Is it Always Better to Have Friends in High Places?
Effects of Friends' Socioeconomic Status on Future College Attendance among Youth

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Abstract

Using the National Longitudinal Study of Adolescent Health (Add Health), a nationally-representative sample of seventh to twelfth graders in 1994-95, we examine how best friends' socioeconomic status affects students' odds of attending college seven years later, and how these effects vary with students' social class. We introduce and evaluate three hypotheses. First, the **booster hypothesis** suggests that high-SES best friends are beneficial regardless of students' own social class. Second, the **homophily hypothesis** posits that same-SES best friends are most beneficial to students' educational attainment. Finally, the **heterophily hypothesis** predicts that cross-class friendships produce the best outcomes. After accounting for the characteristics of respondents and their best friends, we find that low- and mid-SES students benefit most from having high-SES best friends, while high-SES students benefit most from having mid-SES best friends. Low-SES best friends, on the other hand, reduce educational attainment regardless of students' own SES. Having no best friend is particular detrimental for low-SES students, while High-SES students are better off having no best friend than having a low-SES best friend. Overall, our results provide partial support for the **booster hypothesis**, but also suggest that friends' characteristics interact to produce outcomes. Finally, because low-SES students derive the greatest relative benefit from high-SES best friends but are also least likely to have them, our results also indicate that friendship patterns in American schools may contribute to class-based gaps in educational outcomes.

Introduction

Research consistently shows that socioeconomic status (SES) is the strongest predictor of educational achievement, aspirations, and attainment (Coleman et al. 1966; Coleman 1988; Brooks-Gunn & Duncan 1997). Numerous studies also demonstrate that the SES of students' classmates has a similar (albeit weaker) positive effect on educational outcomes (see, for example: Alexander & Campbell 1964; Mayer 1970; Alwin & Otto 1977; Alexander et al. 1979; Bryk, Lee, & Smith 1990; Opdenakker & Van Damme 2001). While a large body of research attempts to explain why SES is so critical for academic success (for a thorough review of research on status attainment, see Lin 1999), we have only a limited understanding of the mechanisms by which peer SES affects student outcomes (Caldas & Bankston 1997).

In attempting to explain these peer effects, researchers often point to the importance of cultural capital and social capital. Specifically, the cultural capital model suggests that early experiences allow individuals to develop cultural tools conducive to achievement. Similarly, the social capital theory argues that social networks provide access to resources, and that individuals can invest or utilize these resources in attempting to achieve specific goals (Bourdieu [1977] 2001; Coleman 1988; Lin 1999). Scholars most frequently apply these social and cultural capital models to describe parental effects, but peers and the social and cultural capital they provide are also crucial in affecting academic outcomes.

And yet, this kind of capital transfer seems most likely to occur in close relationships, such as those formed with best friends. For example, a low-SES student with a high-SES best friend could receive some of the social and cultural capital benefits that the high-SES student gains from his parents. If this is the case, then it might explain why peer SES composition positively affects student's outcomes by increasing his likelihood of having a high-SES best friend.

Some recent research suggests that homophilous peer environments (i.e., those with high concentrations of students with similar characteristics) may be most beneficial for student outcomes (Hoxby & Weingarth 2005). And yet, this research investigates only the effects of aggregate peer characteristics on students' academic achievement gains, and does not examine how the characteristics of specific peers (i.e., best friends) influence student outcomes. Thus, it is possible that a low-income student might benefit more from having a low-SES best friend (who accepts her and shares his values and experiences) than from having a high-SES best friend (to whom she may feel he will never compare).

Hence, our paper examines how the SES of a student's high school or middle school best friend affects the student's likelihood of attending a four-year college after high school. In doing so, we test three different hypotheses regarding the ways in which peer characteristics affect educational outcomes. The first of these, which we call the *booster thesis*, suggests that all students will benefit from access to higher-SES peers, regardless of their own SES. Second, the *homophily thesis* posits that students will benefit most from exposure to and interaction with peers from similar SES backgrounds. Finally, the *heterophily thesis* predicts that cross-class friendships are most beneficial for student outcomes. We evaluate these three hypotheses using data from the National Longitudinal Study of Adolescent Health (Add Health).

Limitations of Existing Research on Peer Effects

Most existing research on peer effects examines the impact of peer characteristics at the school or classroom level, and not at the level of best friend interactions. This is largely because few studies collect information about students' friendships or friend characteristics. Hallinan and Williams (1990) criticize existing research for relying "primarily on theories of reference-group

processes to explain peer influence" without accounting for the friendship relations on which such peer influences might rest (122).

And yet, even those studies that do utilize existing information on friendships often focus on friends' influence on delinquent behavior (Hunter, Vizelberg, & Berenson 1991; Urberg et al. 1997; Bearman & Bruckner 1999, 2001; Jaccard, Blanton, & Dodge 2005) rather than on school outcomes. This lack of research is problematic in that small-sample studies show that friends are far more influential than larger peer groups in shaping adolescents' choices and behavior (Urberg 1992). If this is also the case for educational choices and behavior, then research into peer influences on educational outcomes should focus more on friends than on peer group traits. Hanushek et al. (2003) recognize that "there has been limited attention given to the mechanisms through which peers affect outcomes" (529), and suggest that school- or grade-level aggregations alone are insufficient to truly capture the nature of peer influence. Such aggregations also limit research into the possibility that certain peers or peer relationships (i.e., friends, classmates, etc.) may be more influential than others in shaping a particular student's outcomes.

While a few studies do examine the influence of friends (and not school- or grade-level peer groups), Davies and Kandel (1981) criticize them for relying on adolescents' reports of peer attitudes and characteristics rather than on peers' self-reports. In doing so, these studies muddy the distinction between perception and influence. A respondent in one of these studies may simply assume that his best friend shares his own aspirations, even if this is not actually the case.

Research on peer and friend influences on educational outcomes is also limited by its reliance on shorter-term outcome measures like achievement or aspirations. Related studies that utilize the same data we use here have examined the effect of friends on short-term outcomes like adolescent cigarette smoking (Alexander et al. 2001) and academic achievement at Wave I

(Duncan et al. 2001), but they do not consider the longer term consequences of friendship formed earlier in life nor how SES of friends matter.

Most studies do not follow students over time, particularly beyond graduation from high school, thus making it difficult to posit causal arguments about peer influence. In other words, focusing on short-term outcomes is problematic in that friend and peer influences are reciprocal, making it difficult to determine the directionality of these peer effects and to separate them from "other confounding influences" (Hanushek et al. 2003: 527). Thus, only with lagged outcome measures can we locate the true and independent effects of peer or friend characteristics.

Despite its flaws, existing research on peer effects generally shows that students benefit from access to peers with higher achievement, higher aspirations, and even higher socioeconomic status (Haller & Butterworth 1960; Alexander & Campbell 1964; McDill & Coleman 1965; Duncan, Haller, & Portes1968; Hanushek et al. 2003). One recent study demonstrates, however, that students benefit more from access to peers with similar levels of initial achievement than from exposure to those with high levels of achievement (Hoxby & Weingarth 2005). Finally, research on the racial composition of friendships indicates that cross-racial friendships have a positive impact on student outcomes (Hallinan & Williams 1990; Joyner & Kao 2000), suggesting that this may also be the case for cross-class friendships. While these studies do not speak directly to the impact of a best friend's SES on a student's likelihood of college attendance, they do provide support for three different and competing hypotheses regarding the ways in which peers influence student outcomes.

The Booster Thesis:

The vast majority of research on peer effects supports what we will call the *booster thesis*, which suggests that all students benefit from access to high-SES peers and, more specifically,

from having a high-SES best friend. Thus, this model predicts that students with high-SES best friends will have higher college attendance rates than do students with lower-SES friends, regardless of their own socioeconomic background.

Existing research on peer effects generally shows that school-level aggregations of peer group characteristics like ability, achievement, and even socioeconomic status have linear, positive effects on student outcomes (Haller & Butterworth 1960; Alexander & Campbell 1964; Hallinan & Williams 1990; Hanushek et al. 2003). More specifically, these studies show that peer characteristics shape students' educational attitudes and aspirations, which, in turn, affect longer-term outcomes like educational achievement and attainment (Woelfel & Haller 1971; Hout & Morgan 1975; Buchmann & Dalton 2002). Overall, these studies support the booster thesis in showing that all students, regardless of their own achievement or SES, benefit from access to higher-achieving and higher-SES peers. As we suggest above, however, there are a number of problems with existing research on peer effects. Most of these studies do not account for the reciprocal nature of peer effects, and many fail to control for other variables that may create similarity between students and their peers.

To overcome these problems, Hanushek et al. (2003) use lagged measures to examine how different peer achievement contexts affect students' achievement gains. In doing so, they find that students in schools with higher-achieving peers exhibit greater achievement gains than do those attending schools with lower-achieving peers, regardless of their own initial achievement level. Their findings thus confirm those of earlier (but methodologically flawed) studies, suggesting that peer achievement does have a uniform, positive effect on all students.

The Homophily Thesis:

Other studies support the *homophily thesis*, which suggests that students benefit most from having best friends with similar characteristics (for discussions of friendship homophily, see Shrum, Cheek, & Hunter 1988 and McPherson, Smith-Lovin, & Cook 2001). Like the booster thesis, the homophily thesis posits that high-SES students with high-SES best friends will have higher odds of college attendance than high-SES peers with lower-SES friends. For low-SES students, however, the homophily thesis predicts that they will benefit most from having low-SES—not high-SES—best friends. In other words, the booster and homophily thesis differs primarily in their expectations regarding low-SES students.

While the homophily thesis has not been tested with respect to social class, there is evidence that students have better outcomes in academically homophilous peer groups. Hoxby and Weingarth (2005) demonstrate, for example, that achievement gains are greatest when elementary students are reassigned to classrooms comprised predominantly of peers with similar initial levels of achievement. This supports the homophily thesis in suggesting that students may benefit most from access best friends with similar characteristics.

The Heterophily Thesis

Finally, research on cross-racial friendships supports the *heterophily thesis*, which suggests that cross-class friendships (i.e., those between high- and low-SES students) bolster the educational attainment of both high- and low-SES students. Thus, this thesis posits that high-SES students with low-SES best friends will have higher college attendance rates than high-SES students with high-SES best friends, and that low-SES students with high-SES best friends will be more likely than low-SES students with low-SES best friends to attend a four-year college. This hypothesis follows some of the findings regarding the benefits of interracial friendships.

Hallinan and Williams (1990) find that interracial friendships positively influence the aspirations of black and white children. In light of these and other similar findings (Joyner & Kao 2000), it seems possible that cross-class friendships may also have a mutually beneficial impact on the college aspirations and attendance of both high- and low-SES students.

Peer SES Effects on Student Outcomes

Research on the relationship between SES and friendship is extremely limited, and what little we do know focuses predominantly on SES as a factor in friendship (McPherson et al. 2001) and marriage formation (Haller 1981). Such research is even rarer among children: the one existing study that specifically examines cross-class friendship formation includes only adult respondents (Wright & Cho 1992).

There is, however, a large body of research examining the impact of school socioeconomic composition on student outcomes (Wilson 1959; Michael 1961; Alexander & Campbell 1964; Alwin & Otto 1977; Alexander et al. 1979). While these studies generally find a positive relationship between peer SES and students' educational achievement and aspirations, they vary in their estimations of the magnitude and significance of these peer effects (Thrupp, Lauder, & Robinson 2002). Some authors, like Caldas & Bankston (1997) find a strong link between peer SES and student outcomes (see also Opdenakker & Van Damme 2001 and Entwisle & Alexander 1992). Others find that other peer characteristics (particularly ability composition) and school characteristics (like tracking or ability composition) mediate most or all of the effect of peer SES on student outcomes (Alexander & Eckland 1975; Alwin & Otto 1977; Alexander et al. 1979; Bryk, Lee, & Smith 1990; Sorenson & Morgan 2000). This latter group of scholars generally assumes that peer SES has a relatively minimal impact on students' educational achievement,

aspirations, and attainment. Hoxby and Weingarth (2005) find, for example, that peer achievement explains most of the effect of peer SES on student outcomes.

Overall, these studies suggest that peer SES composition has only a small independent effect on student outcomes. And yet, it seems likely that peer SES is more influential in friendship interactions than it is at the school or classroom level. Urberg (1992), for example, finds in his study of best friend and social crowd influences on adolescent cigarette smoking that adolescents are more susceptible to the influence of best friends than to that of larger social crowds and peer groups to which they belong. Thus, while Hoxby and Weingarth (2005) find only minimal effects of peer SES on student achievement gains, Urberg's findings suggest that best friend's SES may have a stronger impact than peer SES, and may thus remain large and significant even after controlling for other friend characteristics (e.g., best friends' academic achievement and aspirations) that may mediate the relationship between best friend's SES and college attendance.

Despite this possibility, very few existing studies use nationally representative data to directly measure the impact of friends' SES on student outcomes. This is largely because most surveys of children and adolescents do not collect information about their friends. Thus, the Add Health sample is unique in that it allows researchers to examine how friends' characteristics impact students' educational achievement, aspirations, and attainment. Because Add Health is also longitudinal, it allows researchers to bypass causality issues. Thus, we can examine not only the degree of similarity between individuals and their middle or high school best friends, but also how the characteristics of a student's best friend affect the student's likelihood of attending college years later.

The Goal and Scope of this Analysis

Overall, given the importance of individual SES in determining student outcomes and especially college attendance (Sewell, Haller, & Strauss 1957; Sewell & Shah 1967; Teachman 1987), we suspect that best friends' SES will play a significant role in shaping students' educational achievement, aspirations, and attainment. However, previous research points to several competing models of the relative influence of friends' SES on future attainment.

In light of these conflicting findings, then, this study will test three different hypotheses as we reviewed earlier. The first of these, the *booster thesis*, suggests that best friend's SES has a positive impact on college attendance for all students. The *homophily thesis* predicts that students with same-SES best friends will have the highest likelihood of college attendance. Finally, the *heterophily thesis* argues that cross-class friendships will be most beneficial to later educational attainment.

In testing these hypotheses, we will also investigate the possibility that the effects of best friends' SES vary for students from different social class backgrounds. We also examine whether and how the magnitude of the effect of best friend's SES varies with individual SES. For example, even if the booster thesis holds true for both high- and lower-SES students, having a high-SES best friend might be more beneficial for low-SES than for high-SES students.

Methods
Data Sample

This paper draws on data from the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a three-wave, school-based study of students who were in grades seven through twelve in 1994-1995. The study administrators followed the participants over time, collecting the most recent wave of data in 2001-2002. In this paper, we use data from Waves I and III of the survey to examine how the middle- or high-school characteristics of students and their best friends affect their educational outcomes seven to eight years later. Of the

more than 20,000 eighth- through twelfth-grade students in 134 public, private, and parochial schools that completed the initial survey, seventy-two percent also completed the Wave III survey. Thus, our sample includes only those 14,979 students who completed both the Wave I and Wave III surveys. We use a sample weight to account for attrition between these two waves.

After collecting the first wave of data, the survey administrators assigned each participant a random identification number. Using the initial in-school questionnaire, the administrators also asked each student to name his or her five best male, and five best female friends. If a student wanted to name a friend who was also in the data set, administrators asked the student to identify that friend by his or her Add Health identification number.[1] Administrators also coded named friends who did not participate in the Add Health study to say whether they attended the same school as the respondent, whether they were in the respondent's "sister school," or whether they did not attend an Add Health sample school.

By providing the identification numbers of respondents' friends, Add Health allows researchers to locate and examine the characteristics of these in-sample friends. In this study, then, we can only locate the SES of those best friends who are also in the Add Health sample. Despite this limitation, however, we do not exclude from our analysis those students whose best friend is not in the sample. Rather, by measuring best friend's SES categorically, we can compare the effect of having a high-, mid-, and low-SES best friend with the effect of having no best friend, having a best friend at a different school, or having a best friend who attends the same school but is not in Add Health the sample.

We do, however, exclude from our sample those students about which we have no information regarding SES. We use a sample weight to account for attrition from Wave I to

Wave III, but we also exclude those students who participated in Wave III but about which we have no information regarding college attendance.

Measures

Socioeconomic Status of Respondent. The goal of this analysis is to examine the effect of best friend's SES on students' educational attainment, and also to explore whether or not this effect varies in magnitude and direction with the respondent's own SES. We measure SES with mother's education because research shows that mother's education is the strongest predictor of educational outcomes (Sewell & Shah 1968; Christensen et al. 1975).

Where possible, we use respondents' mothers' self-reports of their own educational attainment to measure respondents' SES. The Wave I parent survey asks each parent respondent: "How far did you go in school?" The parent respondent may choose from ten different categorical responses, which we recode into three educational categories: completed at most a high school diploma or GED, completed some college (no bachelor's degree), and completed at least a four-year college degree.

For those respondents whose biological mothers did not complete the Wave I parent questionnaire, we use students' reports of their mother's educational attainment to measure SES. The Wave I in-school survey asks students if they live with their biological mother. It then asks those students who do live with their biological mother: "How far in school did she go?" Students may choose from ten different categorical responses, or may respond instead "I don't know if she went to school." We recode these responses into the same three categories that we use for mothers' self reports: completed at most a high school diploma or GED, completed some college (no bachelor's degree), and completed at least a four-year college degree.

We combine this information and use the three categories of educational attainment as the basis for the SES variable. Low-SES students are those whose mothers have completed at most a high school diploma or GED. Mid-SES students are those whose mothers have completed some college, and high-SES students are those whose mothers have completed at least a four-year college degree. In our data sample, approximately forty nine percent of respondents are low-SES, twenty eight percent are mid-SES, and twenty three percent are high-SES.

Best Friend. In this analysis, we examine the impact of best friend's SES on a respondent's educational attainment. To locate each respondent's best friend, we use the friend lists that students provide as part of the in-school Wave I survey. The questionnaire asks students to list their closest male and female friends, putting their best friend first, followed by their second-best friend, and so on within each gender category. For the purpose of our analysis, we focus on students' best, second-best, or third-best same sex friend. Thus, we create a variable that locates the "reference friend" for each respondent, the friend whose own information we use in the analysis.

If a student names a best same-sex friend who is also in the data sample, then that friend becomes the respondent's "reference friend." If, on the other hand, a student names a best same-sex friend who is not in the data sample, but does name a second-best same-sex friend who is in the data sample, then the second-best same-sex friend becomes the "reference friend." Finally, if neither of the respondent's two best same-sex friends is in the data sample, then the "reference friend" is the first named same-sex friend. We choose to use best or second-best same-sex friends so that we can include more respondents for whom we have information regarding friend's SES. Doing so does not, however, have any effect on the overall outcome of the analysis.

Best Friend Type. Once we identify a reference friend for each respondent, we can then create a categorical variable that determines each respondent's "best friend type." Each respondent has one of four best friend types: in-sample, non-sample, out-of-school, and no best friend. We locate each respondent's best friend type using the identification number of the reference friend. These friend identifiers may be either unique (corresponding to one of the students in the data set), or code-based. There are two code-based identification numbers. The first locates those students who attend sample schools, but are not in the Add Health sample, and the second locates those students who do not attend a sample school.

If the reference friend has a unique identification number (i.e., he or she is also an Add Health participant), then the respondent has an "in-sample best friend." Alternately, if the reference friend attends a sample school, but is not in the sample, then the respondent has a "non-sample best friend." Similarly, if the reference friend does not attend a sample school, then the respondent has an "out-of-school best friend." Finally, if the reference friend has no identification number, then the respondent has "no best friend." In our data sample, approximately sixteen percent of respondents have an "in-sample" best friend, fifty-five percent have a "non-sample" best friend, twenty-one percent have an "out-of-school" best friend, and nine percent have no best friend (See Figure 1 Below).[2]

[FIGURE 1 ABOUT HERE]

A key limitation in our study is the large portion of respondents with non-sample best friends. While we cannot escape this limitation, as it reflects the sampling procedures employed by Add Health researchers, there are few if any studies that provide fuller information about so many students' best friends. Additionally, because Add Health randomly samples students from within each sample school, we can tentatively assume that the results for students with in-sample

best friends would apply to those with non-sample best friends if more data were available. Overall, we believe that this limitation further highlights the need for more studies that document the characteristics of students and their best friends.

Socioeconomic Status of Best Friend. To determine the SES of each respondent's reference friend, we use the data that we generate by creating a measure of individual SES. We only have SES measures for those reference friends who are also in the data set, so the best friend's SES of a respondent corresponds with the individual SES of his best friend (i.e., high-, mid-, or low-SES as determined by the educational attainment of the best friend's mother). For example, if Respondent B's mother completed a four-year college degree by Wave I, then we label Respondent B as being "high-SES." If, in turn, Respondent A names Respondent B as his best same-sex friend, then we also label Respondent A as having a "high-SES" best friend.

Overall, then, we label those students whose best friend's mother has completed, at most, a high school diploma or GED as having a "low-SES" best friend. Friends with mothers who completed some college are "mid-SES" best friends, and those whose mothers completed a four-year degree are noted as "high-SES" best friends. Of those respondents who name an "in-sample" best friend, forty two percent have a low-SES best friend, thirty one percent have a mid-SES best friend, and twenty seven percent have a high-SES best friend.

We then create a series of categorical variables that denote "best friend's SES" for students with "in-sample" best friends: one for students with a high-SES best friend, one for students with a mid-SES best friend, and one for students with a low-SES best friend. Of those respondents who have in-sample best friends, twenty-seven percent have a high-SES best friend, thirty-one percent have a mid-SES best friend, and forty-one percent have a low-SES best friend. As we describe above, we also have categorical variables for each of the other best friend types:

non-sample, out-of-school, and no best friend. By creating these six friend-based categorical variables for each type of respondent, we can compare the effect of having a high-, mid-, or low-SES best friend to the effect of having a non-sample, out-of-school, or no best friend.

College Attendance. We use three questions from the Wave III student survey to determine whether or not each respondent has completed or is currently attending a four-year college. The first question asks respondents if they are currently enrolled in regular school. If a respondent answers yes to the first question, then the second question asks him: "Is this a high school, a two-year college, a four-year college, or a graduate school?" Finally, the third question asks all respondents: "What is the highest grade or year of regular school you have completed?" We then recode these answers into two different categorical responses: completed or attending and neither completed nor attending. We code respondents as "attending" if they have completed a bachelor's degree or are enrolled in a four-year college at Wave III. We code respondents as "not attending" if they have not completed a bachelor's degree and are not enrolled in a four-year college at Wave III.[3] In our sample, approximately thirty percent of respondents had completed at least a bachelor's degree or were attending a four-year college at Wave III.

Control Variables. Our analyses also include a number of control variables. Research shows that some of these control variables may affect friendship selection, while others may influence educational attainment. We include in our analyses categorical measures of each respondent's race and gender. We also include a measure of the respondent's age at Wave III. This allows us to control for the fact that many of the students who were in seventh or eighth grade at Wave I are only 18 or 19 years old at Wave III, and thus may not yet have made a decision regarding college attendance after high school. Because SES may be a proxy for school

orientation, and because students may choose friends who place a similar importance on academic success, we also include continuous measures of respondents' verbal ability and college aspirations at Wave I to account for selection into particular types of friendships. Finally, we include continuous measures of best friends' verbal ability[4] and college aspirations to play a similar role in accounting for similar types of biases.

Methods

We begin by providing cross-tabulations of college attendance at Wave III by respondents' and best friends' SES at Wave I. These sample statistics allow us to understand whether or not best friend's SES is related to college attendance and, if so, how this descriptive relationship varies with respondents' own SES.

We then use logistic regression models to estimate respondents' likelihood of attending a four-year college at Wave III. The four models in Table 4 examine the effect of best friend's SES on educational attainment without allowing for an interaction between individual and best friend's SES. The first model includes only categorical dummy variables for respondents' SES, with "low-SES" as the omitted category. The second adds categorical dummy variables for best friend's SES or best friend type, again omitting the "low-SES" category. This allows us to determine the extent to which best friend's SES explains the consistently strong relationship between individual SES and educational attainment. The third and fourth models add individual and best friend characteristics, respectively. Together, these models show the effect of different best friend types on students' subsequent college attendance without allowing these affects to vary for students from different social classes.

In Table 5, we combine individual and best friend's SES/type into a series of 18 categorical dummy variables, with "low-SES respondent with low-SES best friend" as the

omitted category. This allows us to test for an interaction between individual and best friend's SES. Thus, we can compare the effect of best friend's SES on college attendance within individual SES groups. For example, we can compare the likelihood of college attendance among low-SES students with low-SES best friends to that of low-SES students with high-SES best friends. In doing so, we can also assess the validity of the booster, homophily, and the heterophily theses, determining whether students benefit more from access to high-SES, same-SES, or different SES best friends.

In these additional models, we also add control variables measuring respondents' race, gender, academic achievement, and college aspirations, parents' expectations regarding college attendance, and best friends' academic achievement and college aspirations. Our goal in doing so is, first, to control for factors that might influence friendship selection, and second, to control for factors that might mediate the relationship between college attendance and individual or best friend's SES. Because additional best friend characteristics are only available for those students whose best friends are in the data sample, the final model in Table 4 includes only these students, and not those whose best friends attend different schools, those whose best friends attend the same school but are not in the sample, and those who do not name a best friend.

Results

Descriptive Statistics

We begin by examining how educational attainment varies for students with different characteristics. Table 1 presents sample statistics that compare college attendance rates across social classes, gender, and racial/ethnic groups. Not surprisingly, these statistics show that college attendance increases with respondents' social classes, and is more common among females (33.8%) than among males (27.3%), and among Asian and White respondents (47.4%

and 33.4%, respectively) than among Blacks (23.7%), Hispanics (18.4%), and those of other races (29.7%).

[TABLE 1 ABOUT HERE]

Table 1 also examines how the likelihood of college attendance varies with best friend's SES. As with individual SES, college attendance increases with best friend's SES (as predicted by the booster thesis). These statistics also show that college attendance rates are lower among those with no best friend (23.2%) or an out-of-school best friend (22.9%) than among those with an in-school best friend (32.9%).

Table 2 provides a breakdown of best friend's SES by respondent's SES for those respondents who have an in-sample best friend. This table allows us to examine the propensity of students from different social classes to form same- and cross-class friendships. Among low-SES students whose best friends are in the sample, 52.9 percent have low-SES best friends, 31.4 percent have mid-SES best friends, and 17.6 percent have high-SES best friends. Among mid-SES students whose best friends are in the sample, 32.0 percent have low-SES best friends, 24.0 percent have mid-SES best friends, and 44.0 percent have high-SES best friends. Among high-SES students whose best friends are in the sample, 24.4 percent have low-SES best friends, 26.7 percent have mid-SES best friends, and 48.9 percent have high-SES best friends. Thus, high- and low-SES students are more likely than mid-SES students to have homophilous friendships, while mid-SES students are more likely to have heterophilous ones.

Low-SES respondents are also most likely to have no best friend (10.0% of all low-SES students in the sample, compared to 9.1 percent among mid-SES students and 6.4 percent among high-SES students) or an out-of-school best friend (21.1% compared to 19.2% among mid-SES students and 17.7% among high-SES students).

[TABLE 2 ABOUT HERE]

What these descriptive statistics cannot tell us, however, is the extent to individual SES drives the relationship between best friend's SES and college attendance. If, as studies suggest (McPherson et al. 2001; Kandel 1978), the vast majority of high-SES students have high-SES friends, and the majority of low-SES students have low-SES friends, then individual SES may explain away the relationship between college attendance and best friend's SES. To investigate this possibility, we then compare educational attainment simultaneously across both individual and best friend's SES.

Table 3 provides sample statistics examining how college attendance varies within SES groups according to best friend's SES. Despite some minor differences between SES groups, we find that college attendance rates generally increase (or at least do not decrease) with best friend's SES. These descriptive statistics, then, provide support for our "booster" thesis, which suggests that students will benefit most from access to a high-SES best friend.

[TABLE 3 ABOUT HERE]

At the same time, however, we find that the difference in college attendance rates between those with high- and those with low-SES best friends also increases with SES, with rates rising almost ten percent for low-SES students, fifteen percent for mid-SES students, and nearly twenty-four percent for high-SES students. This suggests that although college attendance may increase with best friend's SES, and while it does so regardless of students' own SES, it does not decrease the SES gap in college attendance. Rather, the effect of best friend's SES seems to further increase the gap between low, mid, and high SES students.

What these descriptive statistics cannot show us, however, is the extent to which other factors may mediate or moderate these observed relationships between college attendance and

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individual and best friend's SES. Thus, we use multivariate models to estimate the effect of best friend's SES on college attendance and the ways in which this effect varies across different SES groups. Moreover, we can better evaluate the influence of friends' SES net of students' other individual and best friend characteristics.

Multivariate Models

Table 4 includes four logistic regression models estimating the impact of individual and best friend's characteristics at Wave I on a student's likelihood of college attendance at Wave III. For clarity and ease of interpretation, we present both logistic regression coefficients and odds ratios. The dependent variable is the log odds ratio of attending college and the independent variables are also converted to logged values. We transform these coefficients to odds ratios for ease of interpretability. An odds ratio greater than one indicates that increases in that factor increase the odds of college attendance, while an odds ratio less than one indicates a negative effect. Some of our statements below will use the reciprocal values of the odds ratios so that our descriptions follow an intuitive metric for readers less familiar with such statistical tools. All of the models in Table 4 estimate the effect of Wave I characteristics on an outcome variable—college attendance—that we measure at Wave III.

[TABLE 4 ABOUT HERE]

Model 1 examines only the impact of individual SES on college attendance. As expected, this model shows that SES (as measured by mother's educational attainment) positively correlates with individual educational attainment. High-SES students have odds of attending or completing a four-year college that are 6.5 times and mid-SES students have odds 1.9 times those of low SES students.

Model 2 adds measures of best friend's SES and, for those students whose best friend is not in the sample, measures of best friend type. Consistent with the "booster" thesis, Model 2 suggests that even after controlling for individual SES, the likelihood of college attendance increases with best friend's SES. Students with high-SES best friends have odds of college attendance that are twice those of students with low-SES best friends (the comparison group), and those with mid-SES best friends have 1.6 times the odds. We also find that best friend's SES explains a modest share of the effect of individual SES on college attendance.

Models 3 and 4 add individual and best friend characteristics that allow us to account for both selection into particular types of friendship and factors that may simultaneously shape both best friend characteristics and college attendance. These include individual race, gender, age, verbal ability, college aspirations, and mother's expectations regarding college completion and best friend's verbal ability and college aspirations. In these models, we see that high-SES best friends continue to increase the odds that a student will attend a four-year college, though their effect decreases somewhat with the addition of the control characteristics. Not surprisingly, both individual and best friend's verbal ability and college aspirations, and mother's expectations regarding college completion are all strongly and positively correlated with college attendance. Our findings with respect to the effects of race and gender on college attendance are also in line with those of prior research, suggesting that once aspirational and achievement factors are controlled, females and minorities are more likely than males and whites to attend four-year colleges. Finally, our results show that older respondents were more likely to be attending a four-year college at Wave III. This is not surprising given the fact that many of the younger students may have still been in high school, attending a junior college, or taking time off between high school and college at Wave III.

Unlike Table 4, the models in Table 5 allow for an interaction between individual and best friend's SES. They do so by including a separate categorical variable for each of the eighteen individual-SES/best-friend-type combinations (omitting Low-SES Respondents with Low-SES Best Friends).

[TABLE 5 ABOUT HERE]

Model 1 in Table 5 examines the impact of best friend's SES on college attendance while controlling for an interaction between individual and best friend's SES. Like the models in Table 4, this model shows that college attendance increases with best friend's SES for high-, mid-, and low-SES students. This provides further support for the booster thesis, suggesting that best friend's SES has a positive impact on college attendance regardless of individual SES.

While adding individual-level controls for gender, race and age, Model 2 does not substantially change the relationship between best friend's SES and college attendance that we find in Model 1. Not surprisingly, we also find that females are more likely than males to attend four-year colleges, while Blacks and Hispanics are less likely than whites and those of other races (most of whom are Asian) to be attending a four-year college at Wave III.

Model 3 adds individual-level controls for respondents' college aspirations, verbal ability and mother's college expectations, all of which could affect both a student's friendship selection and his likelihood of attending college. Not surprisingly, both of these factors correlate strongly and positively with college attendance. Adding these controls does not, however, change the overall pattern that we find in previous models, with best friend's SES having a positive impact on college attendance for students across the social class spectrum.

We also find, however, that there is some variation across student's social classes in terms of the effect of other best friend types. Having no best friend, for example, is fairly

detrimental for all students, but is most problematic for low-SES students. High- and Mid-SES students, on the other hand, are actually better off having no best friend than having a low-SES best friend. There is very little research on social isolation to explain these findings, as those studies that do exist do not examine the effect of isolation on educational outcomes. Kreager (2004), for example, finds that socially isolated students only have more negative outcomes (higher rates of delinquency) when they also have a history of negative interactions with peers. What this may suggest, however, is that friendless low-SES students may face ridicule on multiple fronts, and may, as a result, experience the kinds of conflict-filled interactions with peers that studies show lead to more negative outcomes. This may explain why having no best friend is particularly bad for low-SES students.

While verbal ability, college aspirations, and mother's expectations regarding college attendance do not substantially change the relationship between best friend's SES and college attendance, adding these factors does change the relationship between race and educational attainment. After controlling for verbal ability, college aspirations, and mother's college expectations, Black students are actually more likely than their white counterparts to attend four-year colleges. Adding these factors also decreases the educational attainment gap between whites and Hispanics, while increasing that between whites and those of other races.

In Model 4, we add controls for best friend's college aspirations and verbal ability. We also run statistical tests to compare the magnitude of all of the SES interaction coefficients in the model. These tests show that all of the coefficients are significantly different from each other, suggesting that within each SES group, best friend's SES has a significant impact on college attendance. In this final model, however, we also find that the answer to our initial question changes somewhat. While the previous models demonstrate that high-SES best friends have a

positive impact on college attendance regardless of students' own SES, Model 4 suggests, instead, that mid- and low-SES students benefit most from high-SES best friends, while high-SES students benefit most from mid-SES best friends. Interestingly, however, high-SES students still derive the greatest relative benefit from high-SES best friends (in comparison to low-SES best friends), though they derive an even greater benefit from having mid-SES best friends. Regardless of students' own SES, low-SES best friends have a significant detrimental impact on college attendance. While we do not interact best friend's verbal ability and college aspirations with students' SES, we do find that these best friend characteristics have a significant, positive impact on students' subsequent college attendance.

The covariates in each of our models operate in predicted directions. College aspirations, verbal ability, and mother's expectations regarding college attendance positively impact a student's likelihood of college attendance (Sewell et al. 1969; Wilson & Portes 1975), and do the same when measured as best friend's characteristics. Also in line with earlier research, we find that females' odds of college attendance are 1.3 times those of their male counterparts (Jacobs 1996). As we discuss above, however, the story for race is more complex. As expected, students of other races (who are predominantly Asian) have the highest rates of college attendance (Hirschman & Wong 1986), and Hispanic students have the lowest (Wotjkiewicz & Donato 1995), but once we control for aspirations and achievement, Black students are actually more likely than their white counterparts to attend a four-year college. Interestingly, once we control for best friend's other characteristics, Hispanics also have a higher likelihood of college attendance than do their white counterparts.

Discussion

Our initial descriptive and multivariate analyses suggested that the booster thesis would most accurately describe the relationship between best friend's SES and educational attainment, as students with high-SES best friends have the highest rates of college attendance, regardless of their own SES. After we control for other characteristics of students and their best friends, however, we find that the true relationship between best friend's SES and college attendance is actually more complex. While the booster thesis generally holds for all SES groups, there is also evidence to suggest that high-SES students benefit most (in terms of educational attainment) from having mid-SES best friends.

The overall support for the booster thesis is not surprising. Research on cultural and social capital suggests that high-SES parents transfer to their children the kinds of resources, knowledge, and skills that are particularly beneficial in institutional environments like schools and colleges. These results seem to suggest, then, that best friends may also play a role in facilitating this kind of capital transfer, with high-SES individuals transferring some of their own knowledge, skills, and resources to their best friends.

The fact that high-SES students benefit most from having mid-SES best friends is, however, somewhat more difficult to explain. This may suggest that high-SES students can only derive so much from transfers of high-SES social and cultural capital, and that having a high-SES best friend can only add so much above and beyond that which they receive from their parents. Having a mid-SES best friend, on the other hand, might expose high-SES students to additional resources or knowledge that they could not acquire from high-SES sources. Having friends with different life circumstances might "broaden the horizons" of high-SES students, and might help them to further recognize the importance of a college degree in shaping the kinds of lifestyle that one can lead in later life.

While it is difficult to assess the causes of these trends, our results do provide insight into the causes of persistent class-based gaps in educational outcomes in America. Low-SES students with high-SES best friends have fairly high rates of college attendance. Those with low-SES best friends, on the other hand, are among the least likely to attend a four-year college. Low-SES students are also the least likely to actually have a high-SES best friend. Thus, in light of the fact that low-SES students stand to gain the most from high-SES friendships, they are least able to do so. Thus, our results suggest that patterns of class homophily in adolescent friendships may contribute to class-based gaps in school outcomes by limiting low-SES students' access to potentially beneficial friendships and by reserving such friendships largely for those who already receive the lion's share of benefits in our society.

This is not to say, however, that our own study is without limitations. Our sample, for instance, includes only those students who lived with their biological mothers at Wave I, as these are the only students for whom we can calculate SES. And yet, while this limitation does restrict our sample size, we do not believe that it substantially affects the findings of our analysis. The vast majority of the students in the original sample (88.8%) lived with their biological mothers at Wave I, and are thus included in our sample. This percentage is also comparable to similar percentage in census reports (88.9%; US Census Bureau 2006), suggesting that our findings are at least applicable to the majority of students and families in society as a whole.

Another problem with our study is the fact that only a minority of the Add Health respondents who competed both the Wave I and Wave III questionnaires (27.2%) actually lists a best, second-best, or third-best same-sex friend for whom SES data is available. While we cannot avoid this limitation, we do know that Add Health randomly sampled students from within each sample school. As a result, those students with in-sample friends should be representative of

those respondents whose best friends attend the same school but are not in the sample. Thus, while the large number of students our sample with non-sample friends clearly points to the need for new studies that more fully sample populations of students and their best friends, we can argue that this limitation should not substantially bias our results.

Some readers may also consider our dependent variable a limitation. In this study, we measure the effect of best friend's SES on four-year college attendance. While the ideal outcome measure would be completion of a four-year college degree, such a measure is not practical with only three waves of Add Health data. At Wave III, only half of the respondents who were in high school at Wave I were old enough to have completed college (approximately 22 years of age) by Wave III. Thus, if we limit our outcome variable to college completion, we significantly limit our sample size. Once future waves of Add Health data become available, however, we hope to repeat our study to test the effect of best friend's SES on college completion.

Conclusions

Despite these limitations, this study clearly shows that best friend's SES has a substantial impact on students' future educational attainment, and that socioeconomically homophilous friendships are generally more beneficial than high-SES ones. The impact of best friend's SES is not, as research on peer effects more generally often suggests, uniform for all students. Rather, the effect of best friend's SES varies with individual SES such that high-, mid-, and low-SES students derive different benefits from the same types of friends. While our results show general support for the booster thesis, they also highlight the fact that the specific effects of different best friend types vary somewhat with students' own social class background. More specifically, we find that mid- and low-SES students benefit most from high-SES best friends, while high-SES students benefit most from mid-SES best friends.

We argue from these findings that best friends, like parents, may play a key role in transferring social and cultural capital. In light of both this capital transfer process and the homophilous nature of adolescent friendships in the United States, we suggest that best friends may also contribute to the persistence and widening of class-based gaps in students' educational and life outcomes. Finally, while we have begun here to discuss some of the possible explanations for these class-based patterns and interactions, we still need more detailed, longitudinal research on adolescent friendship formation to fully understand the role of friendship in shaping individual life course trajectories.

Notes

1 Survey administrators gave each student a roster containing the names and identification numbers of other students in their school (or sister school) who were participating in the Add Health study. Students used these rosters to identify their friends. The administrators then destroyed the rosters upon completion of the survey.

2 All reported percentages are weighted to account for attrition between Waves I and III of the Add Health Study.

3 We use four-year college attendance as our outcome variable because college attendance and completion are strongly and positively correlated with other outcomes that determine success in life more generally (Day & Newburger 2002).

4 We measure academic achievement using students' scores on the Add Health Picture Vocabulary Test.

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Table 1:
College Attendance at Wave III by Respondent's and Best Friend's Characteristics at Wave I

Category	Characteristics	Attending (%)*	N
Respondent's SES	High-SES	**60.8**	3242
	Mid-SES	**31.2**	3483
	Low-SES	**19.1**	5977
Best Friend Type	High-SES	**53.0**	851
	Mid-SES	**39.1**	913
	Low-SES	**26.4**	1331
	No Best Friend	**23.2**	1393
	BF Not in Sample	**32.4**	7207
	BF in Non-Sample School	**22.9**	3259
Respondent's Race	White, Non-Hispanic	**33.4**	7965
	Black, Non-Hispanic	**23.7**	3208
	Asian, Non-Hispanic	**47.4**	1032
	Other, Non-Hispanic	**29.7**	250
	Other	**18.4**	2406
Respondent's Gender	Male	**27.3**	7062
	Female	**33.8**	7865

*Percentages are Weighted to Account for Attrition between Waves I and III

Table 2:
Best Friend's SES by Respondent's SES for Respondents with In-Sample Best Friends

Respondent's SES		Best Friend's SES		
		High	Mid	Low
Low	%*	**17.6**	**29.4**	**52.9**
Mid	%	**25.6**	**35.4**	**39.0**
High	%	**48.9**	**26.7**	**24.4**

*Percentages are Weighted to Account for Attrition between Wave I and Wave III

Table 3:
College Attendance at Wave III by Respondent's SES and Best Friend's SES at Wave I

Respondent's SES	Best Friend's SES	Attending (%)*	N
High-SES	High	**78.0**	352
	Mid	**72.0**	197
	Low	**54.3**	170
	No BF	**56.8**	233
	BF Not in Sample	**60.8**	1681
	BF Not in Sample School	**51.2**	609
Mid-SES	High	**43.1**	205
	Mid	**43.0**	275
	Low	**28.1**	283
	No BF	**25.6**	288
	BF Not in Sample	**33.0**	1700
	BF Not in Sample School	**14.3**	732
Low-SES	High	**29.6**	191
	Mid	**24.7**	328
	Low	**20.0**	694
	No BF	**14.1**	587
	BF Not in Sample	**20.6**	2886
	BF Not in Sample School	**14.4**	1291

*Percentages are Weighted to Account for Attrition between Waves I and III

Table 4: The Effects of Individual and Best Friends' SES at Wave I on Four-Year College Attendance at Wave III

	Model 1			Model 2			Model 3			Model 4		
	Est	Sig	OR	Est	Sig	OR	Est	Sig	OR	Est	Sig	OR
Intercept	-1.0093	***		-1.512	***		-10.470	***		-13.195	***	
Best Friend Type												
High SES	1.074	***	2.93	0.725	***	2.06	0.514	***	1.67	0.428	***	1.54
Mid SES	0.473	***	1.61	0.345	***	1.41	0.292	***	1.34	0.288	***	1.33
Low SES	--	--	--	--	--	--	--	--	--	--	--	--
Out-of-School	0.367	***	1.44	0.153	***	1.17	0.075	***	1.08	--	--	--
Not in Sample	-0.014	***	0.99	0.273	***	1.31	0.246	***	1.28	--	--	--
No Best Friend	0.409	***	1.51	-0.144	***	0.87	0.029	***	1.03	--	--	--
Respondent's SES												
High				1.810	***	6.11	1.275	***	3.58	1.182	***	3.26
Mid				0.664	***	1.94	0.393	***	1.48	0.372	***	1.45
Low				--	--	--	--	--	--	--	--	--
Respondent Characteristics												
Male							-0.372	***	0.69	-0.318	***	0.73
Female							--	--	--	--	--	--
White, Non-Hispanic							--	--	--	--	--	--
Black, Non-Hispanic							0.051	***	1.05	0.590	***	1.80
Other, Non-Hispanic							0.801	***	2.23	0.823	***	2.28
Hispanic							-0.137	***	0.872	0.183	***	1.20
Age at Wave III							0.037	***	1.038	0.061	***	1.06
Verbal Ability							0.044	***	1.05	0.038	***	1.04
College Aspirations							0.738	***	2.09	0.773	***	2.17
Mother's College Expectations							0.135	***	1.14	0.103	***	1.11
Best Friend's Characteristics												
Verbal Ability										0.024	***	1.02
College Aspirations										0.071	***	1.07
N	14318			14083			12066			3824		
Likelihood Ratio	450258			2814953			4814250			1203098		
Somer's D	0.187			0.411			0.575			0.569		

***p<.001 **p<.01 *p<.05

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Table 5: The Effects of Individual and Best Friends' Characteristics at Wave I on College Attendance at Wave III; Interactions between Individual and Best Friend's SES

	Model 1		Model 2		Model 3		Model 4	
	Est / Sig	OR	Est / Sig	OR	Est / Sig	OR	Est / Sig	OR
Intercept	-1.402***		-0.852***		-10.356***		-13.118***	
R's SES by Best Friend Type								
R High SES; BF High SES	2.366***	10.65	2.274***	9.72	1.655***	5.23	1.483***	4.41
R High SES; BF Mid SES	1.989***	7.31	1.877***	7.22	1.539***	4.62	1.547***	4.70
R High SES; BF Low SES	1.456***	4.29	1.406***	4.08	0.955***	2.60	0.961***	2.62
R High SES; BF Out-of-School	1.815***	6.14	1.826***	6.21	1.170***	3.22		
R High SES; BF Not in Sample	1.926***	6.86	1.921***	6.82	1.381***	3.8		
R High SES; No Best Friend	1.684***	5.39	1.660***	5.26	1.308***	2.70		
R Mid SES; BF High SES	1.332***	3.79	1.363***	3.91	0.942***	2.56	0.818***	2.27
R Mid SES; BF Mid SES	0.977***	2.66	0.939***	2.56	0.669***	1.95	0.582***	1.79
R Mid SES; BF Low SES	0.537***	1.71	0.491***	1.62	0.275***	1.32	0.149***	1.16
R Mid SES; BF Out-of-School	0.383***	1.47	0.368***	1.44	0.098***	1.10		
R Mid SES; BF Not in Sample	0.815***	2.26	0.831***	2.30	0.528***	1.70		
R Mid SES; No Best Friend	0.456***	1.58	0.463***	1.58	0.335***	1.40		
R Low SES; BF High SES	0.625***	1.87	0.558***	1.74	0.313***	1.37	0.217***	1.24
R Low SES; BF Mid SES	0.196***	1.22	0.134***	1.14	0.075***	1.08	0.047***	1.05
R Low SES; BF Low SES								
R Low SES; BF Out-of-School	0.320***	1.38	0.299***	1.34	0.262***	1.30		
R Low SES; BF Not in Sample	0.202***	1.22	0.212***	1.24	0.180***	1.20		
R Low SES; No Best Friend	-0.381***	0.68	-0.364***	0.70	-0.155***	0.86		
Respondent's Characteristics								
Male			-0.371***	0.69	-0.371***	0.69	-0.320***	0.73
Female								
White, Non-Hispanic								
Black, Non-Hispanic			-0.368***	0.69	0.056***	1.06	0.58***	1.80
Other, Non-Hispanic			0.567***	1.76	0.798***	2.22	0.815***	2.26
Hispanic			-0.421***	0.66	-0.149***	0.87	0.173***	1.89
Age at Wave III			-0.012***	0.99	0.036***	1.04	0.056***	1.06
Verbal Ability					0.044***	2.10	0.038***	2.17
College Aspirations					0.740***	1.05	0.776***	1.04
Mother's College Expectations					0.001***	1.14	0.100***	1.11
Best Friend's Characteristics								
Verbal Ability							0.024***	1.02
College Aspirations							0.069***	1.07
N	14083		13399		12066		3824	
Likelihood Ratio	2863090***		3139973***		4844946***		1215400	
Somer's D	0.410		0.437		0.575		0.571	

***p<.001 **p<.01 *p<.05

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Figure 1: Percent of Respondents with each Best Friend Type