic achievement (self-reported grades) and friendship nominations. Each student was asked to nominate his/her five closest male friends and five closest female friends. All students participating in the in-school survey were linked to their nominated in-school friends, providing a unique opportunity not only to consider the relationship between race, academic achievement, and friendships but also to model adolescents' friend preferences net of opportunities, and the characteristics that determine their preferences. Because data are collected only for in-school friends, my analysis is limited to adolescents' in-school friendships and their preferences for in-school friends (Bearman et al., 1997).

Additional transcript data were collected for approximately 12,000 respondents (91% of Wave III respondents). These data provide detailed achievement and course-taking information during the high school years for a subset of original respondents. (Riegle-Crumb et al., 2005).

3.2. Conditional logit model with corrections for opportunity

I model adolescents' friend preferences using a discrete-choice analysis. Although traditionally used in economics to study transportation, housing, and consumer choice problems, discrete choice models extend nicely to the case of friendship choice. This method of analysis allows me to compare an adolescent's nominated friends to the set of students in school that the adolescent could have nominated but did not. This set of chosen and non-chosen friends represents an adolescent's friend opportunities. For individual i , the observed utility (V) of friend alternative n is a function of the individual's characteristics (X) and the friend alternative's characteristics (Y), or:

$$V_{in} = a_n + X_{in}\beta_n + Z_i Y_n \quad (1)$$

The probability (π) of choosing friend alternative n by individual i is:

$$\pi_i(n|D) = \frac{\exp[V_{in}]}{\sum_{m \in D} \exp[V_{im}]}, n \in D \quad (2)$$

where D is the set of friend alternatives, including the chosen friends (Ben-Akiva and Lerman, 1985; McFadden, 1978). The friend dyad is the unit of analysis and all models condition on the respondent. The model therefore includes multiple observations for each respondent and the additive effects of all individual characteristics on friend choice are netted out of the model.

In this case, the set of possible friend choices is defined as all students within the school. The size of each individual's choice-set is one minus the number of students in the school. The number of observations within one school is therefore the number of students in the school, N , multiplied by each individual's choice-set. The smallest school in Add Health contributes 600 observations to the analysis while the largest school contributes 6,505,050. Because the size of each individual's choice-set grows with the school size, I randomly sample a set of possible friends within each school to represent each individual's non-chosen friends within the choice-set. All chosen friends are sampled with a probability equal to 1, and 100 non-chosen individuals are sampled with probability equal to the inverse of the number of non-chosen individuals within the school.⁵ Because non-chosen alternatives are randomly sampled, no sampling correction is required and estimates should be unbiased (Ben-Akiva and Lerman, 1985; McFadden, 1978; Parsons and Kealy, 1992).

Although, in principle, adolescents are able to choose any friend within the school, their opportunities to choose friends within the school are not equal. Schools are stratified on many dimensions, but most notably by grade. Students in the same grade are more likely to come in contact with one another than students in different grades and their likelihood of contact likely declines as the distance between grades increases. In other words, a 12th grader is more likely to come in contact with an 11th grader than with a 10th grader, and more likely to come in contact with a 10th grader than a 9th grader. Because contact structures opportunities, even within schools, adolescents do not have the same opportunities to choose different friends. Indeed, the realized friendships of adolescents within and across grades in the Add Health data follow this pattern. As the distance between grades increases, the number of friendships decreases. Following Zeng and Xie (2008), I include an offset in all models of friend preferences to account for differences in opportunities within schools across grades to choose friends. Assuming contact patterns across grades follow realized friendship patterns across grades, I treat opportunity as a continuous decreasing function of the distance in grade levels (g), between individual i and friend alternative n or:

$$O_{in} = \frac{1}{(g_{in} + 1)^2} \quad (3)$$

⁵Individuals are sampled within the school rather than within the grade because students are in principle able to nominate any friend within the school.

Because race and achievement are distributed relatively uniformly across grade levels, this offset does not affect estimates of race and achievement preferences dramatically. However, the inclusion of this offset makes the model more realistic.

Students are also stratified within schools based on course-taking patterns. Two students who take the same set of courses are more likely to come in contact with one another than two students who take different courses. In contrast to grade level, which is generally independent of both race/ethnic composition and academic achievement, course-taking is not. Ideally, course-taking would be incorporated into the offset term to account for the greater opportunities that students who take similar courses have to make friends with one another. Although course-taking information is available for a subset of in-school respondents (approximately 10%), in order to incorporate this information into the offset it is needed for all in school respondents. As I discuss below, course-taking will enter into the estimation directly as a characteristic of respondents and their friends.

3.3. Assumptions

This analysis assumes that all individual characteristics are exogenous to friend characteristics and are fixed. Race and ethnicity in principle satisfy this assumption, although the racial/ethnic identification of adolescents may be affected by their friends, particularly among multi-racial/ethnic adolescents (Herman, 2004). Academic achievement is not fixed. Adolescents' academic achievement often changes across time and may be affected by their friends. As a result, some of the observed preference for or against academic achievement may result from influence rather than choice. In particular, the preferences of adolescents for similarly achieving friends are overestimated; a portion of the preference for similarity is likely the result of influence.

This paper also assumes that nominated friends are students' preferred friends. In reality, friendships are much more complicated. Ben may prefer Michael as a friend, but because Michael does not want to be friends with Ben, Ben must choose another friend, Martin. This paper treats Martin as Ben's preference when in fact Michael is Ben's preference. One way to deal with this problem is to exploit the fact that respondents' friendship nominations are not required to be reciprocated. In fact, approximately 60% of friend nominations in the data are not reciprocated. Reciprocated friendships may be different than unreciprocated friendships. Reciprocated friendships may represent students' actual friends, whereas unreciprocated friendships may represent students' desired friends.⁶ In order to better capture adolescents' actual preferences, I model preferences based on all nominated friends, then on only their reciprocated friendships, and finally only on their unreciprocated friendships. All models generate substantively consistent results. I present and discuss models that include all friendship nominations.⁷

⁶Unreciprocated friendships may also result from the limits that are placed on survey respondents when they nominate friends. If an individual has six female friends, she is not able to include all six in the survey. If that individual's sixth friend nominates her, it will appear that it is an unreciprocated friendship when it is in fact reciprocated.

⁷Estimates from models including only reciprocated friends and only unreciprocated friends are available from the author upon request.

4. Measures

4.1. Dependent variable

The dependent variable in this analysis is friendship choice. For each possible friendship dyad within the school, the dyad is assigned a 1 if the respondent nominates the fellow school mate as a friend, and 0 if he does not. Friendship choice is not required to be reciprocated; whether the school mate nominates the respondent does not change the fact that the respondent nominated the school mate. This variable comes directly from the friend nominations; each individual in the school was asked to nominate his or her five closest male friends and five closest female friends. Respondents can have up to 10 1's in their choice-sets.

Because the unit of analysis is the friendship dyad, rather than the individual, each observation is not independent. Although the model conditions on the respondent, the respondent enters into the dependent variable multiple times as a potential friend for other respondents. To account for the non-independence of observations across individuals within schools, standard errors are clustered by school id. This adjustment should correct for the possible underestimate of standard errors.

4.2. Independent variables

The focus of this analysis is on race/ethnic and achievement differences in friend preferences. I present results for three race/ethnic groups: Black, Latino, and White. Asian/Pacific Islanders, American Indian, and students who identify as Other are distinguished and included in all models. Results for these groups are available from the author upon request. Racial/ethnic categories are mutually exclusive. Students who identify as both Black and Latino are coded as Latino. Including them in the Black rather than Latino category does not change results substantively. Respondent and friend race are defined in the same way. Because the model conditions on the individual, the respondent's race only enters the model interactively.

Latino groups are heterogeneous and this heterogeneity could lead to vastly different preferences for high-achieving friends among Latino adolescents from different origin countries. For example, while Mexican and Puerto Rican migration is driven primarily by poverty, and these groups tend to be economically and socially isolated from other groups. Others, such as Cubans, are primarily political refugees and more integrated economically and socially (Tienda and Mitchell, 2006). Given heterogeneity across ethnic origin groups within the category of Latino, and because these differences could have important implications for whether oppositional subcultures exist and in turn whom adolescents from these groups are friends with, I also separate the Latino group into origin country subgroups. Initial models were estimated including the following categories: Mexican/Mexican American, Chicano/Chicana, Cuban, Puerto Rican, Central/South American, other Hispanic. Because these detailed categories did not add to the explanatory power of models and because they detracted from the precision of estimates, I include two Latino categories distinguishing Mexican, Chicano, and Puerto Rican origin adolescents from other Latin origin groups.⁸

To capture the academic achievement of respondents, their friends, and their possible friends, I calculate an average grade point average from respondents' self-reported grades in English, math, science, and social studies. Grade points are assigned with the following values, $A = 4$, $B = 3$, $C = 2$, $D = 1$, summed, and divided by 4.⁹ An individual who reports a GPA greater than or equal to 3.5 (for example, 2 A's and 2 B's) is defined as high-achieving. Achievement measures of individuals and their friends and possible friends are interacted to determine the different preferences of high and lower-achieving adolescents for achievement in their friends. Interactions between respondent achievement and friend achievement are interacted with the racial/ethnic characteristics of the respondent and the friend to determine whether preferences for achievement differ depending on a respondent's race and the friend's race.

4.3. Controls

A wide range of controls are included to account for the characteristics of respondents and their friends that might be correlated with race and academic achievement and might also affect friendship. Unless otherwise noted, the model includes a friend effect of each variable as well as an effect of the interaction between the friend and the respondent. Table 1 includes more detailed descriptions of all variables used in this analysis.

Controls fall into five groups: background characteristics correlated with academic achievement and friendship, school involvement characteristics, network structural characteristics, school characteristics, and opportunities *within* schools to make friends. Background characteristics controlled include gender, parental education, parental occupation, family composition, and immigration history. A friend effect is included for each of these characteristics as well as a dichotomous variable indicating whether the respondent and friend are the same with respect to the background characteristic. For example, the gender of the friend (or possible) friend is included in the model as an indication of whether male students are more likely to be chosen as friends than female students. An additional variable is included to indicate whether the respondent and the friend (or possible friend) are the same gender, indicating whether adolescents are more likely to have friends of the same gender.

School involvement characteristics include several variables measuring involvement in extracurricular activities such as clubs, sports, music, and newspaper/yearbook, as well as composite measures of school attachment and school engagement. These variables are particularly important to control for because they are often highly correlated with achievement in school and help to determine adolescents' contact with others. For example, students involved in sports likely spend significant time at practice and sporting events with their team members. Because of their increased contact, students on the same sports team

⁸Ideally, I would separate respondents and their friends into more fine-grained categories, distinguishing Dominicans and Salvadorans as well. Unfortunately, in the Add Health in-school survey, respondents are allowed to choose from the following Latin origin categories: Mexican/Mexican American, Chicano/Chicana, Cuban, Puerto Rican, Central/South American, other Hispanic.

⁹Actual grades taken from respondents' high school transcripts are available for a subset of the in-school survey respondents from the AHAA study. Unfortunately, because I need to know the academic characteristics of *all* of adolescents' friend options within schools, the transcript measures cannot be used in this analysis. However, the correlation between self-reported grades and transcript grades, for those who have both, is surprisingly high ($r = .8$).

are more likely to be friends with one another. If students on sports teams tend to also be similar with respect to academic achievement, without a control for involvement in sports the impact of achievement on friend preferences will be misspecified. For each of the extracurricular activities, two variables are included in the model, friend involvement and whether the respondent and the friend are both involved in the activity.

Network structure is partially accounted for with measures of reciprocity and transitive ties between respondents and friend alternatives. Structural characteristics of the network, such as reciprocity, balance, and indirect ties, critically shape opportunities for friendship formation and tend to magnify similarities between individuals. Adolescents are more likely to form friendship ties with their friends' friends, for instance. If initial friendships are formed on the basis of similarity in achievement and subsequent friendships are built around the initial friendships, subsequent friends will have similar levels of achievement. Omitting measures of network structure attributes network effects to achievement effects, upwardly biasing estimates of preferences for achievement. Of course, as this analysis is at the dyadic level, it does not account for the full network structures within adolescents' school.

Because this analysis conditions on the respondent, all characteristics that are constant within individuals, including school characteristics are controlled. However, because preferences may vary across school types, I conduct a sensitivity analysis separating the sample by the percent non-White in the school, by the proportion who qualify for free lunch, and by school size.

Finally, two important measures of exposure are included: grade in school and local area position. Local area position is a measure of adolescents' course taking. Created from the AHAA transcript study by Frank and colleagues (2006), local area positions are calculated using course titles from transcripts and are meant to capture a common exposure to both curriculum and peers.¹⁰ Two students in the same local area position are taking a similar set of courses and likely have more contact than two students in different local area positions.¹¹ In contrast to common measures of tracking, this measure does not indicate the level of courses taken; the values assigned to local area positions are arbitrary. This measure is available only for about 12,000 respondents. As I discuss below, when using this measure I restrict the sample to respondents with course-taking information and include flags to indicate when friends and potential friends are missing information on local area position.

Table 1 presents a description of all variables used in this paper. Table 2 presents the means and standard deviations of key variables for the entire sample, by race and ethnicity, and by number of friends nominated (0 vs. non-0).

¹⁰For more information on the creation of the local area positions see Frank et al. (2008), Muller et al. (2007) and Frank et al. (2006).

¹¹Particularly in large schools, there may be multiple sections of one course. As a result, students enrolled in courses with the same titles are not necessarily in the same classroom at the same time. However, because the measure of local area position is developed from an entire schedule rather than one course and there are a limited number of ways that a set of courses can be scheduled. Local area positions provide a good approximation to adolescents' exposure to other students.

4.4. Sample

All respondents missing data on race, gender, academic achievement, grade in school, or school racial/ethnic composition are excluded from the analysis, resulting in a final N of 69,822. All students who do not choose at least one friend within the school are excluded from the study. These respondents remain in the analysis as possible and actual friend choices. Table 2 includes two columns presenting differences between respondents who nominate zero in-school friends and respondents who nominate at least one in-school friend. Those who nominate zero in-school friends have lower self-reported GPAs, are less popular, and less involved in school than those who nominate at least one in-school friend. These differences suggest that if the students who are excluded were to choose friends in school, those friends are more likely to be lower-achieving. Because minority students are overrepresented in the group of excluded respondents, preferences for lower-achieving friends among Black and Latino students are likely somewhat underestimated. If chosen friends or possible friends are missing data, they are recoded to the population mean and a missing data flag is included in the model. All models include sample weights. Standard errors are adjusted to account for non-independence of observations within schools.

5. Results

5.1. Describing the academic characteristics of chosen friends

I begin by describing the differences in the average achievement characteristics of Black, White, and Latino adolescents' nominated in-school friends. Fig. 1 shows the adjusted average proportion of high-achieving friends that adolescents nominate by race/ethnicity and academic achievement.¹² Ignoring different opportunities for nominating high-achieving friends, both Black and Latino students nominate significantly fewer high-achieving friends compared to White students. Although their high-achievement increases the proportion of their friends that are high-achieving, race/ethnicity remains negatively associated with the choice of high-achieving friends. In fact, high-achieving Black adolescents nominate fewer high-achieving friends than lower-achieving White adolescents.

Although this figure hints at possible differences in achievement preferences for friends by race and ethnicity—similar to the findings of Fryer and Torelli (2010)—this simple analysis cannot account for two important trends: (1) the possibility that these patterns are driven by racial/ethnic homophily, and (2) the fact that these adolescents attend different schools and have different opportunities to choose high-achieving friends both within and between schools. If, for example, Black adolescents have a strong preference for same-race friends along with a preference for similarly achieving friends, and Black adolescents are lower-achieving on average, then high-achieving Black adolescents will be less able to realize their preferences because of their limited opportunities.

¹²This figure is based on coefficient estimates from an OLS regression model predicting the proportion of high-achieving friends nominated by respondents. This model controls for the academic achievement, socio-demographic, and behavioral characteristics of respondents and also includes an interaction between respondents' achievement and race. Coefficient estimates are available upon request from the author.

Indeed, the proportion of high-achievers in schools attended by Black, White, and Latino adolescents differ. For example, in the schools Black adolescents in the Add Health sample attend, 18% of students have GPAs over 3.5 while 27% of students in schools White adolescents attend have GPAs over 3.5. Differences across race and ethnicity are even starker if only same-race peers are considered. The average White adolescent attends a school where 30% of the White students have GPAs over 3.5, whereas the average Black adolescent attends a school where only 12% of Black students have GPAs over 3.5. The average Latino student attends a school where only 13% of Latino students have GPAs over 3.5. In other words, even if Black and Latino adolescents had the same preferences for high-achieving friends, they do not have the same opportunities to realize those preferences, particularly if they have strong preferences for same race friends as previous research suggests. Do race and ethnic differences in friendship choices persist after accounting for the opportunity constraints faced by Black and Latino adolescents?

5.2. Preferences for high-achieving friends

Table 3 presents parameter estimates from conditional logit models predicting friendship nominations. Although coefficients are shown only for achievement and race variables, all variables discussed earlier are included in each model. Recall that these models condition on individual respondents. All characteristics that are constant across dyad pairs, including all school characteristics, are controlled. The fact that some students attend schools that are more racially/ethnically segregated than other students, for example, is accounted for.¹³ The model shown here includes interactions between respondent race and achievement, and friend and potential friends' academic achievement. I tested several alternative models including interactions between respondent race/ethnicity and achievement, and friends' achievement and race/ethnicity. The friend race/ethnicity-achievement interaction did not significantly add to the explanatory power of the model.

Coefficients represent the log odds that an individual nominates a friend from a particular race/ethnic group and/or with a particular level of achievement. The reference categories are White and lower-achieving. The first column shows estimates for all respondents, the second includes only the subset of respondents for whom local area positions are available, and the third separates Latino sub-groups again including the full population of respondents. The first and third columns control for the different opportunities across schools to make high and lower achieving friends within and between race/ethnic groups. The second column additionally accounts for whether the respondent and possible friend share a local area position. Given that adolescents' opportunities to choose friends are controlled, the coefficients from these models represent adolescents' preferences for friends with particular race and achievement characteristics.¹⁴

Focusing on the first column of Table 3, two patterns are clear: (1) adolescents are more likely to nominate same-race/ethnicity friends than different race/ethnicity friends

¹³These models do not account for *interactions* between school level characteristics and preferences for friends with particular characteristics. For example, these models do not account for the possibility that preferences for high-achieving friends vary depending on the race/ethnic composition of schools.

¹⁴As I mention earlier, I also assume that academic achievement is not affected by friendships. If adolescents influence one another to be more similar on academic achievement, then estimates of preferences for similarity in achievement are over-estimated.

(coefficients 15 and 20, C15 and C20 from here on), and (2) adolescents are more likely to nominate friends with similar levels of achievement than they are to cross achievement levels (C1 and C2). The odds that a Black student nominates a Black friend are more than 5 times the odds that he/she nominates a White friend (C11 and C15: $e^{(-1.011+2.687)}$ and two times the odds that he/she nominates a Latino friend (C11, C12, C15, C16: $e^{((-1.011+2.687)-(-.258+1.198))}$). A similar pattern of race/ethnic homophily occurs among Latino and White adolescents.

Achievement homophily is also strong. A White student with a GPA less than 3.5 has odds 11% lower of nominating a friend with a GPA greater than or equal to 3.5 compared to a friend whose GPA is also less than 3.5 (C1: $e^{-0.124}$). By contrast a White high-achiever has odds 1.5 times greater of nominating a high-achieving friend compared to a friend with a GPA less than 3.5 (C1 and C2: $e^{-0.124+0.570}$). Similar patterns of achievement homophily occur among Black and Latino adolescents. For example, high-achieving Black adolescents have odds 1.3 times greater of nominating a high-achieving friend compared to a lower-achieving friend (C1, C2, C3: $e^{(-0.124+0.570-0.017)}$). High-achieving Latino adolescents have odds 1.47 times their odds of nominating a lower-achieving friend (C1, C2, C4: $e^{(-0.124+0.570-0.078)}$).

The motivating question of this study is: after opportunities are controlled, do Black and Latino adolescents have different achievement preferences for friends compared to Whites? Table 4 calculates the log odds of nominating a friend with a GPA greater than or equal to 3.5 compared to a friend with a GPA less than 3.5 across race and achievement categories. The bottom of the table shows results from significance tests testing for differences across groups at the $p < .05$ significance level.

Controlling for racial/ethnic homophily, there are no significant differences in the odds that lower-achieving White, Black and Latino adolescents nominate high-achieving friends. All groups are less likely to nominate a high-achieving friend compared to a lower-achieving friend, but *equally* less likely. For example, the odds that a lower-achieving White adolescent nominates a high-achieving friend are 12% lower compared to their odds of nominating a lower-achieving friend ($e^{-.124}$), while lower-achieving Black adolescents have odds 13% lower ($e^{-.141}$) and Latinos 18% lower ($e^{-.202}$). Although each group is significantly less likely to nominate high-achieving friends compared to lower-achieving friends, their odds do not differ significantly from one another.

Among high-achievers, although White and Latino students do not differ significantly in their odds of nominating high-achieving friends, Black adolescents do. High-achieving Black students have odds 31% greater of nominating a high-achieving friend compared to a lower-achieving friend ($e^{0.272}$) whereas White and Latino high-achieving adolescents have odds 46% ($e^{0.446}$) and 56% ($e^{0.385}$) greater, respectively. High-achieving Black students' odds of choosing a high-achieving friend are significantly lower than both White and Latino students' odds, even after accounting for the different friend options available to them across schools.

Even accounting for race/ethnic homophily, achievement homophily, and differences in opportunities to nominate high-achieving friends, differences in the achievement characteristics of nominated friends continue to persist among high-achieving Black adolescents. Does accounting for differences in the course-taking patterns by race and ethnicity eliminate the estimated difference in friend nominations among Black and White high-achieving adolescents?

The second columns of Tables 3 and 4 present these results. After controlling for whether the respondent and possible friend are in the same local area position, the Black–White difference among high-achievers in the likelihood of nominating a high-achieving friend disappears. Focusing on the second column of Table 4, the odds that a White student nominates a high-achieving friend are 56% greater than the odds that she nominates a lower-achieving friend ($e^{0.442}$). Among high-achieving Black students and high-achieving Latino students their odds are 49% ($e^{0.339}$) and 53% ($e^{0.424}$) greater respectively. The differences between their odds of nominating a high-achieving friend, compared to a lower-achieving friend are not statistically different at the $p < .05$ level. In other words, after controlling for course-taking patterns as well as opportunities and racial/ethnic homophily, high-achieving White, Black and, Latino adolescents are equally likely to nominate a high-achieving friend.

These results provide some evidence that an oppositional culture does not exist within the larger Black and Latino populations. However, theory suggests that different Latino origin groups should be more and less susceptible to the forces of an oppositional culture. In particular, Mexican and Puerto Rican origin adolescents should be more vulnerable to an oppositional culture.

I repeat the analysis with the full sample, separating Puerto Rican and Mexican origin groups from other Latino adolescents. These results are shown in column 3 of Tables 3 and 4. Among lower-achieving Mexican and Puerto Rican adolescents, their odds of nominating a high-achieving friend compared to a lower-achieving friend are not significantly different from those of lower-achieving White adolescents (C5). Although this population prefers lower-achieving to higher-achieving friends (C1), this preference does not differ from Whites' nor does it differ significantly from other Latino adolescents' (C6). High-achieving Mexican/Puerto Rican adolescents similarly do not differ significantly from White adolescents in their preference for high-achieving friends (C9). Nor do they differ significantly from other Latino origin high-achieving adolescents. These patterns are made clearer in Table 4. Lower-achieving Mexican/Puerto Rican adolescents have odds 17% lower of nominating a high-achieving friend compared to a lower-achieving friend ($e^{-0.185}$). By comparison, White adolescents have odds 12% lower of nominating a high-achieving friend compared to a lower-achieving friend ($e^{-0.124}$). Again, this difference is not statistically significant at the $p < .05$ level. Among high-achievers, White students' odds of nominating a high-achieving friend are 1.56 times those of nominating a lower-achieving friend ($e^{0.446}$), while they are 1.51 times for Mexican/Puerto Rican adolescents ($e^{0.414}$) and 1.41 times for other Latino groups ($e^{0.346}$). According to significance tests (summarized at the bottom of Table 4), these small differences in the odds of nominating high vs. lower-achieving friends are not statistically different from 0.

Overall, although there are important differences among populations of Latinos in the US, these differences do not significantly impact their achievement preferences for friends.¹⁵

5.3. Predicted probabilities in three hypothetical populations

Above I show that only minimal race and ethnic differences in nominations of high-achieving friends remain once opportunities and homophily are controlled. No differences across race/ethnicity in nominations of high-achievers exist after course-taking exposure is controlled. To what extent are the differences from part 1 driven by different opportunity structures?

I answer this question by imagining three hypothetical populations who only choose same-race friends.¹⁶ The first is a population of adolescents who only vary in their levels of achievement and race/ethnicity. In this population, there are equal numbers of high-achieving White, Black, and Latino adolescents. In other words, all adolescents have the same opportunities to make high and lower-achieving friends and have an *equal* opportunity of making high and lower-achieving friends. The second population is identical to the first except that high-achievement is rarer. In contrast to population 1, only 30% of adolescents have a GPA greater than or equal to 3.5. This is the experience of the typical White adolescent in the real world. However, unlike the real world, 30% of *each* race and ethnic group is high-achieving. Again, all adolescents have the same opportunities to make high and lower-achieving friends. Finally, the third population varies the proportion of high-achieving adolescents by race and ethnicity. Mirroring the real world, 30% of White adolescents are high-achieving while 12% of Black and 13% of Latino adolescents are high-achieving. The result is that students' opportunities for making high-achieving friends vary by race and ethnicity.¹⁷

What are the predicted probabilities of nominating a high-achieving friend given these three different opportunity structures?

Table 5 presents these probabilities calculated from the coefficient estimates from the LAP model presented in Tables 3 and 4. These predicted probabilities underscore the importance of opportunities to adolescents' friendship choices. In the first column all race and ethnic groups have the same opportunities to choose high and lower-achieving friends and high and lower-achievers are equally represented in the population. The predicted probability that a White lower-achiever nominates a high-achieving friend is .47 while Black and Latino probabilities are .49 and .48 respectively. The probability of nominating a high-achieving

¹⁵Sensitivity analyses were conducted among the following sub-populations: boys, girls, high poverty schools (proportion free lunch greater than 50%), low minority schools (70–100% White), high minority schools (0–25% White), and large schools (776 or more students). Results were surprisingly consistent across these sub-populations. There were of course a few exceptions. In schools with large percentages of free lunch students, all students, regardless of race and achievement level, were more likely to nominate high-achieving friends compared to lower-achieving friend. In schools with small minority populations, lower-achieving Black students are significantly more likely to choose a friend with a GPA less than 3.5 compared to lower achieving White students.

¹⁶Obviously in the real world, not all friendships are same-race friendships. This exercise is meant merely to demonstrate how changes in opportunities can vastly change the probabilities that different types of friends are chosen when preferences remain the same.

¹⁷Another way to think about this exercise is to imagine that White, Black, and Latino students attend different schools. They can choose a friend from any race or ethnic background within their schools but the achievement compositions of the schools they attend vary.

friend is somewhat higher among high-achievers. White, Black, and Latino students in this population all have approximately a .6 probability of choosing a friend with a GPA greater than or equal to 3.5. Overall, race and ethnic differences in probabilities are noise and choosing a high-achieving friend is common, even among lower-achievers.

The White opportunities column complicates the story by creating a scarcity of high-achieving possible friends. This scarcity diminishes the probability that anyone chooses a high-achieving friend but because opportunities are reduced equally across race and ethnic groups, there are still only negligible differences in probabilities across race and ethnic groups within achievement categories. Among lower-achievers, all race/ethnic groups have a .28/.29 probability of nominating a high-achieving friend. Among high-achievers, the probability of nominating a high-achieving friend is reduced to about .4 but again this probability is constant across race/ethnic groups.

Finally, the unequal opportunities column assumes completely different opportunity structures for White, Black, and Latino adolescents, with White students having the most opportunities to choose a high-achieving friend and Black students having the fewest opportunities. Remember that the preferences of all students remain constant. Among both lower and high-achievers, Black and Latino adolescents have dramatically lower probabilities of nominating high-achieving friends compared to White adolescents in this hypothetical population. Whereas lower-achieving Whites have a .28 probability of nominating a high-achieving friend, lower-achieving Black and Latinos have only a .12 probability of nominating a high-achieving friend. The race/ethnic difference is even more dramatic among high-achievers. High-achieving Black and Latino adolescents have a .17 and .19 probability of nominating a high-achieving friend respectively while high-achieving White adolescents have a .40 probability of nominating a high-achieving friend. In fact, lower-achieving White adolescents are more likely to nominate a high-achieving friend than high-achieving Black or Latino adolescents in this hypothetical population. This result is the consequence of limited opportunities to choose high-achieving friends among Black and Latino students. Indeed, this is the only difference between the hypothetical populations in columns 2 and 3. In other words, even with the same preferences different opportunities result in dramatically different probabilities of choosing high-achieving friends. This result suggests that the race and ethnic differences in achievement profiles of adolescents' friends are driven, in large part, by differences in the opportunities that Black, White, and Latino adolescents have to choose high-achieving friends.

6. Discussion

The goal of this paper was to describe the achievement characteristics of friends after accounting for race and ethnic differences in opportunities to nominate high-achieving friends. Although Black and Latino adolescents' friends are less likely to be high-achieving compared to White adolescents' friends, differences in opportunities to make high-achieving friends both within and between schools account for much of this pattern. With equal opportunities to nominate high-achieving friends, White, Black, and Latino adolescents would have relatively similar probabilities of nominating high-achieving friends. If

opportunities vary by race and ethnicity, differences in probabilities emerge and grow as opportunities between groups diverge.

These results, of course, depend on several important assumptions. The first is that academic achievement is exogenous to friendship. In other words, I assume that any patterns of similarity or difference among friends are the result of selection and not influence. Because of the cross-sectional nature of the data used for this analysis, I cannot distinguish between selection and influence. As a result, the estimated odds of nominating friends with similar levels of achievement are likely overestimated. However, this over-estimation will only affect the substantive results of this study if levels of influence differ across race and ethnicity. Oppositional culture theory suggests that Black and Latino adolescents will not only be more likely to select lower-achieving friends but also be more strongly negatively influenced by their peers. Whether the result of selection or influence however, this analysis shows that White, Black, and Latino adolescent's friends' achievement does not differ once opportunities are controlled.

Second, this analysis is based exclusively on in-school friendships, ignoring the role that out-of-school friendships may play in adolescents' lives. Although for most adolescents, school is the focus of their social lives, for those most vulnerable to an oppositional culture, it may be the neighborhood friends, outside of school, who are most influential. To the extent that the characteristics of their in-school friends mirror those of their out-of-school friends, this exclusion should not affect results. However, if these kids have no in-school friends, they were excluded from the analysis and I have potentially underestimated preferences for lower-achieving friends. Only with systematic data on adolescents' in- and out-of-school friends, can this question be answered.

Finally, this analysis does not find any evidence to suggest that an oppositional culture exists based on adolescents' friend nominations. However, oppositional culture may manifest itself in other ways. For example, Black students may feel pressure from their Black peers to not "act white," particularly when around lower-achieving friends. In order to maintain their high achievement, they adopt strategies to manage both their image and their achievement. They adapt their speech, dress, and behaviors around certain groups of friends to avoid being perceived as "acting white" (Horvat and Lewis, 2003). However, rather than affecting achievement or friendship groups, these strategies help adolescent to *maintain* them.

In contrast to predictions of oppositional culture theory, race and ethnic differences in the achievement characteristics of friends are driven, in large part, by differences in opportunity structures both within and between schools to nominate high-achieving friends. If friends provide norms, resources, and support to adolescents, then the achievement characteristics of one's friends could have important impacts on current and future academic achievement and educational attainment. It is not the preferences of Black and Latino adolescents that are leading to their lower-achieving friends, it is their opportunities to choose friends. The racial/ethnic and economic segregation of schools and tracking schemes within schools, disadvantage the already disadvantaged by shaping their opportunities to choose friends.

Race/ethnic disparities in achievement however, will not be eliminated by merely changing the opportunity structures of adolescents. Friendship opportunity structures within and between schools make up only a small piece of the more complicated story of race and ethnic disadvantage in education in the US. The next step is to understand how and where opportunity structures fit in with differences in school quality, family resources, and neighborhood resources, among other things, to affect race and ethnic disparities in academic achievement and attainment.

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Fig. 1.

Predicted proportion of friends with GPA ≥ 3.5 by race/ethnicity and academic achievement.

Note: Proportions are adjusted to account for differences in gender, parental education, immigration history, school engagement, school attachment, participation in school clubs, music and sports, urbanicity, region, school % non-white, school size, school type, proportion free lunch, and number of nominated friends. Proportions are calculated with all controls set to their population means.

Table 1

Description of variables used in analysis.

Variable	Description
<i>Academic achievement</i>	
GPA	Student-reported average grade in english, math, science, and social studies, in the most recent grading period. Students report letter grades A, B, C, or D or lower. Letter grades are assigned 4, 3, 2, and 1 points respectively and averaged across subjects
High GPA	Dichotomous variable indicating whether the respondent's GPA ≥ 3.5
Race	White, Black, Latino, Asian/Pacific Islander, other. Latino category includes all Latino students regardless of reported race. Alternative measure separates Mexican and Puerto Rican origin adolescents from other Latino respondents
<i>Controls</i>	
Gender	Male = 1, Female = 0
Mother BA	Dichotomous variable indicating whether mother has at least a bachelor's degree, from student report of mother's education
Father BA	Dichotomous variable indicating whether father has at least a bachelor's degree, from student report of father's education
Professional parent	Student-reported parent's occupation category. Coded as 1 if either parent worked in a professional occupation including Professional 1 (i.e. doctor, lawyer, scientist), professional 2 (i.e. teacher, librarian, nurse), and Manager (i.e. executive, director)
Two parent family	Student report of whether he/she lived with their two married biological parents or whether they had any other family type, including single parent families and step-families
Foreign born	Student report of whether he/she was born outside of the United States
Second generation immigrant	Student report of whether his/her mother/father was born outside of the United States. Student is classified as a second generation immigrant if either parent was born outside of the United States
Region	Series of dichotomous variables indicating the region of the country the respondent lives in: West, East, Midwest, South
<i>Extra-curricular activities</i>	
Club	Dichotomous variable indicating whether the respondent participated in any of the following school clubs: (1) French club, (2) German club, (3) Latin club, (4) Spanish club, (5) Book club, (6) Computer club, (7) Drama club, (8) Future Farmers of America, (9) History club, (10) Math club, (11) Science club, (12) Other club or organization
Music	Dichotomous variable indicating whether the respondent participated in any of the following school music programs: (1) Band, (2) Chorus or choir, (3) Orchestra
Sports	Dichotomous variable indicating whether the respondent participated in any of the following school sports teams: (1) Cheerleading/dance team, (2) Baseball/softball, (3) Basketball, (4) Field hockey, (5) Football, (6) Ice hockey, (7) Soccer, (8) Swimming, (9) Tennis, (10) Track, (11) Volleyball, (12) Wrestling, (13) Other sport
Other extra curriculars	Dichotomous variable indicating whether the respondent participated in student government, newspaper, or yearbook
School attachment	The average of students' responses to the following three questions: how many times have you skipped school for the full day without an excuse, how often have you had trouble paying attention in school, and how often have you had trouble getting homework done. Skipping school is coded into the following categories: 0 = 0, 1 = 1-2, 2 = 3-5, 3 = 6-9, 4 = 10 or more. The other two items range from 0-4. All items were reverse coded before

Variable	Description
	averaging so that a high score means greater school engagement than a low score
School engagement	The average of students' responses to three questions asking how much they agree with the following statements: you feel close to people at your school, you feel like you are a part of your school, you feel happy to be at your school. Each question ranges from 1-strongly agree to 5-strongly disagree. All items were reverse coded so that a high score means greater school attachment than a low score
<i>Network measures</i>	
Reciprocity	Dichotomous variable indicating whether the friend or possible friend nominates the respondent as a friend
Transitivity	Dichotomous variable indicating whether the friend or possible friend nominates at least one friend in common with the respondent
<i>School measures</i>	
High minority	0–25% of students attending the school are non-white
Low minority	85–100% of students attending the school are white
Urbanicity	Series of dichotomous variables from school survey: rural, suburban, and urban
Proportion free lunch	From the Common Core of Data (CCD), the proportion of students enrolled in the school who qualify for free lunch. Because these data are from the CCD which includes only the population of public schools, this measure is available only for the public schools in the sample
Public school	Dichotomous variable indicating whether the school is a public school vs. a private school. Private school includes both parochial and non-parochial schools
School size	From school survey, number of students enrolled in the school
<i>Proximity measures</i>	
Same grade	Includes grades 7, 8, 9, 10, 11, and 12
Same local area position (LAP)	Measure of course-taking patterns from AHAA network variables. Number values are meaningless and used to determine only if two respondents take the same general set of courses

Table 2

Descriptive characteristics of selected variables by race/ethnicity and number of friends, Add Health 1995.

Selected variables	All respondents	White	Black	Latino	Puerto Rican/Mexican	Other Latino	>0 Friends	0 Friends
<i>Achievement</i>								
GPA	2.81	2.9	2.58	2.61	2.63	2.58	2.83	2.68
High-achieving	0.28	0.32	0.15	0.18	0.20	0.17	0.29	0.23
<i>Race/ethnicity</i>								
White	0.59	1.00					0.62	0.44
Black	0.16		1.00				0.15	0.22
Latino	0.13			1.00	1.00	1.00	0.12	0.20
Puerto Rican/Mexican	0.07			0.53	1.00		0.06	0.10
Other Latino	0.06			0.47		1.00	0.06	0.10
<i>Friends</i>								
Popularity (in-degree)	3.82	4.1	3.38	2.83	2.91	2.74	4.37	0.31
Same-race popularity	2.76	3.11	2.47	1.16	1.37	0.94	3.16	0.21
Out-degree	5.78	6.06	5.22	4.96	5.07	4.82	6.68	0.00
<i>School involvement</i>								
Attachment	3.56	3.59	3.44	3.53	2.91	3.01	3.35	2.77
Engagement	2.63	2.67	2.58	2.44	2.26	2.29	2.60	2.28
Club	0.37	0.38	0.34	0.33	0.33	0.34	0.38	0.26
Sports team	0.57	0.58	0.59	0.51	0.50	0.52	0.59	0.49
Music	0.22	0.23	0.23	0.14	0.13	0.15	0.23	0.13
Std. gov/newspaper/yrbook	0.17	0.17	0.17	0.15	0.14	0.15	0.17	0.11
<i>School characteristics</i>								
Proportion free lunch ^a	0.28	0.23	0.45	0.34	0.34	0.35	0.28	0.30
Proportion white	0.58	0.69	0.3	0.42	0.43	0.40	0.60	0.49
0–25% white	0.24	0.05	0.55	0.40	0.37	0.45	0.20	0.31
<i>N</i>	69,822	48,314	10,307	11,201	5723	5467	59,392	10,430

^aProportion free lunch only available for public schools who participated in the common core of data, *N* = 52,693.

Table 3

Conditional logit model predicting the log odds of nominating a friend, Add Health 1995.

Selected independent variables		All schools	Local area position sample	Latino categories
<i>Achievement</i>				
1	Friend High GPA	-0.124 (0.017)	-0.103** (0.039)	-0.124** (0.017)
2	High GPA × Friend High GPA	0.570* (0.022)	0.545** (0.060)	0.570** (0.022)
<i>Race/achievement interaction</i>				
3	Black × Friend High GPA	-0.017 (0.045)	0.055 (0.080)	-0.013 (0.046)
4	Latino × Friend High GPA	-0.078 (0.041)	0.028 (0.144)	
5	Mexican/Puerto Rican × Friend High GPA			-0.060 (0.052)
6	Other Latino × Friend High GPA			-0.098 (0.062)
7	Black × High GPA × Friend High GPA	-0.157** (0.058)	-0.098 (0.183)	-0.157** (0.059)
8	Latino × High GPA × Friend High GPA	0.017 (0.080)	-0.047 (0.240)	
9	Mexican/Puerto Rican × High GPA × Friend High GPA			0.029 (0.093)
10	Other Latino × High GPA × Friend High GPA			-0.002 (0.098)
<i>Race/ethnicity</i>				
11	Black friend	-1.011** (0.092)	-1.056** (0.187)	-1.011** (0.092)
12	Latino friend	-0.258** (0.046)	-0.269** (0.085)	
13	Mexican or Puerto Rican Friend			-0.304** (0.065)
14	Other Latino Origin Friend			-0.213** (0.044)
15	Black × Black friend	2.687** (0.176)	2.902** (0.281)	2.694** (0.176)
16	Black × Latino friend	1.198** (0.127)	1.432** (0.204)	
17	Black × Mexican/Puerto Rican Friend			0.806** (0.116)
18	Black × Other Latino friend			1.401** (0.132)
19	Latino × Black friend	0.965** (0.138)	0.886** (0.265)	
20	Latino × Latino friend	1.014** (0.085)	0.981** (0.148)	
21	Mexican/Puerto Rican × Mex/PR Friend			1.303** (0.120)

Selected independent variables		All schools	Local area position sample	Latino categories
22	Mexican/Puerto Rican × Other Latino friend			0.722** (0.081)
23	Mexican/Puerto Rican × Black Friend			0.706** (0.155)
24	Other Latino × Other Latino friend			0.837** (0.112)
25	Other Latino × Mexican/Puerto Rican Friend			0.743** (0.104)
26	Other Latino × Black Friend			1.159** (0.142)
Log pseudolikelihood		−140,800,000	−14,736,751	−140,700,000
Pseudo R^2		0.283	0.307	0.284
Number of Dyads		4,471,114	406,286	4,471,114

Robust standard errors clustered by school are reported in parentheses below coefficient estimates. All models include controls for transitivity, reciprocity, friend alternative's grade, gender, parental education, immigration history, school engagement, school attachment, participation in school clubs, music, and sports, and whether the friend alternative and respondent have the same value for all preceding characteristics. LAP only includes a control for whether the respondent and the friend alternative are in the same local area position in school.

*
 $p < .05$.

**
 $p < .01$.

Table 4

Log odds of nominating a friend with GPA ≥ 3.5 compared to nominating a friend with GPA < 3.5 from Table 3 estimates, Add Health 1995.

R's Race and Achievement	Friend GPA ≥ 3.5		
	All schools	LAP only	Latino categories
<i>GPA < 3.5</i>			
White	-0.124** (0.017)	-0.103** (0.039)	-0.124** (0.017)
Black	-0.141** (0.042)	-0.048 (0.070)	-0.138** (0.042)
Latino	-0.202** (0.039)	-0.075 (0.140)	
Mexican/Puerto Rican			-0.185** (0.049)
Other Latino			-0.222** (0.062)
<i>GPA ≥ 3.5</i>			
White	0.446** (0.019)	0.442** (0.047)	0.446** (0.019)
Black	0.272** (0.054)	0.399** (0.141)	0.275** (0.055)
Latino	0.385** (0.072)	0.424* (0.182)	
Mexican/Puerto Rican			0.414** (0.092)
Other Latino			0.346** (0.076)
<i>Significant differences among GPA < 3.5?</i>			
White-Black	No	No	No
White-Latino	No	No	
Latino-Black	No	No	
White-Mexican/Puerto Rican			No
White-Other Latino			No
Mexican/Puerto Rican-Black			No
Mexican/Puerto Rican-Other Latino			No
Other Latino-Black			No
<i>Significant differences among GPA ≥ 3.5?</i>			
White-Black	Yes	No	Yes
White-Latino	No	No	
Latino-Black	No	No	
White-Mexican/Puerto Rican			No
White-Other Latino			No
Mexican/Puerto Rican-Black			No
Mexican/Puerto Rican-Other Latino			No
Other Latino-Black			No

Robust standard errors clustered by school are reported in parentheses below coefficient estimates. Calculated from results in Table 3.

*
 $p < .05$.

**
 $p < .01$.

Table 5

Predicted probability that nominated friend has a GPA ≥ 3.5 by race and achievement, three hypothetical populations.

	Equal opportunities	White opportunities	Unequal opportunities
<i>GPA < 3.5</i>			
White	0.47	0.28	0.28
Black	0.49	0.29	0.12
Latino	0.48	0.28	0.12
<i>GPA ≥ 3.5</i>			
White	0.61	0.40	0.40
Black	0.60	0.39	0.17
Latino	0.60	0.40	0.19

Notes: Equal opportunities—50% of possible friends have GPAs ≥ 3.5 for all race/ethnic groups. White opportunities—30% of possible friends have GPAs ≥ 3.5 for all race/ethnic groups. Unequal opportunities—30% of white possible friends, 13% of Latino possible friends, and 12% of Black possible friends have GPAs ≥ 3.5 .