# Social Networks and College Choice

Sean Lewis-Faupel*

April 2014

**Abstract**

College attendance is an important life decision that occurs during a time when social influences are particularly strong. The goal of this paper is to quantify the impact of social networks, specifically the choices made by friends of an individual, on the college attendance decision. Using previously documented features of high school friend networks, an instrumental variables approach is able to identify an effect distinct from any correlation between social environment and outcome (e.g., wealthy schools send more students to college) as well as account for the potential endogeneity of friendship network formation. Student, friendship, and school data from the Wisconsin Longitudinal Study are used for estimation. The IV effects are large and significant for sending any college application and attending college, while smaller and insignificant for considering college. This is taken as evidence that friends have the largest effect when a student is near the margin of attending college but are not able to move a student to college attendance if they have never considered it. Finally, a model that fully endogenizes the formation of social networks and can answer more complex policy questions is outlined.

*The author is at the University of Wisconsin–Madison. This research received support from the grant T32 HD007014, awarded to the Center for Demography and Ecology at the University of Wisconsin–Madison by the Eunice Kennedy Shriver National Institute of Child Health & Human Development.

# 1 Introduction

The decisions of students as they encounter the college admissions process are of profound importance to their future lives. A large literature exists across multiple disciplines demonstrating the impact of college attendance on a multitude of future outcomes, and the overwhelming majority of these show positive associations with post-secondary schooling. In addition, many economists have posited that education is a good with positive externalities, not only making those individuals who consume additional schooling better off but also improving the welfare of the surrounding society.

Distinct from the traditional benefits of college, for many students, attending a university is a social experience. The decision process regarding college takes place during an age range when, according to the psychology literature, children are just past their peak of susceptibility to peer influences (Berndt, 1979) and are most likely to make risky decisions when peers are involved (Gardner and Steinberg, 2005). Since there may be a large social element to the decisions of whether to apply to college, how many applications to send, and ultimately whether to enroll in college, it is important to understand these influences when studying the college admissions process.

While merely attending college may be important, a related phenomenon is "college mismatch," when students enroll at universities inconsistent with their earlier academic performance. Hoxby and Avery (2012), Arcidiacono et al. (2013), and many others document college mismatch as a common occurrence. While this research cannot speak directly to this question, the social influences measured here may at least partially explain why strong students enroll in relatively "easy" colleges.

The primary goal of this paper is to quantify the impact of social networks, specifically the choices made by friends of an individual, on the college attendance decision. To the author's knowledge, no other research has measured the impact on college attendance of having additional friends (not just peers) who attend college. A typical peer effects model is employed but with best friends as the reference group. Exogenous differences in the number of potential friends of a student is assumed to result in varying levels of similarities between friends (which has been previously documented). The resulting variation is used to measure

an effect of friends' college attendance on a student considering college, applying to college, the number of applications sent, and attending college. This approach is able to separate the correlated effects that result from a shared environment or the grouping of individual traits among students in the same social group from the endogenous effect of interest. While recent theoretical work on peer effects has addressed the issues of separately identifying these effects, it has also assumed either fixed and known or exogenous network structure. This paper relaxes that assumption by using an exogenous portion of variation in social network.

In related research, Gaviria and Raphael (2001), Zimmerman (2003), Babcock (2008), and others examine the effects of young adults' peers on academic outcomes. For a review, see Sacerdote (2011). More recently, Fletcher (2013) measures peer effects on college attendance using friends' siblings as an instrument. He finds that increasing the proportion of classmates attending college by 10 percentage points increases the probability that an individual attends college by 2-3 percentage points.

In contrast, this paper finds large reduced form effects from having friends who will attend college on college-going behavior, in the range of 8-15 percent higher probabilities of a given outcome. The IV estimates, however, tend to be even larger (by an order of magnitude in some cases), which is taken to be a result of the IV measuring a local effect. Estimates lose significance when the outcome is considering college or the number of college applications submitted, suggesting that the friend effect is important for those who are near the margin of the college attendance decision.

Motivated by the regression results, the basic model of peer and friend effects is extended to one with greater structure on the formation of friend groups, dynamically modeling the process by which social networks form prior to college decisions and the role these networks play in the ensuing application and enrollment choices. A structural model of this process allows for potential policies to be tested that would affect the parameters estimated in the reduced form and IV analysis.

The paper proceeds in Section (2) with discussion of a model of peer and friend effects and the associated identification issues as well as the solutions proposed by this paper. Section (3) describes the data used, Section (4) reviews the findings of the regression analysis, and Section

(5) outlines a structural approach to modeling friend formation. Section (6) concludes.

# 2 Measuring the Impact of Best Friends

## 2.1 Challenges to Identification

As noted in the introduction, a great deal of research has examined the association between the outcomes of a student's peer group and the student's own outcomes. Aside from standard endogeneity issues, Manski (1993) describes and Brock and Durlauf (2001a) expand upon several issues specific to the study of peer effects. If the behavior of interest is a linear function of individual characteristics, mean group characteristics, and average group behavior, the underlying structural parameters of the model cannot be recovered from standard OLS regressions. Intuitively, if certain mean group characteristics (such as high income) are associated with certain group behaviors (such as college attendance), one cannot separately measure the effect of each of these inputs on individual outcomes (since observing one of the two increase implies that the other increases as well). Additionally, the simultaneous nature of the individuals actions and those of her peers makes causal measurement difficult (Manski terms this the "reflection problem")

Much work has been done to relax the assumptions that lead to the above issues (for instance, Brock and Durlauf (2001b; 2007) and Graham (2008)). Similar to the approach in this paper, Bramoulle, Djebbari, and Fortin (2009) consider the case where the group of peers that affects individual behavior varies across agents. Given some relatively weak assumptions on the network structure, they show that the above problems can be overcome and social effects are identified using extended network connections (i.e., friends of friends).

An important assumption made by Bramoulle, Djebbari, and Fortin is that network structures are either fixed and known or are exogenous. There are a number of reasons to think that this is not the case. For instance, friends may bond due to similar socioeconomic backgrounds, but these traits are also highly predictive of college attendance. How one invests in a social network may also be a quality associated with how one invests in future education. If these associations vary across schools or if they involve unobservables, the networks will be either

not fixed or not known to the researcher. And the correlation with the outcome of interest prevents any assumptions of exogeneity.

The approach of this paper is to find exogenous variation in the type of friends available. While this allows us to deal with correlated effects, it does not alleviate the reflection problem. Adding one additional friend of a certain type, even randomly, does not change the simultaneous nature of the college attendance decision. So while we are able to deal with potential endogeneity of network formation, we cannot control for this type of identification issue.

The ideal analysis along this line of reasoning compares two individuals who are otherwise identical but with different proportions of friends attending college. While this experiment is not possible to carry out in practice, an instrumental variable approach offers an alternative. First, further structure is placed on students' social interactions to motivate several instruments.

## 2.2 A Reduced Form Model of Social Interactions

The proclivity of individuals to form friendships with those who have similar characteristics is well known. Mayer and Puller (2008), for instance, measure the strength of these preferences in young adults and find them to be strong enough that policies designed to increase interactions with different types have little effect on friend choices. Similarly, Weinberg (2007) finds that social sorting among high school students is substantial and occurs to a greater degree in larger groups.

Taking this as motivation, we assume that, with no design on the underlying network formation, in equilibrium individuals choose as friends those with a similar vector of traits. Taking one of these traits to be ability and assuming a causal impact of ability on college attendance (structural estimates by Belzil and Hansen (2002), for one, suggest this is the case), friends should on average make similar college decisions, aside from any causal impact of the college-going behavior within the friend group.

Furthermore, consistent with Weinberg (2007), we assume that the size of one's friend options

affects, in equilibrium, the degree to which friend similarities exist, all else equal (including the composition of the potential friends). Intuitively, if we increase the number of potential friends (which we will call social group size) but hold their distribution of traits constant, the supply of possible similar friends will increase. One potential outcome of such a model is that the number of friends attending college is a linear function of ability, social group size, and their product:

$$\#\text{college-going friends}_i = \alpha_1 \text{ability}_i + \alpha_2 \text{social group size}_i + \alpha_3(\text{ability}_i * \text{social group size}_i) + \varepsilon_i$$

where $i$ indexes individuals; $\alpha_1 > 0$, since conditional on a small social group size, higher ability should result in more college-going friends; $\alpha_2 < 0$, because given low ability, increasing social group size should result in more similar (fewer college-going) friends; and $\alpha_3 > 0$, since higher ability students in larger social groups will find a greater number of higher ability, college-going friends.

In a more flexible scenario, individuals are members of multiple social groups. Supposing that each group is *ex ante* associated with ability (e.g., Physics Club), the outcome could be that students who are members of larger high ability social groups are more likely to have high ability, college-going friends. On the other hand, those who are part of a smaller, similar group have fewer similar friend options and thus few college-going friends. The linear version of this relationship can be written as:

$$\#\text{college-going friends}_i = \sum_j \gamma_{1j} \text{high ability social group size}_{ij} + \sum_k \gamma_{2k} \text{low ability social group size}_{ik} + \varepsilon_i$$

where $j$ and $k$ index social groups of which individual $i$ is a member, and $\gamma_{1j} > 0$ and $\gamma_{2k} < 0$ for the reason described above.

While we are allowing individuals to choose friends, we will assume that the social group size is fixed, or at least there is no sorting into these groups in a specific manner. More precise assumptions are given in the next section.

### 2.3 Instrumental Variables

Taking a causal model of the form

$$\text{College Choice}_i = \beta_1 \text{Friends' College Choices}_i + X_i'\beta_2 + \varepsilon_i,$$

our aim is to estimate the parameter $\beta_1$. The model described in the previous section gives a possible set of instruments to estimate this underlying value. Here, we utilize two potential social groups: the high school as a whole, and the extracurricular activities in which students participate.

Conditional on the model of social group size and friendship being correct, the necessary assumption that the instrument and endogenous variable (friends' college choices) are correlated should hold. (This assumption is of course testable in the first stage of the IV.) Because the distribution of ability may change across high schools, we instrument using both high school size and more flexible polynomials in high school size. In the case of extracurriculars, the size of each activity a student participates in is allowed to have a unique linear effect.

An additional assumption of the IV approach is that the social group size does not affect the outcome through any unobservable variable. Since high school size may be correlated with determinants of college attendance such as the level of educational resources (teachers, funding, etc.), the individual incomes of students' families, the distance to a college or university, ability tracking, or the general college-going culture, controls for these covariates and others are included. The resulting regression model using high school size as an instrument is given by

$$\begin{aligned}\text{College Choice}_i = \delta_1 \text{Friends' College Choices}_i + \\ \delta_2[f(\text{high school size}_j) \times \text{ability}_i] + \delta_3 \text{ability}_i + V_j'\delta_4 + X_i'\delta_5 + \varepsilon_i\end{aligned}$$

$$\begin{aligned}\text{Friends' College Choices}_i = \lambda_1 f(\text{high school size}_j) + \\ \lambda_2[f(\text{high school size}_j) \times \text{ability}_i] + \lambda_3 \text{ability}_i + V_j'\lambda_4 + X_i'\lambda_5 + \eta_i,\end{aligned}$$

where $i$ indexes individuals, $j$ indexes high schools, $V_j$ is a vector of high school characteristics, $X_i$ is a vector of individual characteristics, and $f(\cdot)$ is polynomial of degree $n$.

In the case of the extracurricular instruments, the existence and size of extracurriculars at each high school can be controlled for. In addition, variation in the instrument exists within high schools so that high school fixed effects may be used. Since extracurricular participation is itself a determinant of college attendance, these memberships are controlled for as well.

$$\text{College Choice}_i = \delta_1 \text{Friends' College Choices}_i + \left[\sum_j \delta_{2j} \text{Extracurricular Member}_{ij}\right] + V_j'\delta_3 + X_i'\delta_4 + \zeta_j + \varepsilon_i$$

$$\text{Friends' College Choices}_i = \left[\sum_j \lambda_{1j}(\text{Extracurricular Size}_{ij} \times \text{Extracurricular Member}_{ij})\right] + \left[\sum_j \lambda_{2j} \text{Extracurricular Member}_{ij}\right] + V_j'\lambda_3 + X_i'\lambda_4 + \eta_i,$$

where $i$ indexes individuals, $j$ indexes high schools, $V_j$ is a vector of high school characteristics (possibly including extracurricular existence and/or size), and $X_i$ is a vector of individual characteristics.

An important implication of the exclusion restriction referenced above is that sorting into different sized social groups (schools or extracurriculars) cannot occur along dimensions of both ability and level of college-going friend seeking. For instance, this assumption would be violated if students who are both high ability and possess some unobserved propensity to have more college-going friends are students at larger high schools. This would be an issue for the extracurricular instruments as well since extracurricular size is correlated with high school size. Similarly, the exclusion restriction is violated if students who are both high ability and possess some unobserved propensity to have more college-going friends participate in larger extracurriculars on average. These types of sorting are an issue because they intro-

duce an unobservable path (a propensity to have more college-going friends) through which social group size affects college attendance. Note that sorting can occur in either dimension separately without leading to this problem.

# 3 Data

The data used to perform the above analysis comes from the Wisconsin Longitudinal Study (WLS). The WLS is a longitudinal study of over 10,000 individuals who graduated from Wisconsin high schools in 1957. The survey covers nearly all high schools that existed in the state at that time and samples approximately one third of students from each high school. While the survey is representative of the group sampled, it is not representative of the country as a whole. The vast majority of participants are white, and all completed their high school education. Regarding the latter feature of the data, those who are on the margin of attending college have most likely graduated from high school, making the WLS population a relevant one for this study.

The survey records, among many other things, whether the student considered attending college, the number of college applications submitted, and whether the student will be attending college during the year following high school graduation. Ability measures in the form of IQ and GPA rank with school are also given. The dataset also includes detailed high school information including number of students, teachers, and funding. In addition, respondents in the sample identified up to three best friends in their graduating high school class. The WLS also reviewed students' yearbooks to record all extracurricular activities listed there.

Table (1)(a) lists individual summary statistics. Since a friend's behavior is only observed if the friend is also in the one third sample, restricting the data to those with at least one friend in the sample reduces sample size by over 50 percent. As can be seen in the right panel of Table (1)(a), the selected sample is slightly higher ability, has more women, is slightly more wealthy, and is slightly more likely to take a step toward college attendance.

Table (1)(b) gives summary statistics for the high schools in the study. Many are in small towns and most do not have a college within fifteen miles. The average graduating class size

is around eighty students, though the largest schools are seven times bigger. The average school had about a third of its students go to college, and nearly 80 percent of schools had some type of college preparatory class.

Summary statistics of friends' college-going behaviors are presented in Table (1)(c). Four fifths of students had a friend who had at least considered attending college, while half of students had at least one friend headed to college. Table (1)(d) lists summary statistics for the ninety-seven extracurriculars listed in students' yearbooks. Almost all organizations existed at multiple schools, and their sizes vary substantially.

# 4 Results

## 4.1 Reduced Form

Table (2)(a) gives reduced form estimates from a linear probability model of the effect of having any friends attending college on various college-going outcomes. Table (2)(b) repeats the exercise with number of friends attending college as the regressor of interest.

In both cases, the association between the friends' choices and the student sending any college applications is largest, while the link to attending college is only slightly weaker. The relationship is weakest for the outcome of considering college. These results are consistent with the idea that friends may have the largest effect on those on the margin between attending college and not. Those students who report having not considered college may have strong incentives or constraints that to do not lead to college, barriers that social influences cannot overcome. On the other hand, for those that are considering college, higher education may be a more viable part of their choice set, and friends' decisions may play a larger role as a consequence.

The reduced form effects are quite substantial – having any college-going friends increases probability of attending college by 12-15 percent according to Table (2)(a). However, most examples of the endogeneity that motivated the IV approach described above would tend to bias these estimates upward: Social skills attract high ability friends and increase the

probability of attending college. However, it is possible that students who invest more in social networks with some perceived value (that is, with college-going friends) choose to not attend college relatively more often, though there is little theory or data to back such a claim.

Of note are the differences between the specifications with and without high school fixed effects. While the fixed effects moderate the estimates across the board, they remain statistically indistinct, suggesting that the set of high school controls, which is present in all specifications, is fairly robust.

### 4.2 First Stage

To graphically illustrate the first stage of the high school size IV, we can hold fixed high school size and regress having any friend attending college on ability. The intercept term from that regression (which is the predicted outcome when ability is 0) is plotted for each of twenty quantiles of school size in Figure (1). The change in these points across the quantiles should give an estimate of the coefficient on high school size. As the figure shows, there is slight negative relationship, which is consistent with the theory above. However, quadratic and quintic functions (the latter is graphed) of high school size fit the data better. One explanation for this is that the composition of ability is changing across the high school size distribution, resulting in a more complex relationship between ability, social group size, and the friend behavior.

Table (3) shows the regression results from the first stage of the high school size IV. The F-statistics from the joint test of whether the effect of the instruments is zero is below standard cutoffs for the lower order specifications (Columns (1), (2), (4), and (5)), suggesting these instruments may be weak. The estimates in columns (3) and (6) correspond to IVs estimated using limited information maximum likelihood, which performs better with multiple instruments which may be weak. Based on the simulations of Stock and Yogo (2002), the F-statistics in these two columns reject the hypothesis of a weak instrument, defined as failing a 5 percent Wald test of size 0.10 of the estimated parameter equaling the true value.

Figure (2) plots the coefficients for each extracurricular instrument from the first stage.

Because of the number of coefficients, no regression results for the first stage of the extracurricular instruments are given in the tables. However, the first stage F statistics are listed for each specification in Tables (4)-(11). Stock and Yogo (2002) suggest that the critical value for F-statistic for limited information maximum likelihood is 1.5-2 for this number of instruments. Almost all first stage F-statistics reported in the tables are above this cutoff. As a robustness check, Appendix Table (1) uses only the eleven strongest extracurricular instruments instead of the full set. The resulting F-statistics are well above the Stock and Yogo cutoff of 3.58. Any differences in the results may be partially attributable to differing local treatment effects induced by each set of instruments.

### 4.3 IV

Tables (4)-(11) present the results of the instrumental variables analysis. For the binary dependent variables, the effects are linear in the probability of the outcome. For example, the last column in Table (6) indicates that the probability of applying to college increases by 89 percent due to having any friend attend college. As shown in Tables (4) and (5), the effect of friends attending college on a student considering college is small and not significant. This finding further suggests that the margin over which friends' behavior has an impact is relatively narrow: Friends are unlikely to cause a student to shift from not considering college to attending college.

In Tables (6)-(9), friends' effect on college applications is estimated. While there is a significant and large impact on the decision to apply to college, the effect of friends is not significant for the number of applications using the extracurricular instruments, suggesting that the friend impact operates on the extensive more than the intensive margin. Tables (10) and (11) show that the effect of friends remains strong for the attendance decision (though slightly smaller than the effect on applications).

The effect sizes are very large, in some cases outside of the support of the dependent variable. One possibility is that there is a significant negative bias in the OLS estimates, though a story that would cause such a large bias is hard to come by. More likely there are heterogeneous treatment effects. In this case, the IV estimate is a local average treatment effect. That is,

the effect of having an additional college-going friend is not likely this large for all students but could be substantial for those whose friend selection responds to the instrument. These are students who are participating in extracurriculars that select on ability and as such may be closer to the margin of attending college and more influenced by friends in general.

Given that the effect sizes from the linear probability IV models exceed one in a number of cases, the effects may be better estimated with a model that constrains the outcome to zero or one. Appendix Tables (2)(a)-(f) estimate the binary outcome regressions from Tables (4)-(11) with this in mind. When the endogenous variable is number of friends attending college, an IV Probit model is used, which estimates the two stages as structural equations via maximum likelihood. When the endogenous variable is any college-going friends, Lewbel's (2000) special regressor method is used.

## 5 A Structural Model of Social Networks and College Choice

While the IV estimates demonstrate that social ties play a role in college decisions, the estimates shed no light on the structure of social networks and cannot speak to any shock that alters them. That is, the parameters from the IV model above can only be interpreted in partial equilibrium where we replace one non-college-going friend with a college-bound one, holding the remainder of an individual's network fixed. The equilibrium effects may be quite different. Placing greater structure on the formation of social ties can also suggest network-specific policies.

A simple three period model can capture some of these dynamics. In the first period, younger students learn their own ability and sort into networks based on their socioeconomic and demographic characteristics. In the second period, students make decisions regarding which colleges to attend. Attending a college also attended by those within one's network reduces the psychic costs of education. Classmates immediately adjacent in one's network reduce these costs the most, while those farther away do so to a smaller degree and those outside one's network do not reduce psychic costs at all. A student's choice set is determined by a noisy measure of their ability, and an outside option exists in which a student enters the

labor force immediately (the same network incentives exist for this option). Colleges vary in the expected earnings of their graduates (which are also partly determined by ability), in the dropout hazard rate, and in their costs (public/private). In the final period earnings are realized and consumed.

The estimated model allows us to examine a number of policy questions. For example, the model can be used to estimate the impact of changes to the gap between high school and college earnings given the existing influences of social networks. The effectiveness of varying levels of incentives that reward applying to college can be tested and traced through the network. And finally, the model could suggest how to optimally target specific individuals in a social network in order to maximize the impact on college decisions.

# 6 Conclusion

The role of social interactions in college choice is important to understand, and not only because its impact may be large. Social networks are likely to play a role in the success of policies designed to encourage college-going behaviors, but they are also important to take into account when considering the welfare implications of shifting students' college choices (perhaps the tendency of students to go along with what friends are doing implies they find value in conformity).

This paper demonstrates a potentially substantial effect of friends' college-going decisions on the college choices of individual students. The effect is largest and significant for sending any college application and attending college, while smaller and insignificant for considering college. This is taken as evidence that friends have the largest effect when a student is near the margin of attending college but are not able to move a student to college attendance if they have never considered it. The IV effects are also much larger than the reduced form estimates. Without reason to believe substantial negative bias exists in the reduced form specifications, these large effects likely indicate that the treatment is primarily locally relevant for those impacted by the instrument.

The identification strategy used here, rather than assuming either static and known or ex-

ogenous social network formation, uses previously documented aspects of high school friend networks to generate exogenous variation in social ties. This allows identification of social effects that are normally confounded by contextual effects. However, the fact that the student and her friend group act simultaneously is not fully dealt with by this approach.

The WLS cohort made college decisions over a half century ago when, one might argue, the college admissions environment and culture was substantially different. Future research could extend this analysis to a newer cohort using, for instance, the National Longitudinal Study of Adolescent Health. Additionally, integrating the methods of Bramoulle, Djebbari, and Fortin (2009) could help account for the reflection effect at the same time as dealing with the possibly endogenous social networks. This extension could also give an estimate of the degree to which the friend networks are endogenous and how much effect measurements are skewed as a result.

Furthermore, this paper's analysis could be deepened by accounting for the strength of friendships (by using dual friend nominations or post-high school reports of continued friendship) or by expanding the outcomes to look at the effect on the quality of college chosen or the number of other friends at the chosen institution. Finally, employing the structural model of network formation outlined in this paper, a number of bigger policy questions could be addressed, and assuming an accurate model and identification, further light could be shed on the econometrics of measuring peer effects.

## References


Peter Arcidiacono, Esteban Aucejo, Patrick Coate, and V Joseph Hotz. Affirmative action and university fit: evidence from proposition 209. *NBER Working Paper*, (w18523), 2013.

Philip Babcock. From ties to gains? evidence on connectedness and human capital acquisition. *Journal of Human Capital*, 2(4):379–409, 2008.

Christian Belzil and Jorgen Hansen. Unobserved ability and the return to schooling. *Econometrica*, 70(5):2075–2091, 2002.

Thomas J Berndt. Developmental changes in conformity to peers and parents. *Developmental Psychology*, 15(6):608, 1979.

Yann Bramoulle, Habiba Djebbari, and Bernard Fortin. Identification of peer effects through social networks. *Journal of econometrics*, 150(1):41–55, 2009.

William A Brock and Steven N Durlauf. Interactions-based models. *Handbook of econometrics*, 5:3297–3380, 2001a.

William A Brock and Steven N Durlauf. Discrete choice with social interactions. *The Review of Economic Studies*, 68(2):235–260, 2001b.

William A Brock and Steven N Durlauf. Identification of binary choice models with social interactions. *Journal of Econometrics*, 140(1):52–75, 2007.

Jason Fletcher. Social interactions and college enrollment: Evidence from the national education longitudinal study. *Contemporary Economic Policy*, 31(4):762–778, 2013.

Margo Gardner and Laurence Steinberg. Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. *Developmental psychology*, 41(4):625–, 2005.

Alejandro Gaviria and Steven Raphael. School-based peer effects and juvenile behavior. *Review of Economics and Statistics*, 83(2):257–268, 2001.

Bryan S Graham. Identifying social interactions through conditional variance restrictions. *Econometrica*, 76(3):643–660, 2008.

Robert M. Hauser and William H. [principal investigator(s)] Sewell. Wisconsin longitudinal study (wls) graduates, 1957-2005. URL `http://www.ssc.wisc.edu/wlsresearch/documentation/`. Machine-readable data file. Version 13.01.

Caroline M Hoxby and Christopher Avery. The missing "one-offs": the hidden supply of high-achieving, low income students. *NBER Working Paper*, (w18586), 2012.

Arthur Lewbel. Semiparametric qualitative response model estimation with unknown heteroscedasticity or instrumental variables. *Journal of Econometrics*, 97(1):145–177, 2000.

Charles F Manski. Identification of endogenous social effects: The reflection problem. *The review of economic studies*, 60(3):531–542, 1993.

Adalbert Mayer and Steven L Puller. The old boy (and girl) network: Social network formation on university campuses. *Journal of public economics*, 92(1):329–347, 2008.

Bruce Sacerdote. Peer effects in education: How might they work, how big are they and how much do we know thus far? *Handbook of the Economics of Education*, 3:249–277, 2011.

James H Stock and Motohiro Yogo. Testing for weak instruments in linear iv regression. *NBER Working Paper*, (No. 284), 2002.

Bruce A Weinberg. Social interactions with endogenous associations. *NBER Working Paper*, (No. 13038), 2007.

David J Zimmerman. Peer effects in academic outcomes: Evidence from a natural experiment. *Review of Economics and Statistics*, 85(1):9–23, 2003.

Table 1a: Individual Summary Statistics

| | Full Sample | | | | Estimation Sample | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Min | Max | Mean | SD | Min | Max |
| Male | 0.48 | 0.50 | 0 | 1 | 0.46 | 0.50 | 0 | 1 |
| IQ | 100.5 | 14.9 | 61 | 145 | 101.1 | 14.7 | 61 | 145 |
| GPA Percentile within HS | 50.3 | 28.8 | 0 | 99 | 52.6 | 28.4 | 0 | 99 |
| Number of Siblings | 3.25 | 2.57 | 0 | 26 | 3.27 | 2.59 | 0 | 22 |
| Mother Education > HS | 0.21 | 0.41 | 0 | 1 | 0.21 | 0.41 | 0 | 1 |
| Self-Assessed Relative Wealth (1-5) | 3.15 | 0.58 | 1 | 5 | 3.16 | 0.58 | 1 | 5 |
| Considered College | 0.73 | 0.44 | 0 | 1 | 0.76 | 0.43 | 0 | 1 |
| Any College Applications | 0.31 | 0.46 | 0 | 1 | 0.32 | 0.47 | 0 | 1 |
| Number of College Applications | 0.37 | 0.71 | 0 | 7 | 0.40 | 0.74 | 0 | 7 |
| Will Attend College Year After HS Graduation | 0.38 | 0.49 | 0 | 1 | 0.41 | 0.49 | 0 | 1 |
| Observations | 10317 | | | | 4800 | | | |

The left panel gives summary statistics for the full sample, while the right panel lists statistics for individuals with best friends who were also in the sample. The latter is used for estimation. Note that a student may report zero applications if planned attendance is at a two-year college with open enrollment.

Table 1b: High School Summary Statistics

| | Mean | SD | Min | Max |
|---|---|---|---|---|
| Observed Students | 23.5 | 26.8 | 1 | 159 |
| Size of High School Class (1957) | 78.1 | 87.3 | 5 | 482 |
| Percent of 1957 Graduates Attending College | 0.33 | 0.20 | 0 | 1 |
| Any College Preparatory Classes Reported | 0.79 | 0.41 | 0 | 1 |
| HS Seniors Per Teacher | 20.0 | 3.65 | 2.64 | 28.0 |
| Average Teacher Post-HS Schooling | 4.35 | 0.41 | 2.86 | 5.73 |
| Average Teacher Pay (in $1000s) | 4.25 | 0.60 | 3.06 | 5.75 |
| Total Spending (in $1,000,000s) | 1.40 | 3.33 | 0.027 | 11.7 |
| Town Population $< 1000$ | 0.39 | 0.49 | 0 | 1 |
| Town Population 1000-2499 | 0.23 | 0.42 | 0 | 1 |
| Town Population 2500-9999 | 0.17 | 0.38 | 0 | 1 |
| Town Population 10,000-24,999 | 0.057 | 0.23 | 0 | 1 |
| Town Population 25,000-49,999 | 0.048 | 0.21 | 0 | 1 |
| Town Population 50,000-99,999 | 0.030 | 0.17 | 0 | 1 |
| Town Population 100,000-150,000 (Madison) | 0.011 | 0.11 | 0 | 1 |
| Town Population 150,000+ (Milwaukee) | 0.062 | 0.24 | 0 | 1 |
| College/Univesity in Town | 0.18 | 0.39 | 0 | 1 |
| College/University within 15 Miles | 0.21 | 0.40 | 0 | 1 |
| College/University $> 15$ Miles Away | 0.61 | 0.49 | 0 | 1 |
| Observations | | 439 | | |

This tables lists summary statistics at the high school level.

Table 1c: Friends' College Behavior Summary Statistics

| | Mean | SD | Min | Max |
|---|---|---|---|---|
| Any Friends Considered College | 0.82 | 0.39 | 0 | 1 |
| Number of Friends Considered College | 1 | 0.62 | 0 | 3 |
| Any Friends Applied to College | 0.32 | 0.47 | 0 | 1 |
| Number of Friends Applied to College | 0.58 | 0.63 | 0 | 3 |
| Mean Number of Friends' College Applications | 0.44 | 0.71 | 0 | 7 |
| Any Friends Attending College After HS Graduation | 0.50 | 0.50 | 0 | 1 |
| Number of Friends Attending College After HS Graduation | 0.59 | 0.65 | 0 | 3 |

This tables lists summary statistics of observed friends' college choices across individuals in the study.

Table 1d: Extracurricular Summary Statistics

| | Number of Students in Extracurricular | Fraction of Students in Extracurricular | Number of Schools with Extracurricular | Fraction of Schools with Extracurricular | Average Extracurricular Size | SD of Extracurricular Size | Min of Extracurricular Size | Max of Extracurricular Size |
|---|---|---|---|---|---|---|---|---|
| Baseball | 800 | 0.078 | 269 | 0.62 | 2.97 | 1.76 | 1 | 10 |
| Basketball | 1122 | 0.11 | 302 | 0.69 | 3.72 | 2.63 | 1 | 23 |
| Cross Country | 85 | 0.0082 | 37 | 0.085 | 2.30 | 1.90 | 1 | 11 |
| Curling | 40 | 0.0039 | 10 | 0.023 | 4 | 2.11 | 1 | 7 |
| Football | 1426 | 0.14 | 272 | 0.63 | 5.24 | 3.43 | 1 | 26 |
| Track | 804 | 0.078 | 190 | 0.44 | 4.23 | 2.85 | 1 | 15 |
| Volleyball | 188 | 0.018 | 66 | 0.15 | 2.85 | 2.21 | 1 | 11 |
| Wrestling | 130 | 0.013 | 46 | 0.11 | 2.83 | 2.17 | 1 | 10 |
| Swimming | 79 | 0.0077 | 24 | 0.055 | 3.29 | 2.31 | 1 | 9 |
| Hockey | 25 | 0.0024 | 9 | 0.021 | 2.78 | 1.39 | 1 | 5 |
| Gymnastics | 64 | 0.0062 | 20 | 0.046 | 3.20 | 3.14 | 1 | 12 |
| Tennis | 75 | 0.0073 | 30 | 0.069 | 2.50 | 1.55 | 1 | 7 |
| Other Team Sport | 38 | 0.0037 | 14 | 0.032 | 2.71 | 1.94 | 1 | 7 |
| Sports Manager/Assistant | 182 | 0.018 | 114 | 0.26 | 1.60 | 0.94 | 1 | 6 |
| G.A.A. | 1692 | 0.16 | 187 | 0.43 | 9.05 | 7.98 | 1 | 50 |
| Intramurals | 873 | 0.085 | 100 | 0.23 | 8.73 | 8.68 | 1 | 59 |
| FFA Basketball | 7 | 0.00068 | 4 | 0.0092 | 1.75 | 0.96 | 1 | 3 |
| Archery Club | 75 | 0.0073 | 18 | 0.041 | 4.17 | 4.55 | 1 | 18 |
| Bowling Club | 377 | 0.037 | 50 | 0.11 | 7.54 | 7.37 | 1 | 32 |
| Golf Club | 126 | 0.012 | 66 | 0.15 | 1.91 | 1.05 | 1 | 5 |
| Rifle Club | 72 | 0.0070 | 21 | 0.048 | 3.43 | 2.01 | 1 | 8 |
| Tennis Club | 76 | 0.0074 | 32 | 0.074 | 2.38 | 2.06 | 1 | 10 |
| Other Club Sports | 229 | 0.022 | 36 | 0.083 | 6.36 | 6.88 | 1 | 25 |
| Cheerleading | 361 | 0.035 | 211 | 0.49 | 1.71 | 1.84 | 1 | 24 |
| Drill Team | 31 | 0.0030 | 8 | 0.018 | 3.88 | 2.90 | 1 | 9 |
| Majorettes | 55 | 0.0053 | 42 | 0.097 | 1.31 | 0.68 | 1 | 4 |
| Pompom | 2 | 0.00019 | 1 | 0.0023 | 2 | . | 2 | 2 |
| Twirling | 49 | 0.0047 | 33 | 0.076 | 1.48 | 0.94 | 1 | 5 |
| Booster Club | 235 | 0.023 | 45 | 0.10 | 5.22 | 7.49 | 1 | 45 |
| Letter Club | 741 | 0.072 | 189 | 0.43 | 3.92 | 2.35 | 1 | 15 |
| Pep Club | 1372 | 0.13 | 173 | 0.40 | 7.93 | 7.26 | 1 | 35 |
| Band | 1422 | 0.14 | 298 | 0.69 | 4.77 | 3.30 | 1 | 25 |
| Choral Ensembles | 1168 | 0.11 | 212 | 0.49 | 5.51 | 4.76 | 1 | 30 |
| Chorus/Choir | 2411 | 0.23 | 293 | 0.67 | 8.23 | 6.62 | 1 | 44 |
| Special Musical Performances/Events | 466 | 0.045 | 82 | 0.19 | 5.68 | 4.73 | 1 | 23 |
| Instrumental Ensembles | 107 | 0.010 | 49 | 0.11 | 2.18 | 1.63 | 1 | 7 |
| Orchestra | 268 | 0.026 | 76 | 0.17 | 3.53 | 2.48 | 1 | 9 |
| Pep Band/Marching Band | 446 | 0.043 | 138 | 0.32 | 3.23 | 2.48 | 1 | 14 |
| Swing Band | 107 | 0.010 | 51 | 0.12 | 2.10 | 1.43 | 1 | 7 |
| Drama | 2116 | 0.21 | 294 | 0.68 | 7.20 | 6.78 | 1 | 62 |
| Speech or Debate | 975 | 0.095 | 261 | 0.60 | 3.74 | 3.01 | 1 | 21 |
| Combined Drama & Speech Activity | 45 | 0.0044 | 10 | 0.023 | 4.50 | 4.22 | 1 | 13 |
| Badger Girls/Badger Boys State | 194 | 0.019 | 125 | 0.29 | 1.55 | 0.87 | 1 | 7 |
| National Honor Society | 246 | 0.024 | 55 | 0.13 | 4.47 | 3.86 | 1 | 19 |
| Other Honorary Groups | 126 | 0.012 | 36 | 0.083 | 3.50 | 3 | 1 | 11 |
| Dance/Banquet Committees | 933 | 0.090 | 103 | 0.24 | 9.06 | 8.22 | 1 | 41 |
| Graduation Committees | 137 | 0.013 | 17 | 0.039 | 8.06 | 11.5 | 1 | 45 |
| Homecoming/Prom Court | 862 | 0.084 | 246 | 0.57 | 3.50 | 2.45 | 1 | 19 |
| Other Activity Committees | 784 | 0.076 | 83 | 0.19 | 9.45 | 10.5 | 1 | 60 |
| Monitors/Classroom Officers | 888 | 0.086 | 87 | 0.20 | 10.2 | 13.0 | 1 | 63 |
| Library Aids | 762 | 0.074 | 243 | 0.56 | 3.14 | 2.18 | 1 | 11 |
| Other School Aids | 974 | 0.094 | 141 | 0.32 | 6.91 | 7.80 | 1 | 49 |
| Student Government | 1768 | 0.17 | 313 | 0.72 | 5.65 | 5.10 | 1 | 49 |
| Newspaper | 1430 | 0.14 | 251 | 0.58 | 5.70 | 3.57 | 1 | 21 |
| Yearbook | 1885 | 0.18 | 312 | 0.72 | 6.04 | 4.10 | 1 | 24 |
| Literary Magazine/Journalism | 233 | 0.023 | 57 | 0.13 | 4.09 | 3.30 | 1 | 12 |
| Chemistry Club | 80 | 0.0078 | 10 | 0.023 | 8 | 7.04 | 1 | 20 |
| Foreign Language Club | 90 | 0.0087 | 10 | 0.023 | 9 | 12.2 | 1 | 42 |
| French | 114 | 0.011 | 26 | 0.060 | 4.38 | 2.47 | 1 | 11 |
| Geography Club | 13 | 0.0013 | 1 | 0.0023 | 13 | . | 13 | 13 |
| German | 74 | 0.0072 | 21 | 0.048 | 3.52 | 2.69 | 1 | 11 |
| History | 64 | 0.0062 | 11 | 0.025 | 5.82 | 10.5 | 1 | 37 |
| Latin | 450 | 0.044 | 68 | 0.16 | 6.62 | 5.66 | 1 | 27 |
| Math | 79 | 0.0077 | 17 | 0.039 | 4.65 | 2.85 | 1 | 12 |
| Science | 448 | 0.043 | 73 | 0.17 | 6.14 | 6.43 | 1 | 32 |
| Spanish | 270 | 0.026 | 50 | 0.11 | 5.40 | 4.65 | 1 | 23 |
| English | 56 | 0.0054 | 8 | 0.018 | 7 | 9.35 | 2 | 30 |
| Other School Subject Clubs | 32 | 0.0031 | 11 | 0.025 | 2.91 | 1.76 | 1 | 7 |
| Future Business Leaders Association | 152 | 0.015 | 17 | 0.039 | 8.94 | 7.12 | 1 | 26 |
| Future Farmers of America/Dairy Herd Improvement Association | 781 | 0.076 | 205 | 0.47 | 3.81 | 2.23 | 1 | 15 |
| Future Homemakers of America | 948 | 0.092 | 181 | 0.42 | 5.24 | 3.15 | 1 | 17 |
| Future Nurses of America | 139 | 0.013 | 38 | 0.087 | 3.66 | 3.30 | 1 | 12 |
| Future Teachers of America | 383 | 0.037 | 72 | 0.17 | 5.32 | 4.85 | 1 | 26 |
| Junior Achievement | 1 | 0.000097 | 1 | 0.0023 | 1 | . | 1 | 1 |
| Other Occupational Club | 276 | 0.027 | 48 | 0.11 | 5.75 | 6.22 | 1 | 36 |
| Industrial Arts Club | 20 | 0.0019 | 5 | 0.011 | 4 | 2.35 | 2 | 8 |
| Art Club | 225 | 0.022 | 62 | 0.14 | 3.63 | 3.41 | 1 | 14 |
| Camera Club/Photography | 403 | 0.039 | 106 | 0.24 | 3.80 | 3.27 | 1 | 16 |
| Chess Club | 26 | 0.0025 | 13 | 0.030 | 2 | 1.15 | 1 | 5 |
| Dance Club | 217 | 0.021 | 28 | 0.064 | 7.75 | 10.8 | 1 | 46 |
| Field and Stream Club | 135 | 0.013 | 24 | 0.055 | 5.63 | 6.29 | 1 | 28 |
| Home Economics Club | 318 | 0.031 | 37 | 0.085 | 8.59 | 9.82 | 1 | 45 |
| Inventor's Club | 2 | 0.00019 | 1 | 0.0023 | 2 | . | 2 | 2 |
| Music Club | 125 | 0.012 | 22 | 0.051 | 5.68 | 6.64 | 1 | 27 |
| Nature/Horticulture Club | 34 | 0.0033 | 9 | 0.021 | 3.78 | 4.21 | 1 | 14 |
| Radio/T.V. Club | 102 | 0.0099 | 35 | 0.080 | 2.91 | 2.61 | 1 | 14 |
| Stage Crew | 284 | 0.028 | 71 | 0.16 | 4 | 4.40 | 1 | 24 |
| Stamp/Coin Club | 9 | 0.00087 | 5 | 0.011 | 1.80 | 1.10 | 1 | 3 |
| Other Hobby Club | 468 | 0.045 | 47 | 0.11 | 9.96 | 20.5 | 1 | 136 |
| Conservation Club | 189 | 0.018 | 42 | 0.097 | 4.50 | 5.34 | 1 | 31 |
| Diversity Clubs | 89 | 0.0086 | 13 | 0.030 | 6.85 | 4.45 | 1 | 15 |
| Forestry Club | 43 | 0.0042 | 7 | 0.016 | 6.14 | 2.79 | 2 | 11 |
| Red Cross | 233 | 0.023 | 42 | 0.097 | 5.55 | 6.28 | 1 | 34 |
| Religious Service Clubs | 856 | 0.083 | 63 | 0.14 | 13.6 | 14.4 | 1 | 52 |
| Teens Against Polio | 5 | 0.00048 | 4 | 0.0092 | 1.25 | 0.50 | 1 | 2 |
| Other Service Clubs | 553 | 0.054 | 66 | 0.15 | 8.38 | 12.9 | 1 | 87 |
| Other Political Groups | 11 | 0.0011 | 5 | 0.011 | 2.20 | 2.17 | 1 | 6 |

This table lists summary statistics for each extracurricular.

Table 2a: Reduced Form Effects of Any Friend Attending College

| | Considered College | | Any College Applications | | Number of College Applications | | Will Attend College Year After HS Graduation | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Any Friends Attending College After HS Graduation | 0.0866*** | 0.0827*** | 0.153*** | 0.138*** | 0.183*** | 0.164*** | 0.153*** | 0.128*** |
| | (0.0132) | (0.0138) | (0.0148) | (0.0156) | (0.0253) | (0.0262) | (0.0146) | (0.0154) |
| Male | 0.0425*** | 0.0454*** | −0.0476*** | −0.0399** | −0.0293 | 0.00521 | 0.0403*** | 0.0500*** |
| | (0.0133) | (0.0143) | (0.0149) | (0.0162) | (0.0254) | (0.0272) | (0.0146) | (0.0160) |
| IQ | 0.00450*** | 0.00496*** | 0.00218*** | 0.00165** | 0.00447*** | 0.00368*** | 0.00350*** | 0.00352*** |
| | (0.000560) | (0.000594) | (0.000628) | (0.000673) | (0.00107) | (0.00113) | (0.000616) | (0.000662) |
| GPA Percentile within HS | 0.00289*** | 0.00274*** | 0.00394*** | 0.00419*** | 0.00467*** | 0.00523*** | 0.00469*** | 0.00489*** |
| | (0.000293) | (0.000310) | (0.000328) | (0.000351) | (0.000561) | (0.000591) | (0.000322) | (0.000346) |
| Number of Siblings | −0.00589** | −0.00689** | −0.0126*** | −0.0131*** | −0.0175*** | −0.0192*** | −0.0146*** | −0.0156*** |
| | (0.00258) | (0.00271) | (0.00291) | (0.00309) | (0.00497) | (0.00519) | (0.00283) | (0.00302) |
| Mother Education > HS | 0.0362** | 0.0393** | 0.133*** | 0.139*** | 0.191*** | 0.180*** | 0.178*** | 0.186*** |
| | (0.0156) | (0.0163) | (0.0171) | (0.0180) | (0.0294) | (0.0303) | (0.0172) | (0.0181) |
| Self Assessed Relative Wealth (1-5) | 0.0272** | 0.0272** | 0.0758*** | 0.0723*** | 0.152*** | 0.117*** | 0.0633*** | 0.0653*** |
| | (0.0111) | (0.0116) | (0.0123) | (0.0130) | (0.0209) | (0.0217) | (0.0122) | (0.0129) |
| Size of High School Class (1957) | 0.0000420 | −0.0458 | −0.0000557 | 0.130 | −0.000272* | −0.240 | −0.0000259 | 0.0176 |
| | (0.0000772) | (0.0354) | (0.0000856) | (52.74) | (0.000147) | (0.353) | (0.0000848) | (8.063) |
| Percent of 1957 Graduates Attending College | 0.111** | 8.958* | 0.339*** | −6.795 | 0.746*** | 18.51 | 0.372*** | 2.331 |
| | (0.0452) | (4.958) | (0.0502) | (3477.8) | (0.0855) | (28.11) | (0.0497) | (804.2) |
| College Not In Town, Within 15 Miles | −0.00288 | −11.69* | 0.0632** | 1.153 | 0.0635 | −18.09 | 0.00891 | −1.401 |
| | (0.0225) | (6.746) | (0.0251) | (2466.1) | (0.0426) | (26.28) | (0.0247) | (1581.9) |
| College/University > 15 Miles Away | 0.0288 | −0.0874 | 0.0790*** | 4.168 | 0.0262 | −4.282 | 0.0372 | −0.799 |
| | (0.0245) | (0.533) | (0.0272) | (1243.9) | (0.0465) | (6.317) | (0.0269) | (75.19) |
| Any College Preparatory Classes Reported | −0.0519* | 6.846 | 0.0685* | 8.070 | 0.0940 | 1.736 | −0.00208 | 0.427 |
| | (0.0313) | (4.711) | (0.0355) | (1157.4) | (0.0613) | (2.402) | (0.0344) | (1102.1) |
| HS Seniors Per Teacher | −0.00333 | −0.426* | −0.00197 | −0.485 | −0.000995 | −0.00818 | −0.00116 | 0.0805 |
| | (0.00281) | (0.253) | (0.00315) | (82.03) | (0.00539) | (0.222) | (0.00309) | (83.59) |
| Average Teacher Post-HS Schooling | 0.0130 | −3.319* | 0.0570 | 18.81 | 0.115* | −27.06 | 0.0335 | 0.775 |
| | (0.0317) | (1.704) | (0.0355) | (6641.7) | (0.0604) | (38.95) | (0.0348) | (435.4) |
| Average Teacher Pay (in $1000s) | −0.0459 | −12.71* | 0.0307 | 13.78 | 0.0973* | −33.62 | −0.0637** | −3.482 |
| | (0.0290) | (7.114) | (0.0326) | (6553.3) | (0.0560) | (49.56) | (0.0318) | (1599.0) |
| Total Spending (in $1,000,000s) | 0.00685 | 70.95 | −0.00694 | −6.846 | −0.0184 | 119.4 | 0.00153 | −0.194 |
| | (0.00835) | (44.23) | (0.00928) | (16187.7) | (0.0160) | (171.8) | (0.00916) | (10819.0) |
| Town Population 1000-2499 | 0.00362 | −5.966 | 0.0131 | −3.831 | −0.0547 | −4.758 | 0.0217 | −0.578 |
| | (0.0272) | (4.144) | (0.0307) | (62.21) | (0.0529) | (7.395) | (0.0299) | (788.8) |
| Town Population 2500-9999 | 0.0321 | −5.428 | 0.0378 | −17.17 | −0.0544 | 11.72 | 0.0222 | −0.224 |
| | (0.0266) | (4.163) | (0.0299) | (4426.6) | (0.0516) | (16.92) | (0.0293) | (788.8) |
| Town Population 10,000-24,999 | 0.0464 | 5.577 | 0.0623 | −15.71 | −0.0130 | 28.65 | 0.0555 | −1.421 |
| | (0.0341) | (3.462) | (0.0380) | (6338.4) | (0.0654) | (40.90) | (0.0374) | (1020.6) |
| Town Population 25,000-49,999 | 0.0965** | −5.484 | 0.0295 | −16.73 | −0.141* | 12.25 | 0.0767* | 0.371 |
| | (0.0380) | (4.180) | (0.0423) | (4426.6) | (0.0733) | (16.93) | (0.0417) | (788.8) |
| Town Population 50,000-99,999 | 0.113** | −63.08 | 0.102** | −58.80 | −0.0280 | −31.99 | 0.138*** | 1.305 |
| | (0.0448) | (41.08) | (0.0499) | (6097.2) | (0.0860) | (43.01) | (0.0492) | (9950.7) |
| Town Population 100,000-150,000 (Madison) | 0.105* | −85.78 | 0.0598 | −58.15 | −0.198* | −64.45 | 0.0936 | −1.409 |
| | (0.0584) | (54.02) | (0.0651) | (1930.0) | (0.112) | (90.10) | (0.0642) | (13040.5) |
| Town Population 150,000+ (Milwaukee) | 0.0568 | −783.1 | 0.0404 | −22.30 | −0.0719 | −1199.5 | 0.0599 | −2.683 |
| | (0.0941) | (488.7) | (0.104) | (146879.8) | (0.180) | (1722.0) | (0.103) | (119307.3) |
| Constant | 0.173 | 62.68** | −0.996*** | −128.8 | −2.038*** | 236.1 | −0.513*** | 7.940 |
| | (0.159) | (31.91) | (0.177) | (51711.3) | (0.301) | (344.8) | (0.175) | (8304.9) |
| HS Fixed Effects | *No* | *Yes* | *No* | *Yes* | *No* | *Yes* | *No* | *Yes* |
| Observations | 3815 | 3815 | 3553 | 3553 | 3440 | 3440 | 3798 | 3798 |

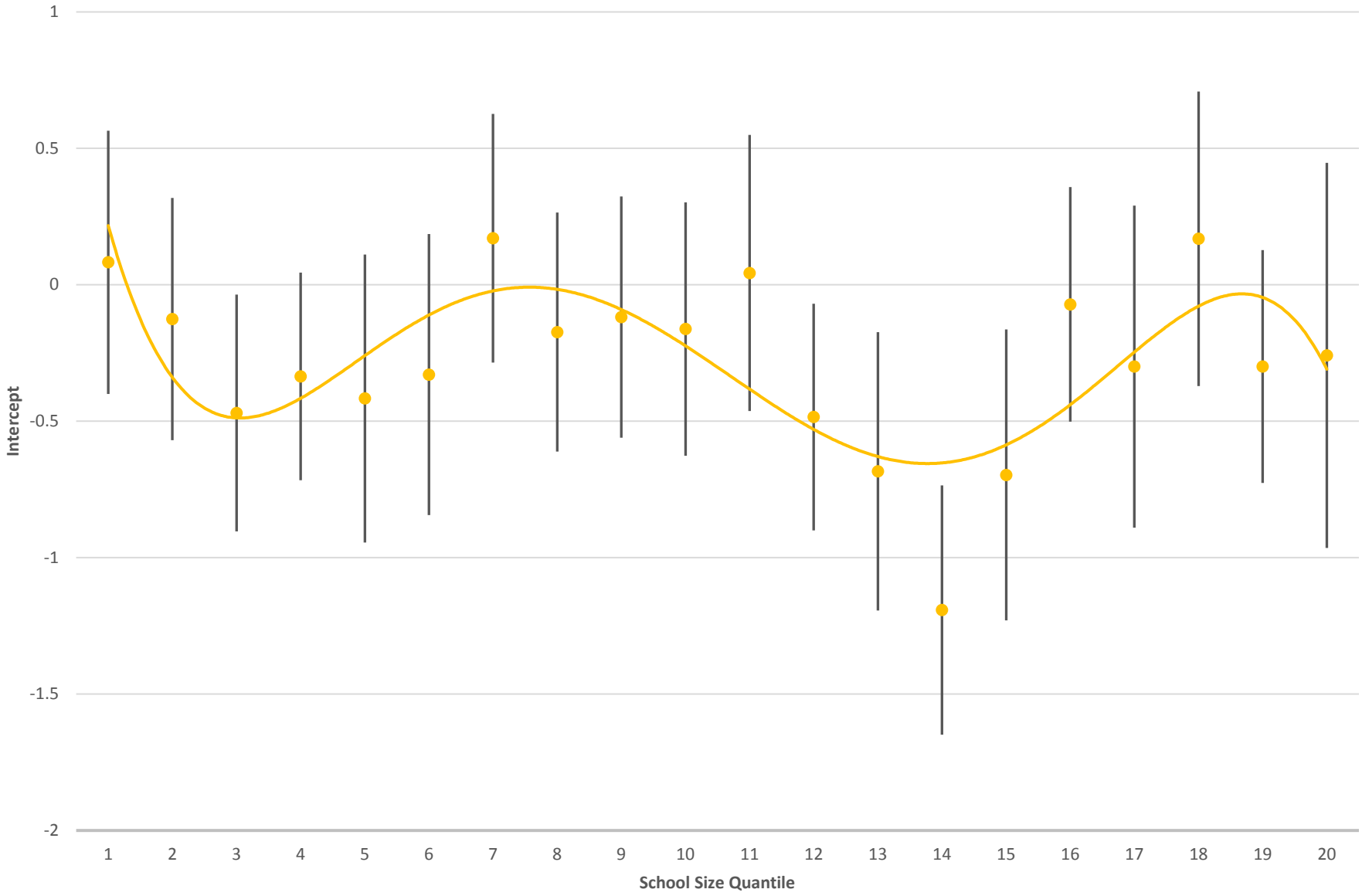
This table gives reduced form estimates of the effect of having any friends attending college on various college-going outcomes. Standard errors are clustered at the high school level.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 2b: Reduced Form Effects of Number of Friends Attending College

| | Considered College | | Any College Applications | | Number of College Applications | | Will Attend College Year After HS Graduation | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Number of Friends Attending College After HS Graduation | 0.0569*** | 0.0535*** | 0.118*** | 0.106*** | 0.148*** | 0.128*** | 0.116*** | 0.0954*** |
| | (0.0102) | (0.0107) | (0.0113) | (0.0120) | (0.0193) | (0.0201) | (0.0112) | (0.0119) |
| Male | 0.0427*** | 0.0458*** | −0.0467*** | −0.0392** | −0.0278 | 0.00612 | 0.0409*** | 0.0505*** |
| | (0.0133) | (0.0144) | (0.0149) | (0.0162) | (0.0253) | (0.0272) | (0.0146) | (0.0160) |
| IQ | 0.00457*** | 0.00504*** | 0.00223*** | 0.00171** | 0.00449*** | 0.00372*** | 0.00356*** | 0.00358*** |
| | (0.000561) | (0.000594) | (0.000627) | (0.000672) | (0.00107) | (0.00113) | (0.000616) | (0.000662) |
| GPA Percentile within HS | 0.00290*** | 0.00275*** | 0.00389*** | 0.00414*** | 0.00459*** | 0.00517*** | 0.00466*** | 0.00487*** |
| | (0.000294) | (0.000311) | (0.000328) | (0.000352) | (0.000561) | (0.000592) | (0.000323) | (0.000346) |
| Number of Siblings | −0.00602** | −0.00715*** | −0.0125*** | −0.0132*** | −0.0174*** | −0.0194*** | −0.0146*** | −0.0158*** |
| | (0.00258) | (0.00272) | (0.00291) | (0.00309) | (0.00496) | (0.00518) | (0.00284) | (0.00302) |
| Mother Education > HS | 0.0351** | 0.0381** | 0.129*** | 0.135*** | 0.186*** | 0.175*** | 0.174*** | 0.183*** |
| | (0.0157) | (0.0163) | (0.0172) | (0.0180) | (0.0295) | (0.0304) | (0.0172) | (0.0182) |
| Self Assessed Relative Wealth (1-5) | 0.0277** | 0.0280** | 0.0757*** | 0.0726*** | 0.152*** | 0.117*** | 0.0634*** | 0.0658*** |
| | (0.0111) | (0.0116) | (0.0123) | (0.0130) | (0.0209) | (0.0217) | (0.0122) | (0.0129) |
| Size of High School Class (1957) | 0.0000394 | −0.0456 | −0.0000613 | 0.146 | −0.000275* | −0.267 | −0.0000303 | 0.0181 |
| | (0.0000773) | (0.0355) | (0.0000856) | (53.36) | (0.000147) | (0.353) | (0.0000848) | (8.250) |
| Percent of 1957 Graduates Attending College | 0.117** | 8.970* | 0.335*** | −7.728 | 0.738*** | 20.51 | 0.370*** | 2.327 |
| | (0.0453) | (4.966) | (0.0502) | (3518.6) | (0.0855) | (28.11) | (0.0497) | (822.8) |
| College Not In Town, Within 15 Miles | −0.00322 | −11.75* | 0.0623** | 1.278 | 0.0629 | −20.19 | 0.00864 | −1.423 |
| | (0.0226) | (6.758) | (0.0250) | (2495.0) | (0.0426) | (26.28) | (0.0247) | (1618.4) |
| College/University > 15 Miles Away | 0.0282 | −0.0991 | 0.0763*** | 4.636 | 0.0233 | −4.821 | 0.0351 | −0.826 |
| | (0.0245) | (0.534) | (0.0272) | (1258.5) | (0.0465) | (6.318) | (0.0269) | (76.93) |
| Any College Preparatory Classes Reported | −0.0521* | 6.887 | 0.0677* | 9.050 | 0.0929 | 1.925 | −0.00250 | 0.425 |
| | (0.0314) | (4.719) | (0.0354) | (1170.9) | (0.0612) | (2.402) | (0.0344) | (1127.6) |
| HS Seniors Per Teacher | −0.00318 | −0.430* | −0.00167 | −0.559 | −0.000632 | −0.0273 | −0.000921 | 0.0777 |
| | (0.00281) | (0.254) | (0.00315) | (82.99) | (0.00538) | (0.222) | (0.00309) | (85.52) |
| Average Teacher Post-HS Schooling | 0.0148 | −3.288* | 0.0620* | 21.16 | 0.120** | −30.15 | 0.0382 | 0.800 |
| | (0.0318) | (1.707) | (0.0355) | (6719.7) | (0.0604) | (38.96) | (0.0349) | (445.4) |
| Average Teacher Pay (in $1000s) | −0.0468 | −12.78* | 0.0292 | 15.45 | 0.0950* | −37.48 | −0.0656** | −3.517 |
| | (0.0290) | (7.127) | (0.0326) | (6630.2) | (0.0559) | (49.57) | (0.0318) | (1636.0) |
| Total Spending (in $1,000,000s) | 0.00665 | 71.25 | −0.00730 | −7.746 | −0.0188 | 133.1 | 0.00131 | −0.201 |
| | (0.00836) | (44.31) | (0.00927) | (16377.7) | (0.0160) | (171.8) | (0.00917) | (11069.2) |
| Town Population 1000-2499 | 0.00298 | −5.978 | 0.0114 | −4.226 | −0.0571 | −5.208 | 0.0193 | −0.557 |
| | (0.0273) | (4.151) | (0.0307) | (62.94) | (0.0528) | (7.395) | (0.0300) | (807.0) |
| Town Population 2500-9999 | 0.0320 | −5.465 | 0.0350 | −19.26 | −0.0583 | 13.11 | 0.0200 | −0.232 |
| | (0.0267) | (4.170) | (0.0299) | (4478.6) | (0.0516) | (16.92) | (0.0293) | (807.0) |
| Town Population 10,000-24,999 | 0.0474 | 5.573 | 0.0606 | −17.69 | −0.0144 | 31.94 | 0.0542 | −1.453 |
| | (0.0341) | (3.469) | (0.0380) | (6412.8) | (0.0653) | (40.91) | (0.0374) | (1044.2) |
| Town Population 25,000-49,999 | 0.0968** | −5.537 | 0.0256 | −18.85 | −0.146** | 13.61 | 0.0743* | 0.341 |
| | (0.0381) | (4.187) | (0.0423) | (4478.6) | (0.0732) | (16.93) | (0.0417) | (807.0) |
| Town Population 50,000-99,999 | 0.114** | −63.43 | 0.101** | −66.01 | −0.0294 | −35.60 | 0.138*** | 1.279 |
| | (0.0449) | (41.15) | (0.0499) | (6168.8) | (0.0860) | (43.02) | (0.0492) | (10180.9) |
| Town Population 100,000-150,000 (Madison) | 0.107* | −86.25 | 0.0610 | −65.36 | −0.197* | −71.87 | 0.0961 | −1.487 |
| | (0.0585) | (54.12) | (0.0650) | (1952.7) | (0.112) | (90.12) | (0.0642) | (13342.1) |
| Town Population 150,000+ (Milwaukee) | 0.0576 | −786.7 | 0.0374 | −24.67 | −0.0752 | −1337.1 | 0.0567 | −2.784 |
| | (0.0942) | (489.6) | (0.104) | (148603.6) | (0.180) | (1722.3) | (0.103) | (122067.0) |
| Constant | 0.166 | 62.86** | −1.006*** | −144.3 | −2.043*** | 263.6 | −0.521*** | 8.032 |
| | (0.159) | (31.97) | (0.177) | (52318.2) | (0.301) | (344.9) | (0.175) | (8497.0) |
| HS Fixed Effects | *No* | *Yes* | *No* | *Yes* | *No* | *Yes* | *No* | *Yes* |
| Observations | 3815 | 3815 | 3553 | 3553 | 3440 | 3440 | 3798 | 3798 |

This table gives reduced form estimates of the effect of a student's number of friends attending college on various college-going outcomes. Standard errors are clustered at the high school level.
* p < 0.10, ** p < 0.05, *** p < 0.01

Figure 1: Intercepts from Regressing College Friends on IQ within School Size Quantiles



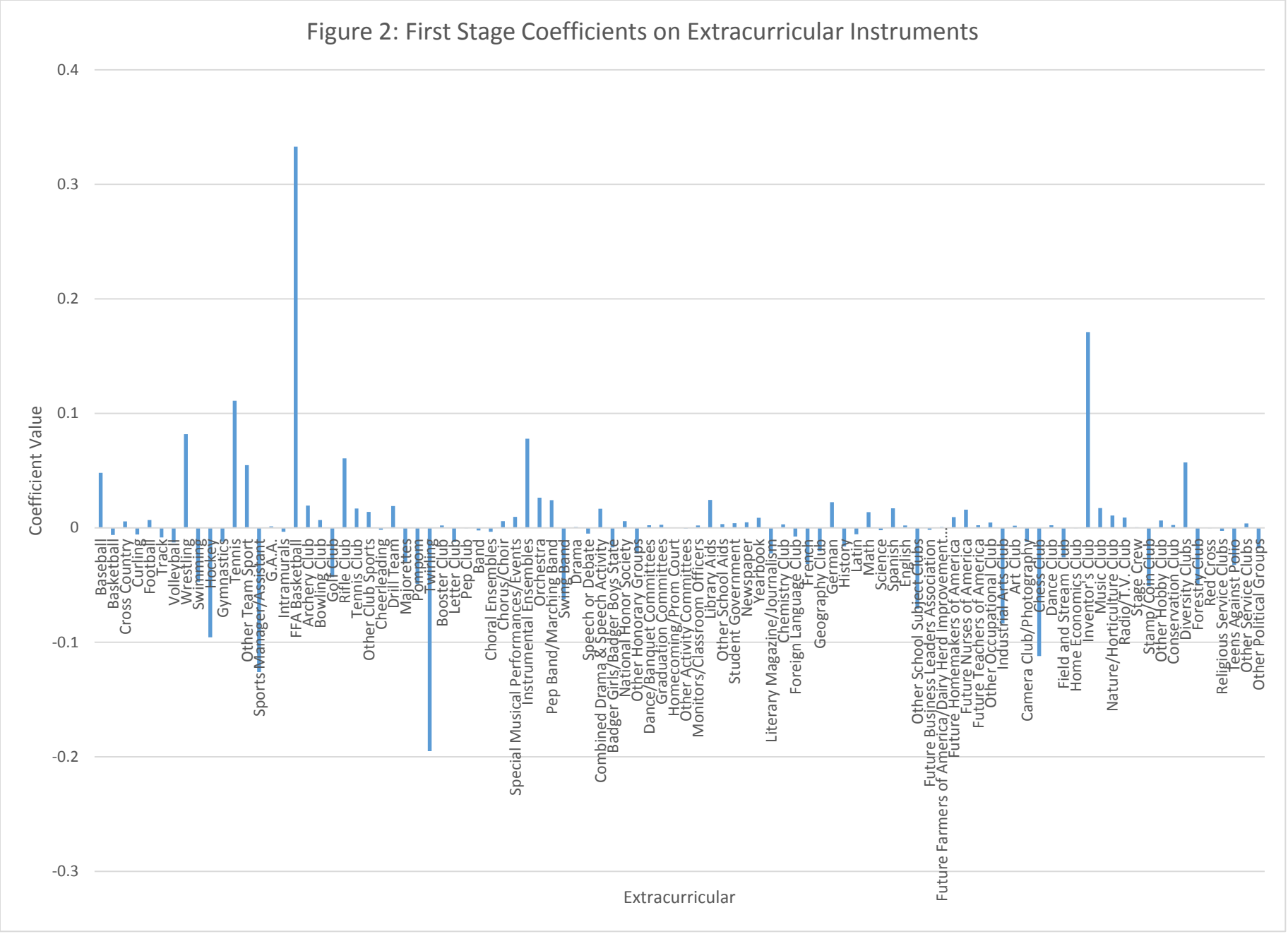


Figure 2: First Stage Coefficients on Extracurricular Instruments
Coefficient Value
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
Extracurricular
Baseball
Basketball
Cross Country
Curling
Footbal
Track
Volleyball
Wrestling
Swimming
Hockey
Gymnastics
Tennis
Other Team Sport
Sports Manager/Assistant
G.A.A.
Intramurals
FFA Basketball
Archery Club
Bowling Club
Golf Club
Rifle Club
Tennis Club
Other Club Sports
Cheerleading
Drill Team
Majorettes
Pompom
Twirling
Booster Club
Letter Club
Pep Club
Band
Choral Ensembles
Chorus/Choir
Special Musical Performances/Events
Instrumental Ensembles
Orchestra
Pep Band/Marching Band
Swing Band
Drama
Speech or Debate
Combined Drama & Speech Activity
Badger Girls/Badger Boys State
National Honor Society
Other Honorary Groups
Dance/Banquet Committees
Graduation Committees
Homecoming/Prom Court
Other Activity Committees
Monitors/Classroom Officers
Library Aids
Other School Aids
Student Government
Newspaper
Yearbook
Literary Magazine/Journalism
Chemistry Club
Foreign Language Club
French
Geography Club
German
History
Latin
Math
Science
Spanish
English
Other School Subject Clubs
Future Business Leaders Association
Future Farmers of America/Dairy Herd Improvement...
Future Homemakers of America
Future Nurses of America
Future Teachers of America
Other Occupational Club
Industrial Arts Club
Art Club
Camera Club/Photography
Chess Club
Dance Club
Field and Stream Club
Home Economics Club
Inventor's Club
Music Club
Nature/Horticulture Club
Radio/T.V. Club
Stage Crew
Stamp/Coin Club
Other Hobby Club
Conservation Club
Diversity Clubs
Forestry Club
Red Cross
Religious Service Clubs
Teens Against Polio
Other Service Clubs
Other Political Groups

Table 3: First Stage, High School Size

| | Dependant Variable: Any Friend Attending College | | | Dependant Variable: Number of Friends Attending College | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Any Friends Attending College After HS Graduation | | | | | | |
| Number of Friends Attending College After HS Graduation | | | | | | |
| High School Class Size x $10^{-3}$ | $-0.917^{*}$ | $-6.491^{***}$ | $-16.93$ | $-1.300^{**}$ | $-7.841^{***}$ | $-31.93$ |
| | (0.476) | (1.863) | (17.56) | (0.563) | (2.331) | (21.04) |
| (High School Class Size)$^2$ x $10^{-6}$ | | $12.30^{***}$ | 197.3 | | $14.51^{***}$ | 380.9 |
| | | (3.987) | (222.1) | | (4.864) | (268.4) |
| (High School Class Size)$^3$ x $10^{-8}$ | | | $-126.4$ | | | $-225.3$ |
| | | | (118.4) | | | (144.8) |
| (High School Class Size)$^4$ x $10^{-10}$ | | | 35.25 | | | $58.51^{*}$ |
| | | | (27.58) | | | (34.28) |
| (High School Class Size)$^5$ x $10^{-14}$ | | | $-337.8$ | | | $-533.6^{*}$ |
| | | | (231.1) | | | (292.3) |
| IQ x HS Size x $10^{-3}$ | $0.00838^{*}$ | $0.0560^{***}$ | 0.180 | $0.0123^{**}$ | $0.0709^{***}$ | $0.351^{*}$ |
| | (0.00432) | (0.0171) | (0.168) | (0.00512) | (0.0219) | (0.206) |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | $-0.107^{***}$ | $-2.083$ | | $-0.131^{***}$ | $-4.209$ |
| | | (0.0372) | (2.129) | | (0.0461) | (2.625) |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | 1.290 | | | $2.449^{*}$ |
| | | | (1.135) | | | (1.413) |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | $-0.352$ | | | $-0.629^{*}$ |
| | | | (0.264) | | | (0.334) |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | 3.347 | | | $5.699^{**}$ |
| | | | (2.212) | | | (2.851) |
| Male | $-0.00910$ | $-0.00849$ | $-0.00890$ | $-0.0176$ | $-0.0178$ | $-0.0187$ |
| | (0.0208) | (0.0208) | (0.0210) | (0.0274) | (0.0274) | (0.0275) |
| IQ | $0.00196^{**}$ | $-0.00136$ | $-0.00380$ | 0.00185 | $-0.00224$ | $-0.00819$ |
| | (0.000982) | (0.00142) | (0.00431) | (0.00122) | (0.00189) | (0.00521) |
| GPA Percentile within HS | $0.00246^{***}$ | $0.00249^{***}$ | $0.00247^{***}$ | $0.00356^{***}$ | $0.00358^{***}$ | $0.00353^{***}$ |
| | (0.000338) | (0.000341) | (0.000342) | (0.000488) | (0.000489) | (0.000494) |
| Number of Siblings | $-0.0135^{***}$ | $-0.0134^{***}$ | $-0.0134^{***}$ | $-0.0182^{***}$ | $-0.0182^{***}$ | $-0.0180^{***}$ |
| | (0.00308) | (0.00309) | (0.00309) | (0.00392) | (0.00393) | (0.00393) |
| Mother Education > HS | $0.0671^{***}$ | $0.0673^{***}$ | $0.0675^{***}$ | $0.122^{***}$ | $0.122^{***}$ | $0.123^{***}$ |
| | (0.0167) | (0.0168) | (0.0168) | (0.0245) | (0.0247) | (0.0248) |
| Self Assessed Relative Wealth (1-5) | $0.0425^{***}$ | $0.0418^{***}$ | $0.0416^{***}$ | $0.0553^{***}$ | $0.0539^{***}$ | $0.0525^{***}$ |
| | (0.0131) | (0.0130) | (0.0130) | (0.0177) | (0.0176) | (0.0176) |
| Town Population 1000-2499 | 0.0426 | 0.0523 | 0.0414 | $0.0761^{*}$ | $0.0837^{*}$ | 0.0757 |
| | (0.0335) | (0.0345) | (0.0389) | (0.0432) | (0.0440) | (0.0490) |
| Town Population 2500-9999 | $0.0868^{***}$ | $0.118^{***}$ | $0.0950^{**}$ | $0.134^{***}$ | $0.159^{***}$ | $0.146^{**}$ |
| | (0.0302) | (0.0354) | (0.0448) | (0.0425) | (0.0475) | (0.0591) |
| Town Population 10,000-24,999 | $0.134^{***}$ | $0.177^{***}$ | $0.159^{***}$ | $0.186^{***}$ | $0.221^{***}$ | $0.225^{***}$ |
| | (0.0403) | (0.0500) | (0.0586) | (0.0519) | (0.0659) | (0.0782) |
| Town Population 25,000-49,999 | $0.130^{***}$ | $0.172^{***}$ | $0.174^{**}$ | $0.193^{***}$ | $0.225^{***}$ | $0.273^{***}$ |
| | (0.0455) | (0.0561) | (0.0703) | (0.0582) | (0.0721) | (0.0890) |
| Town Population 50,000-99,999 | $0.146^{***}$ | $0.199^{***}$ | $0.203^{***}$ | $0.194^{***}$ | $0.237^{***}$ | $0.282^{***}$ |
| | (0.0529) | (0.0633) | (0.0749) | (0.0681) | (0.0847) | (0.0980) |
| Town Population 100,000-150,000 (Madison) | 0.0687 | $0.125^{*}$ | 0.133 | 0.0672 | 0.110 | 0.154 |
| | (0.0602) | (0.0747) | (0.0876) | (0.0829) | (0.106) | (0.118) |
| Town Population 150,000+ (Milwaukee) | $0.195^{***}$ | $0.237^{***}$ | $0.236^{***}$ | $0.283^{***}$ | $0.318^{***}$ | $0.346^{***}$ |
| | (0.0651) | (0.0777) | (0.0834) | (0.0831) | (0.0998) | (0.103) |
| Percent of 1957 Graduates Attending College | $0.558^{***}$ | $0.543^{***}$ | $0.528^{***}$ | $0.758^{***}$ | $0.747^{***}$ | $0.730^{***}$ |
| | (0.0519) | (0.0544) | (0.0555) | (0.0758) | (0.0779) | (0.0791) |
| College Not In Town, Within 15 Miles | $-0.0198$ | $-0.0155$ | $-0.00834$ | $-0.0240$ | $-0.0207$ | 0.000447 |
| | (0.0286) | (0.0283) | (0.0302) | (0.0364) | (0.0362) | (0.0381) |
| College/University > 15 Miles Away | 0.0312 | 0.0338 | 0.0384 | 0.0588 | 0.0604 | $0.0758^{*}$ |
| | (0.0331) | (0.0328) | (0.0334) | (0.0421) | (0.0420) | (0.0425) |
| Any College Preparatory Classes Reported | 0.00399 | 0.0101 | 0.00603 | 0.00951 | 0.0164 | 0.00774 |
| | (0.0420) | (0.0432) | (0.0434) | (0.0527) | (0.0534) | (0.0543) |
| HS Seniors Per Teacher | 0.00290 | 0.00443 | 0.00255 | 0.00182 | 0.00309 | 0.000733 |
| | (0.00432) | (0.00444) | (0.00485) | (0.00591) | (0.00618) | (0.00690) |
| Average Teacher Post-HS Schooling | $-0.0446$ | $-0.0290$ | $-0.0259$ | $-0.100$ | $-0.0897$ | $-0.0914$ |
| | (0.0624) | (0.0631) | (0.0630) | (0.0814) | (0.0835) | (0.0835) |
| Average Teacher Pay (in $1000s) | 0.00196 | $-0.00181$ | $-0.00740$ | 0.0190 | 0.0157 | $-0.00356$ |
| | (0.0416) | (0.0418) | (0.0433) | (0.0550) | (0.0556) | (0.0570) |
| Total Spending (in $1,000,000s) | $-0.00696$ | $-0.00781$ | $-0.00793$ | $-0.00718$ | $-0.00786$ | $-0.00646$ |
| | (0.00729) | (0.00770) | (0.00789) | (0.00968) | (0.0101) | (0.0101) |
| Constant | $-0.0915$ | 0.187 | 0.422 | $-0.0285$ | 0.349 | 0.969 |
| | (0.290) | (0.309) | (0.495) | (0.389) | (0.429) | (0.610) |
| Observations | 3815 | 3815 | 3815 | 3815 | 3815 | 3815 |
| $R^2$ | 0.132 | 0.134 | 0.136 | 0.144 | 0.146 | 0.149 |
| F-Statistic, Test: Instrument Effect = 0 | 3.716 | 6.643 | 4.045 | 5.330 | 6.349 | 3.704 |

This table gives the first stage results from regressing college friend outcomes on high school size instruments and controls. The F-statistic from a joint test of all instrument coefficients being equal to zero is reported for each regression. All standard errors are clustered at the high school level.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 4: Instrumental Variables Estimates of the Effect of Any Friend Attending College on Considering College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Any Friends Attending College After HS Graduation | −0.540 | −0.0477 | 0.0796 | 0.0133 | 0.0161 | 0.00431 | −0.00954 |
| | (0.518) | (0.233) | (0.249) | (0.167) | (0.115) | (0.111) | (0.113) |
| Male | 0.0374* | 0.0412*** | 0.0424*** | 0.0657*** | 0.0744*** | 0.0706*** | 0.0845*** |
| | (0.0204) | (0.0143) | (0.0137) | (0.0196) | (0.0201) | (0.0203) | (0.0205) |
| IQ | 0.00661*** | 0.00486*** | 0.00315*** | 0.00421*** | 0.00402*** | 0.00440*** | 0.00469*** |
| | (0.00196) | (0.00102) | (0.00110) | (0.000731) | (0.000634) | (0.000639) | (0.000619) |
| GPA Percentile within HS | 0.00443*** | 0.00322*** | 0.00288*** | 0.00288*** | 0.00288*** | 0.00277*** | 0.00277*** |
| | (0.00131) | (0.000652) | (0.000685) | (0.000447) | (0.000389) | (0.000386) | (0.000361) |
| Number of Siblings | −0.0143** | −0.00773* | −0.00605 | −0.00490 | −0.00517* | −0.00518* | −0.00586** |
| | (0.00721) | (0.00407) | (0.00435) | (0.00333) | (0.00302) | (0.00303) | (0.00288) |
| Mother Education > HS | 0.0785** | 0.0454** | 0.0381* | 0.0284* | 0.0243* | 0.0214 | 0.0245* |
| | (0.0375) | (0.0202) | (0.0212) | (0.0153) | (0.0140) | (0.0140) | (0.0139) |
| Self Assessed Relative Wealth (1-5) | 0.0542** | 0.0327** | 0.0275* | 0.0265** | 0.0261** | 0.0244** | 0.0215** |
| | (0.0269) | (0.0154) | (0.0164) | (0.0116) | (0.0108) | (0.0108) | (0.0108) |
| Percent of 1957 Graduates Attending College | 0.457 | 0.187 | 0.114 | 0.127 | 0.0966 | 0.181* | |
| | (0.288) | (0.132) | (0.136) | (0.101) | (0.0977) | (0.102) | |
| Any College Preparatory Classes Reported | −0.0512 | −0.0511* | −0.0557* | −0.0652** | −0.0627* | −0.0742** | |
| | (0.0367) | (0.0293) | (0.0299) | (0.0328) | (0.0339) | (0.0341) | |
| HS Seniors Per Teacher | −0.00166 | −0.00303 | −0.00537* | −0.00455 | −0.00623 | −0.00651 | |
| | (0.00419) | (0.00309) | (0.00306) | (0.00301) | (0.00416) | (0.00409) | |
| Average Teacher Post-HS Schooling | −0.0138 | 0.00496 | 0.0153 | 0.0312 | 0.0421 | 0.0396 | |
| | (0.0490) | (0.0334) | (0.0339) | (0.0337) | (0.0489) | (0.0554) | |
| Average Teacher Pay (in $1000s) | −0.0455 | −0.0438 | −0.0463 | −0.0572* | −0.0363 | −0.0348 | |
| | (0.0386) | (0.0283) | (0.0302) | (0.0314) | (0.0464) | (0.0474) | |
| Total Spending (in $1,000,000s) | 0.00250 | 0.00598 | 0.00773 | 0.0100 | 0.00956 | −0.0148 | |
| | (0.00751) | (0.00469) | (0.00473) | (0.00927) | (0.0145) | (0.0133) | |
| Size of High School Class (1957) | | | | 0.0742 | 0.311* | 0.348 | |
| | | | | (0.0816) | (0.166) | (0.228) | |
| IQ x HS Size x $10^{-3}$ | 0.000125 | 0.000997 | 0.0426 | | | | |
| | (0.000958) | (0.00290) | (0.0265) | | | | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | −0.00166 | −0.403 | | | | |
| | | (0.00532) | (0.298) | | | | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | 0.165 | | | | |
| | | | (0.147) | | | | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | −0.0303 | | | | |
| | | | (0.0325) | | | | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | 0.206 | | | | |
| | | | (0.263) | | | | |
| Constant | 0.0282 | 0.154 | 0.237 | 0.144 | 0.0501 | 0.0489 | 0.258*** |
| | (0.258) | (0.180) | (0.173) | (0.167) | (0.247) | (0.271) | (0.0770) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3815 | 3815 | 3815 | 3815 | 3815 | 3815 | 4121 |
| First Stage F-Statistic | 3.716 | 6.643 | 4.035 | 1.823 | 2.179 | 2.231 | 2.023 |

This table gives estimates of the effect of any friend attending college on a student considering college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 5: Instrumental Variables Estimates of the Effect of Number of Friends Attending College on Considering College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Number of Friends Attending College After HS Graduation | −0.381 | −0.0570 | 0.0540 | 0.0602 | 0.0836 | 0.0532 | 0.0411 |
| | (0.346) | (0.189) | (0.197) | (0.118) | (0.0868) | (0.0838) | (0.0827) |
| Male | 0.0356* | 0.0406*** | 0.0427*** | 0.0640*** | 0.0705*** | 0.0678*** | 0.0819*** |
| | (0.0202) | (0.0147) | (0.0139) | (0.0196) | (0.0202) | (0.0203) | (0.0205) |
| IQ | 0.00626*** | 0.00491*** | 0.00323*** | 0.00408*** | 0.00385*** | 0.00428*** | 0.00456*** |
| | (0.00157) | (0.000951) | (0.000985) | (0.000671) | (0.000617) | (0.000618) | (0.000601) |
| GPA Percentile within HS | 0.00446*** | 0.00330*** | 0.00289*** | 0.00275*** | 0.00269*** | 0.00264*** | 0.00267*** |
| | (0.00127) | (0.000738) | (0.000758) | (0.000431) | (0.000389) | (0.000384) | (0.000356) |
| Number of Siblings | −0.0139** | −0.00812* | −0.00614 | −0.00422 | −0.00427 | −0.00456 | −0.00533* |
| | (0.00673) | (0.00430) | (0.00449) | (0.00321) | (0.00298) | (0.00297) | (0.00277) |
| Mother Education > HS | 0.0885** | 0.0491* | 0.0368 | 0.0239 | 0.0190 | 0.0180 | 0.0211 |
| | (0.0438) | (0.0261) | (0.0268) | (0.0164) | (0.0146) | (0.0144) | (0.0144) |
| Self Assessed Relative Wealth (1-5) | 0.0523** | 0.0338** | 0.0280* | 0.0243** | 0.0232** | 0.0224** | 0.0193* |
| | (0.0245) | (0.0157) | (0.0164) | (0.0113) | (0.0107) | (0.0107) | (0.0106) |
| Percent of 1957 Graduates Attending College | 0.444* | 0.204 | 0.117 | 0.0906 | 0.0393 | 0.141 | |
| | (0.263) | (0.146) | (0.148) | (0.0952) | (0.0978) | (0.101) | |
| Any College Preparatory Classes Reported | −0.0497 | −0.0509* | −0.0557* | −0.0646** | −0.0632* | −0.0736** | |
| | (0.0349) | (0.0294) | (0.0299) | (0.0327) | (0.0339) | (0.0340) | |
| HS Seniors Per Teacher | −0.00254 | −0.00310 | −0.00522* | −0.00455 | −0.00572 | −0.00635 | |
| | (0.00387) | (0.00304) | (0.00312) | (0.00300) | (0.00418) | (0.00408) | |
| Average Teacher Post-HS Schooling | −0.0279 | 0.00114 | 0.0181 | 0.0361 | 0.0510 | 0.0480 | |
| | (0.0531) | (0.0369) | (0.0380) | (0.0345) | (0.0490) | (0.0566) | |
| Average Teacher Pay (in $1000s) | −0.0394 | −0.0429 | −0.0467 | −0.0567* | −0.0333 | −0.0360 | |
| | (0.0381) | (0.0287) | (0.0299) | (0.0313) | (0.0463) | (0.0472) | |
| Total Spending (in $1,000,000s) | 0.00353 | 0.00592 | 0.00744 | 0.0101 | 0.00834 | −0.0144 | |
| | (0.00650) | (0.00460) | (0.00454) | (0.00911) | (0.0144) | (0.0132) | |
| Size of High School Class (1957) | | | | 0.0710 | 0.282* | 0.332 | |
| | | | | (0.0814) | (0.164) | (0.226) | |
| IQ x HS Size x $10^{-3}$ | 0.000278 | 0.00112 | 0.0416 | | | | |
| | (0.000947) | (0.00305) | (0.0286) | | | | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | −0.00186 | −0.388 | | | | |
| | | (0.00555) | (0.321) | | | | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | 0.155 | | | | |
| | | | (0.159) | | | | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | −0.0278 | | | | |
| | | | (0.0354) | | | | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | 0.183 | | | | |
| | | | (0.290) | | | | |
| Constant | 0.0668 | 0.154 | 0.224 | 0.144 | 0.0136 | 0.0309 | 0.284*** |
| | (0.235) | (0.176) | (0.166) | (0.166) | (0.247) | (0.272) | (0.0737) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3815 | 3815 | 3815 | 3815 | 3815 | 3815 | 4121 |
| First Stage F-Statistic | 5.330 | 6.349 | 3.693 | 1.860 | 2.048 | 2.068 | 1.943 |

This table gives estimates of the effect of a student's number of friends attending college on a student considering college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6: Instrumental Variables Estimates of the Effect of Any Friend Attending College on Applying to College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Any Friends Attending College After HS Graduation | 1.853* | 1.042*** | 0.964*** | 1.379 | 0.824** | 0.928** | 0.889** |
| | (1.040) | (0.317) | (0.321) | (1.115) | (0.332) | (0.368) | (0.432) |
| Male | −0.0315 | −0.0428** | −0.0438** | −0.0420 | −0.0252 | −0.0399 | −0.0295 |
| | (0.0366) | (0.0217) | (0.0207) | (0.0535) | (0.0320) | (0.0353) | (0.0369) |
| IQ | −0.00324 | −0.00149 | −0.00132 | −0.00197 | −0.000658 | −0.000899 | −0.000977 |
| | (0.00336) | (0.00132) | (0.00152) | (0.00287) | (0.00103) | (0.00114) | (0.00123) |
| GPA Percentile within HS | −0.000283 | 0.00169* | 0.00188** | 0.000727 | 0.00168** | 0.00148* | 0.00175** |
| | (0.00272) | (0.000947) | (0.000920) | (0.00225) | (0.000804) | (0.000872) | (0.000852) |
| Number of Siblings | 0.0107 | −0.000475 | −0.00151 | 0.00400 | −0.00313 | −0.00181 | −0.00340 |
| | (0.0154) | (0.00614) | (0.00608) | (0.0134) | (0.00499) | (0.00539) | (0.00559) |
| Mother Education > HS | 0.0215 | 0.0772** | 0.0822** | 0.0499 | 0.0736*** | 0.0725*** | 0.0722*** |
| | (0.0795) | (0.0316) | (0.0332) | (0.0581) | (0.0245) | (0.0262) | (0.0268) |
| Self Assessed Relative Wealth (1-5) | −0.00546 | 0.0311 | 0.0347* | 0.0168 | 0.0362* | 0.0328 | 0.0270 |
| | (0.0577) | (0.0226) | (0.0211) | (0.0508) | (0.0196) | (0.0214) | (0.0231) |
| Percent of 1957 Graduates Attending College | −0.616 | −0.137 | −0.0833 | −0.359 | −0.0922 | −0.269 | |
| | (0.584) | (0.190) | (0.185) | (0.615) | (0.225) | (0.260) | |
| Any College Preparatory Classes Reported | 0.0924 | 0.0791* | 0.0787* | 0.104 | 0.0689 | 0.0966* | |
| | (0.0798) | (0.0474) | (0.0452) | (0.0723) | (0.0491) | (0.0544) | |
| HS Seniors Per Teacher | −0.00858 | −0.00750* | −0.00669 | −0.00551 | −0.00423 | −0.000577 | |
| | (0.00824) | (0.00446) | (0.00452) | (0.00597) | (0.00594) | (0.00624) | |
| Average Teacher Post-HS Schooling | 0.114 | 0.0572 | 0.0557 | 0.103 | 0.111 | 0.0544 | |
| | (0.115) | (0.0651) | (0.0594) | (0.0698) | (0.0674) | (0.0822) | |
| Average Teacher Pay (in $1000s) | 0.0266 | 0.0305 | 0.0310 | 0.0404 | 0.0111 | 0.0203 | |
| | (0.0768) | (0.0468) | (0.0449) | (0.0626) | (0.0670) | (0.0726) | |
| Total Spending (in $1,000,000s) | 0.00968 | 0.00305 | 0.00318 | 0.00261 | −0.00730 | 0.00795 | |
| | (0.0151) | (0.00716) | (0.00736) | (0.0146) | (0.0148) | (0.0155) | |
| Size of High School Class (1957) | | | | −0.0538 | 0.0603 | −0.133 | |
| | | | | (0.184) | (0.252) | (0.341) | |
| IQ x HS Size x $10^{-3}$ | −0.0000733 | 0.0102** | 0.0179 | | | | |
| | (0.00173) | (0.00468) | (0.0349) | | | | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | −0.0197** | −0.149 | | | | |
| | | (0.00851) | (0.404) | | | | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | 0.0724 | | | | |
| | | | (0.200) | | | | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | −0.0161 | | | | |
| | | | (0.0444) | | | | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | 0.124 | | | | |
| | | | (0.360) | | | | |
| Constant | −0.502 | −0.528* | −0.571** | −0.705** | −0.800** | −0.735* | −0.112 |
| | (0.594) | (0.295) | (0.282) | (0.350) | (0.335) | (0.388) | (0.210) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3553 | 3553 | 3553 | 3553 | 3553 | 3553 | 3824 |
| First Stage F-Statistic | 3.409 | 6.110 | 3.696 | 1.806 | 2.146 | 2.249 | 2.056 |

This table gives estimates of the effect of any friend attending college on a student applying to college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Instrumental Variables Estimates of the Effect of Number of Friends Attending College on Applying College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Number of Friends Attending College After HS Graduation | 1.347** | 0.865*** | 0.760*** | 1.188 | 0.579 | 0.647* | 0.579 |
| | (0.666) | (0.272) | (0.257) | (1.844) | (0.375) | (0.373) | (0.368) |
| Male | −0.0223 | −0.0345 | −0.0368 | −0.0466 | −0.0228 | −0.0342 | −0.0227 |
| | (0.0376) | (0.0247) | (0.0226) | (0.0919) | (0.0363) | (0.0372) | (0.0363) |
| IQ | −0.00213 | −0.00103 | −0.000505 | −0.00161 | −0.000272 | −0.000381 | −0.000455 |
| | (0.00257) | (0.00132) | (0.00150) | (0.00470) | (0.00110) | (0.00113) | (0.00113) |
| GPA Percentile within HS | −0.000644 | 0.00110 | 0.00151 | 0.000220 | 0.00175 | 0.00157 | 0.00189** |
| | (0.00258) | (0.00113) | (0.00103) | (0.00498) | (0.00111) | (0.00111) | (0.000955) |
| Number of Siblings | 0.00970 | 0.000945 | −0.000997 | 0.00474 | −0.00461 | −0.00391 | −0.00625 |
| | (0.0138) | (0.00678) | (0.00628) | (0.0258) | (0.00582) | (0.00571) | (0.00503) |
| Mother Education > HS | −0.0204 | 0.0400 | 0.0525 | 0.00866 | 0.0589* | 0.0576* | 0.0598* |
| | (0.0848) | (0.0407) | (0.0413) | (0.162) | (0.0338) | (0.0341) | (0.0340) |
| Self Assessed Relative Wealth (1-5) | −0.00168 | 0.0270 | 0.0344 | 0.0125 | 0.0407* | 0.0387* | 0.0334 |
| | (0.0515) | (0.0249) | (0.0214) | (0.0987) | (0.0227) | (0.0231) | (0.0234) |
| Percent of 1957 Graduates Attending College | −0.591 | −0.210 | −0.119 | −0.462 | −0.0551 | −0.195 | |
| | (0.511) | (0.223) | (0.203) | (1.331) | (0.317) | (0.317) | |
| Any College Preparatory Classes Reported | 0.0821 | 0.0750 | 0.0782 | 0.0993 | 0.0578 | 0.0888* | |
| | (0.0758) | (0.0520) | (0.0483) | (0.0848) | (0.0455) | (0.0496) | |
| HS Seniors Per Teacher | −0.00480 | −0.00511 | −0.00418 | −0.00434 | −0.00352 | 0.00214 | |
| | (0.00721) | (0.00471) | (0.00472) | (0.00616) | (0.00569) | (0.00567) | |
| Average Teacher Post-HS Schooling | 0.167 | 0.104 | 0.0990* | 0.153 | 0.122* | 0.114 | |
| | (0.114) | (0.0679) | (0.0596) | (0.155) | (0.0703) | (0.0931) | |
| Average Teacher Pay (in $1000s) | 0.00918 | 0.0183 | 0.0310 | 0.0414 | 0.0175 | −0.00262 | |
| | (0.0699) | (0.0463) | (0.0433) | (0.0749) | (0.0648) | (0.0681) | |
| Total Spending (in $1,000,000s) | 0.00447 | 0.000813 | −0.000615 | −0.00133 | −0.0130 | 0.000688 | |
| | (0.0121) | (0.00753) | (0.00716) | (0.0136) | (0.0141) | (0.0140) | |
| Size of High School Class (1957) | | | | −0.0762 | 0.140 | −0.113 | |
| | | | | (0.268) | (0.253) | (0.348) | |
| IQ x HS Size x $10^{-3}$ | −0.000719 | 0.00710 | −0.000370 | | | | |
| | (0.00178) | (0.00532) | (0.0386) | | | | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | −0.0146 | 0.0918 | | | | |
| | | (0.00964) | (0.434) | | | | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | −0.0707 | | | | |
| | | | (0.213) | | | | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | 0.0206 | | | | |
| | | | (0.0470) | | | | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | −0.208 | | | | |
| | | | (0.382) | | | | |
| Constant | −0.652 | −0.635** | −0.731** | −0.824** | −0.826** | −0.897** | −0.187 |
| | (0.513) | (0.315) | (0.284) | (0.358) | (0.329) | (0.374) | (0.215) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3553 | 3553 | 3553 | 3553 | 3553 | 3553 | 3824 |
| First Stage F-Statistic | 4.213 | 5.480 | 3.347 | 1.879 | 2.102 | 2.164 | 2.034 |

This table gives estimates of the effect of a student's number of friends attending college on a student applying to college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Instrumental Variables Estimates of the Effect of Any Friend Attending College on Number of College Applications

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Any Friends Attending College After HS Graduation | 2.627* | 1.259*** | 1.554*** | 2.614 | 1.157** | 1.143** | 1.313** |
| | (1.566) | (0.482) | (0.494) | (3.382) | (0.501) | (0.485) | (0.541) |
| Male | 0.00381 | −0.0140 | −0.0127 | −0.0568 | −0.00152 | −0.00757 | 0.0185 |
| | (0.0609) | (0.0363) | (0.0405) | (0.118) | (0.0482) | (0.0483) | (0.0506) |
| IQ | −0.00308 | 0.00146 | 0.00311 | −0.00278 | 0.000664 | 0.000569 | −0.000550 |
| | (0.00530) | (0.00242) | (0.00341) | (0.00823) | (0.00161) | (0.00163) | (0.00178) |
| GPA Percentile within HS | −0.00126 | 0.00206 | 0.00137 | −0.00110 | 0.00148 | 0.00151 | 0.00156 |
| | (0.00401) | (0.00141) | (0.00146) | (0.00659) | (0.00123) | (0.00117) | (0.00113) |
| Number of Siblings | 0.0172 | −0.00212 | 0.00231 | 0.0148 | −0.00453 | −0.00390 | −0.00347 |
| | (0.0242) | (0.00929) | (0.00992) | (0.0413) | (0.00760) | (0.00754) | (0.00782) |
| Mother Education > HS | 0.0360 | 0.123** | 0.101** | 0.0441 | 0.0928** | 0.0965** | 0.0811** |
| | (0.115) | (0.0493) | (0.0514) | (0.158) | (0.0406) | (0.0398) | (0.0412) |
| Self Assessed Relative Wealth (1-5) | 0.0368 | 0.102** | 0.0859** | 0.0344 | 0.0955*** | 0.0903*** | 0.0539* |
| | (0.0887) | (0.0409) | (0.0436) | (0.145) | (0.0316) | (0.0308) | (0.0325) |
| Percent of 1957 Graduates Attending College | −0.635 | 0.133 | 0.0153 | −0.681 | 0.193 | 0.0644 | |
| | (0.906) | (0.318) | (0.320) | (1.872) | (0.357) | (0.375) | |
| Any College Preparatory Classes Reported | 0.153 | 0.118* | 0.139* | 0.190 | 0.112 | 0.141 | |
| | (0.125) | (0.0687) | (0.0806) | (0.177) | (0.0824) | (0.0861) | |
| HS Seniors Per Teacher | −0.0140 | −0.00665 | −0.00182 | −0.00921 | 0.00269 | 0.00145 | |
| | (0.0143) | (0.00796) | (0.00993) | (0.0147) | (0.00947) | (0.00989) | |
| Average Teacher Post-HS Schooling | 0.204 | 0.159** | 0.153* | 0.221 | 0.255*** | 0.0949 | |
| | (0.155) | (0.0715) | (0.0887) | (0.160) | (0.0990) | (0.114) | |
| Average Teacher Pay (in $1000s) | 0.0830 | 0.0862 | 0.0922 | 0.132 | −0.0127 | 0.0672 | |
| | (0.109) | (0.0636) | (0.0752) | (0.127) | (0.110) | (0.108) | |
| Total Spending (in $1,000,000s) | 0.0165 | −0.00315 | 0.00307 | 0.00767 | 0.0102 | 0.0256 | |
| | (0.0270) | (0.0103) | (0.0124) | (0.0385) | (0.0239) | (0.0236) | |
| Size of High School Class (1957) | | | | −0.360 | −0.619 | −0.835 | |
| | | | | (0.437) | (0.436) | (0.537) | |
| IQ x HS Size x $10^{-3}$ | −0.00213 | −0.00364 | −0.0699 | | | | |
| | (0.00307) | (0.0114) | (0.0716) | | | | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | 0.00338 | 0.422 | | | | |
| | | (0.0192) | (0.727) | | | | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | −0.0841 | | | | |
| | | | (0.352) | | | | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | 0.00135 | | | | |
| | | | (0.0781) | | | | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | 0.0707 | | | | |
| | | | (0.637) | | | | |
| Constant | −1.301 | −1.748*** | −1.806*** | −1.620** | −1.941*** | −1.606*** | −0.220 |
| | (0.905) | (0.512) | (0.582) | (0.782) | (0.553) | (0.591) | (0.277) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3440 | 3440 | 3440 | 3440 | 3440 | 3440 | 3698 |
| First Stage F-Statistic | 2.938 | 5.919 | 4.052 | 1.706 | 2.057 | 2.152 | 2.006 |

This table gives estimates of the effect of any friend attending college on the number of college applications a student reports using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 9: Instrumental Variables Estimates of the Effect of Number of Friends Attending College on Number of College Applications

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Number of Friends Attending College After HS Graduation | 1.894* | 1.073** | 1.257*** | 1.849 | 0.745 | 0.714* | 0.802* |
| | (0.972) | (0.417) | (0.446) | (2.792) | (0.463) | (0.382) | (0.451) |
| Male | 0.0199 | −0.00112 | 0.00175 | −0.0444 | 0.00598 | 0.00438 | 0.0299 |
| | (0.0599) | (0.0383) | (0.0422) | (0.113) | (0.0477) | (0.0450) | (0.0467) |
| IQ | −0.00180 | 0.00162 | 0.00406 | −0.00140 | 0.00122 | 0.00126 | 0.000229 |
| | (0.00417) | (0.00240) | (0.00338) | (0.00750) | (0.00162) | (0.00151) | (0.00169) |
| GPA Percentile within HS | −0.00157 | 0.00134 | 0.000736 | −0.000838 | 0.00182 | 0.00190 | 0.00193 |
| | (0.00363) | (0.00167) | (0.00176) | (0.00722) | (0.00138) | (0.00116) | (0.00119) |
| Number of Siblings | 0.0144 | −0.000459 | 0.00306 | 0.00981 | −0.00798 | −0.00810 | −0.00898 |
| | (0.0208) | (0.0101) | (0.0109) | (0.0407) | (0.00778) | (0.00679) | (0.00677) |
| Mother Education > HS | −0.0161 | 0.0781 | 0.0533 | 0.00654 | 0.0790* | 0.0861** | 0.0689 |
| | (0.118) | (0.0614) | (0.0667) | (0.233) | (0.0470) | (0.0424) | (0.0462) |
| Self Assessed Relative Wealth (1-5) | 0.0412 | 0.0943** | 0.0817* | 0.0452 | 0.104*** | 0.101*** | 0.0653** |
| | (0.0779) | (0.0424) | (0.0453) | (0.153) | (0.0333) | (0.0300) | (0.0329) |
| Percent of 1957 Graduates Attending College | −0.583 | 0.0292 | −0.0593 | −0.569 | 0.306 | 0.228 | |
| | (0.769) | (0.355) | (0.366) | (2.012) | (0.418) | (0.375) | |
| Any College Preparatory Classes Reported | 0.132 | 0.112 | 0.137 | 0.163 | 0.0924 | 0.122 | |
| | (0.113) | (0.0741) | (0.0858) | (0.150) | (0.0753) | (0.0782) | |
| HS Seniors Per Teacher | −0.00785 | −0.00396 | 0.00232 | −0.00576 | 0.00349 | 0.00525 | |
| | (0.0120) | (0.00799) | (0.00989) | (0.0116) | (0.00879) | (0.00874) | |
| Average Teacher Post-HS Schooling | 0.270* | 0.211*** | 0.216** | 0.281 | 0.267*** | 0.164 | |
| | (0.155) | (0.0790) | (0.0941) | (0.246) | (0.0988) | (0.121) | |
| Average Teacher Pay (in $1000s) | 0.0554 | 0.0690 | 0.0908 | 0.118 | −0.000852 | 0.0426 | |
| | (0.105) | (0.0694) | (0.0821) | (0.113) | (0.102) | (0.0991) | |
| Total Spending (in $1,000,000s) | 0.00698 | −0.00556 | −0.00299 | −0.00193 | 0.000494 | 0.0143 | |
| | (0.0202) | (0.0108) | (0.0127) | (0.0282) | (0.0216) | (0.0208) | |
| Size of High School Class (1957) | | | | −0.327 | −0.479 | −0.780 | |
| | | | | (0.415) | (0.408) | (0.506) | |
| IQ x HS Size x $10^{-3}$ | −0.00264 | −0.00606 | −0.101 | | | | |
| | (0.00284) | (0.0108) | (0.0752) | | | | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | 0.00743 | 0.829 | | | | |
| | | (0.0187) | (0.762) | | | | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | −0.322 | | | | |
| | | | (0.362) | | | | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | 0.0620 | | | | |
| | | | (0.0789) | | | | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | −0.476 | | | | |
| | | | (0.637) | | | | |
| Constant | −1.464* | −1.812*** | −1.997*** | −1.831*** | −1.983*** | −1.833*** | −0.347 |
| | (0.810) | (0.535) | (0.601) | (0.622) | (0.523) | (0.557) | (0.288) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3440 | 3440 | 3440 | 3440 | 3440 | 3440 | 3698 |
| First Stage F-Statistic | 3.784 | 5.243 | 3.472 | 1.797 | 2.046 | 2.087 | 2.014 |

This table gives estimates of the effect of a student's number of friends attending college on the number of college applications a student reports using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 10: Instrumental Variables Estimates of the Effect of Any Friend Attending College on Attending College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Any Friends Attending College After HS Graduation | 1.474** | 0.786*** | 0.922*** | 0.577 | 0.482** | 0.645** | 0.568** |
| | (0.728) | (0.255) | (0.256) | (0.441) | (0.242) | (0.269) | (0.278) |
| Male | 0.0533** | 0.0445*** | 0.0456*** | 0.0745*** | 0.0789*** | 0.0707*** | 0.0809*** |
| | (0.0247) | (0.0145) | (0.0160) | (0.0239) | (0.0238) | (0.0262) | (0.0260) |
| IQ | −0.00106 | 0.000781 | 0.000212 | 0.00134 | 0.00156* | 0.00126 | 0.00158* |
| | (0.00255) | (0.00114) | (0.00130) | (0.00133) | (0.000857) | (0.000955) | (0.000941) |
| GPA Percentile within HS | 0.00148 | 0.00313*** | 0.00280*** | 0.00302*** | 0.00318*** | 0.00277*** | 0.00308*** |
| | (0.00192) | (0.000748) | (0.000771) | (0.000925) | (0.000599) | (0.000655) | (0.000578) |
| Number of Siblings | 0.00332 | −0.00606 | −0.00421 | −0.00546 | −0.00723* | −0.00577 | −0.00673 |
| | (0.0115) | (0.00526) | (0.00538) | (0.00585) | (0.00399) | (0.00433) | (0.00415) |
| Mother Education > HS | 0.0865 | 0.136*** | 0.126*** | 0.128*** | 0.126*** | 0.122*** | 0.126*** |
| | (0.0599) | (0.0258) | (0.0274) | (0.0282) | (0.0202) | (0.0218) | (0.0217) |
| Self Assessed Relative Wealth (1-5) | 0.00462 | 0.0337* | 0.0277 | 0.0387* | 0.0384** | 0.0321* | 0.0340** |
| | (0.0386) | (0.0184) | (0.0201) | (0.0215) | (0.0153) | (0.0167) | (0.0166) |
| Percent of 1957 Graduates Attending College | −0.356 | 0.0374 | −0.0324 | 0.131 | 0.179 | 0.0821 | |
| | (0.395) | (0.146) | (0.142) | (0.244) | (0.164) | (0.193) | |
| Any College Preparatory Classes Reported | −0.00407 | −0.00454 | −0.00366 | −0.0109 | −0.0114 | −0.00619 | |
| | (0.0509) | (0.0312) | (0.0345) | (0.0426) | (0.0420) | (0.0452) | |
| HS Seniors Per Teacher | −0.00492 | −0.00428 | −0.00458 | −0.00335 | −0.00307 | −0.00246 | |
| | (0.00533) | (0.00297) | (0.00352) | (0.00368) | (0.00517) | (0.00547) | |
| Average Teacher Post-HS Schooling | 0.0906 | 0.0429 | 0.0494 | 0.0749* | 0.0423 | 0.0363 | |
| | (0.0758) | (0.0389) | (0.0436) | (0.0419) | (0.0583) | (0.0708) | |
| Average Teacher Pay (in $1000s) | −0.0597 | −0.0612** | −0.0572* | −0.0496 | −0.106* | −0.0769 | |
| | (0.0515) | (0.0296) | (0.0344) | (0.0367) | (0.0545) | (0.0599) | |
| Total Spending (in $1,000,000s) | 0.00982 | 0.00626 | 0.00729 | 0.00283 | 0.0119 | 0.00765 | |
| | (0.00918) | (0.00404) | (0.00488) | (0.00922) | (0.0129) | (0.0133) | |
| Size of High School Class (1957) | | | | −0.00824 | 0.327 | 0.459* | |
| | | | | (0.104) | (0.207) | (0.268) | |
| IQ x HS Size x $10^{-3}$ | 0.000302 | 0.00656** | 0.00929 | | | | |
| | (0.00134) | (0.00328) | (0.0270) | | | | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | −0.0121* | −0.0354 | | | | |
| | | (0.00648) | (0.314) | | | | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | 0.00508 | | | | |
| | | | (0.156) | | | | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | 0.000700 | | | | |
| | | | (0.0346) | | | | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | −0.0215 | | | | |
| | | | (0.281) | | | | |
| Constant | −0.212 | −0.235 | −0.216 | −0.495** | −0.139 | −0.202 | 0.512*** |
| | (0.361) | (0.183) | (0.210) | (0.195) | (0.295) | (0.335) | (0.143) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3798 | 3798 | 3798 | 3798 | 3798 | 3798 | 4103 |
| First Stage F-Statistic | 3.822 | 7.015 | 4.301 | 1.813 | 2.179 | 2.252 | 2.031 |

This table gives estimates of the effect of a student's number of friends attending college on a student attending college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 11: Instrumental Variables Estimates of the Effect of Number of Friends Attending College on Attending College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars | | | |
|---|---|---|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Number of Friends Attending College After HS Graduation | 1.045** | 0.654*** | 0.732*** | 0.406 | 0.384** | 0.480** | 0.364* |
| | (0.433) | (0.211) | (0.198) | (0.289) | (0.182) | (0.202) | (0.195) |
| Male | 0.0574** | 0.0490*** | 0.0505*** | 0.0735*** | 0.0752*** | 0.0689*** | 0.0830*** |
| | (0.0245) | (0.0166) | (0.0178) | (0.0236) | (0.0244) | (0.0263) | (0.0250) |
| IQ | −0.0000915 | 0.00108 | 0.000951 | 0.00172* | 0.00170** | 0.00156* | 0.00194** |
| | (0.00184) | (0.00109) | (0.00126) | (0.00103) | (0.000803) | (0.000866) | (0.000830) |
| GPA Percentile within HS | 0.00136 | 0.00273*** | 0.00248*** | 0.00308*** | 0.00312*** | 0.00279*** | 0.00322*** |
| | (0.00168) | (0.000870) | (0.000840) | (0.000832) | (0.000602) | (0.000650) | (0.000545) |
| Number of Siblings | 0.00240 | −0.00476 | −0.00338 | −0.00630 | −0.00747* | −0.00670* | −0.00865** |
| | (0.00981) | (0.00568) | (0.00556) | (0.00502) | (0.00382) | (0.00404) | (0.00355) |
| Mother Education > HS | 0.0586 | 0.108*** | 0.0984*** | 0.120*** | 0.115*** | 0.112*** | 0.120*** |
| | (0.0613) | (0.0336) | (0.0340) | (0.0313) | (0.0228) | (0.0241) | (0.0237) |
| Self Assessed Relative Wealth (1-5) | 0.0100 | 0.0315 | 0.0280 | 0.0418** | 0.0393*** | 0.0350** | 0.0384** |
| | (0.0321) | (0.0196) | (0.0201) | (0.0189) | (0.0149) | (0.0160) | (0.0154) |
| Percent of 1957 Graduates Attending College | −0.327 | −0.0244 | −0.0779 | 0.150 | 0.162 | 0.0989 | |
| | (0.327) | (0.166) | (0.153) | (0.214) | (0.166) | (0.189) | |
| Any College Preparatory Classes Reported | −0.00790 | −0.00677 | −0.00278 | −0.0141 | −0.0162 | −0.00928 | |
| | (0.0475) | (0.0336) | (0.0364) | (0.0404) | (0.0416) | (0.0435) | |
| HS Seniors Per Teacher | −0.00252 | −0.00277 | −0.00258 | −0.00302 | −0.00251 | −0.00129 | |
| | (0.00510) | (0.00335) | (0.00413) | (0.00356) | (0.00522) | (0.00538) | |
| Average Teacher Post-HS Schooling | 0.130* | 0.0790* | 0.0919* | 0.0877* | 0.0530 | 0.0794 | |
| | (0.0772) | (0.0449) | (0.0479) | (0.0454) | (0.0594) | (0.0748) | |
| Average Teacher Pay (in $1000s) | −0.0775 | −0.0724** | −0.0602* | −0.0544 | −0.105* | −0.0989* | |
| | (0.0482) | (0.0321) | (0.0357) | (0.0346) | (0.0540) | (0.0574) | |
| Total Spending (in $1,000,000s) | 0.00720 | 0.00525 | 0.00453 | 0.00193 | 0.00905 | 0.00478 | |
| | (0.00756) | (0.00435) | (0.00468) | (0.00877) | (0.0129) | (0.0128) | |
| Size of High School Class (1957) | | | | 0.000845 | 0.353* | 0.477* | |
| | | | | (0.101) | (0.202) | (0.265) | |
| IQ x HS Size x $10^{-3}$ | −0.000123 | 0.00433 | −0.00897 | | | | |
| | (0.00130) | (0.00357) | (0.0299) | | | | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | −0.00833 | 0.209 | | | | |
| | | (0.00703) | (0.342) | | | | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | −0.140 | | | | |
| | | | (0.169) | | | | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | 0.0376 | | | | |
| | | | (0.0373) | | | | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | −0.353 | | | | |
| | | | (0.302) | | | | |
| Constant | −0.316 | −0.309 | −0.357 | −0.532*** | −0.159 | −0.280 | 0.458*** |
| | (0.323) | (0.200) | (0.229) | (0.191) | (0.295) | (0.334) | (0.126) |
| Extracurricular Membership Controls | *No* | *No* | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *No* | *No* | *No* | *Yes* |
| Observations | 3798 | 3798 | 3798 | 3798 | 3798 | 3798 | 4103 |
| First Stage F-Statistic | 5.445 | 6.674 | 3.911 | 1.852 | 2.037 | 2.075 | 1.947 |

This table gives estimates of the effect of a student's number of friends attending college on a student attending college using several instrumental variables. The first three columns use a function of HS size as an instrument, with the specific function given in the subheader. The first two columns estimate parameters by two-stage least squares, while the third column use limited information maximum likelihood. Standard errors are clustered at the high school level for these three specifications. The remaining four columns use as an instrument the size of extracurriculars participated in by each student. Each of these four columns has different controls as indicated in the subheading. Parameters in the final four columns are estimated via limited information maximum likelihood. All regressions control for HS town size and distance to college. Two-stage least squares regressions cluster standard errors at the high school level. Robust standard errors given for limited information maximum likelihood regressions.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table 1: Strongest Extracurricular Instruments

| | Dependant Variable: Any College Applications | | | | Dependant Variable: Attending College | | | |
|---|---|---|---|---|---|---|---|---|
| | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Any Friends Attending College After HS Graduation | 0.198 | 0.199* | 0.219* | 0.226* | 0.106 | 0.152 | 0.152 | 0.187 |
| | (0.132) | (0.112) | (0.116) | (0.119) | (0.156) | (0.143) | (0.154) | (0.163) |
| Male | 0.00473 | 0.00494 | −0.00209 | 0.00213 | 0.0908*** | 0.0933*** | 0.0937*** | 0.0983*** |
| | (0.0213) | (0.0220) | (0.0224) | (0.0228) | (0.0208) | (0.0217) | (0.0221) | (0.0225) |
| IQ | 0.000936 | 0.000743 | 0.000663 | 0.000414 | 0.00261*** | 0.00241*** | 0.00250*** | 0.00254*** |
| | (0.000665) | (0.000635) | (0.000631) | (0.000628) | (0.000724) | (0.000686) | (0.000700) | (0.000703) |
| GPA Percentile within HS | 0.00297*** | 0.00287*** | 0.00285*** | 0.00292*** | 0.00389*** | 0.00373*** | 0.00363*** | 0.00365*** |
| | (0.000426) | (0.000412) | (0.000412) | (0.000389) | (0.000452) | (0.000443) | (0.000455) | (0.000423) |
| Number of Siblings | −0.00889*** | −0.00924*** | −0.00880*** | −0.00982*** | −0.0112*** | −0.0110*** | −0.0111*** | −0.0111*** |
| | (0.00315) | (0.00301) | (0.00306) | (0.00296) | (0.00333) | (0.00323) | (0.00329) | (0.00322) |
| Mother Education > HS | 0.102*** | 0.0903*** | 0.0946*** | 0.0919*** | 0.149*** | 0.138*** | 0.139*** | 0.140*** |
| | (0.0186) | (0.0182) | (0.0182) | (0.0178) | (0.0185) | (0.0179) | (0.0181) | (0.0180) |
| Self-Assessed Relative Wealth (1-5) | 0.0652*** | 0.0602*** | 0.0585*** | 0.0526*** | 0.0543*** | 0.0473*** | 0.0455*** | 0.0449*** |
| | (0.0132) | (0.0126) | (0.0126) | (0.0125) | (0.0134) | (0.0130) | (0.0131) | (0.0132) |
| Percent of 1957 Graduates Attending College | 0.300*** | 0.312*** | 0.209* | | 0.389*** | 0.366*** | 0.381*** | |
| | (0.0905) | (0.103) | (0.111) | | (0.103) | (0.116) | (0.130) | |
| Any College Preparatory Classes Reported | 0.0747** | 0.0589 | 0.0818** | | −0.0147 | −0.00525 | −0.00978 | |
| | (0.0357) | (0.0369) | (0.0375) | | (0.0365) | (0.0378) | (0.0378) | |
| HS Seniors Per Teacher | −0.00200 | −0.00633 | 0.0000551 | | −0.00281 | −0.00665 | −0.00433 | |
| | (0.00325) | (0.00459) | (0.00452) | | (0.00332) | (0.00484) | (0.00470) | |
| Average Teacher Post-HS Schooling | 0.0963*** | 0.0504 | 0.0257 | | 0.0821** | 0.0152 | 0.0409 | |
| | (0.0365) | (0.0535) | (0.0594) | | (0.0369) | (0.0544) | (0.0594) | |
| Average Teacher Pay (in $1000s) | −0.00278 | −0.00241 | 0.0284 | | −0.0856*** | −0.134*** | −0.0917* | |
| | (0.0334) | (0.0508) | (0.0522) | | (0.0327) | (0.0512) | (0.0512) | |
| Total Spending (in $1,000,000s) | −0.00421 | −0.00221 | −0.00414 | | 0.000764 | 0.0123 | −0.00125 | |
| | (0.00872) | (0.0116) | (0.0114) | | (0.00908) | (0.0123) | (0.0119) | |
| Size of High School Class (1957) | 0.150 | 0.413** | 0.192 | | 0.0198 | 0.587*** | 0.713*** | |
| | (0.101) | (0.194) | (0.239) | | (0.0958) | (0.190) | (0.229) | |
| Constant | −0.994*** | −0.580** | −0.791*** | −0.404*** | −0.569*** | 0.0884 | −0.197 | 0.351*** |
| | (0.189) | (0.267) | (0.287) | (0.0803) | (0.187) | (0.275) | (0.290) | (0.0948) |
| Extracurricular Membership Controls | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Extracurricular Exists at HS Controls | *No* | *Yes* | *No* | *No* | *No* | *Yes* | *No* | *No* |
| Extracurricular Size at HS Controls | *No* | *No* | *Yes* | *No* | *No* | *No* | *Yes* | *No* |
| HS Fixed Effects | *No* | *No* | *No* | *Yes* | *No* | *No* | *No* | *Yes* |
| Observations | 3553 | 3553 | 3553 | 3824 | 3798 | 3798 | 3798 | 4103 |
| First Stage F-Statistic | 6.330 | 7.205 | 6.891 | 6.282 | 6.541 | 7.454 | 6.864 | 5.981 |

This table repeats the results from the last four columns of Tables (6) and (10) but with the eleven strongest extracurricular instruments. These extra curriculars are: Baseball, Football, Wrestling, Sports Manager/Assistant Twirling, Chorus/Choir, Pep Band/Marching Band French, History, Future Homemakers of America, and Diversity Clubs. See notes for tables (6) and (10) for more details.

* p < 0.10, ** p < 0.05, *** p < 0.01

Appendix Table 2a: Special Regressor Method Estimates of the Effect of Any Friend Attending College on Considering College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Any Friends Attending College After HS Graduation | −0.391*** | −0.172** | −0.0765** | 0.0238 |
| | (0.0722) | (0.0736) | (0.0369) | (0.0509) |
| Male | 0.00198 | −0.000764 | −0.000790 | −0.0285 |
| | (0.00823) | (0.00680) | (0.00244) | (0.0177) |
| IQ | 0.00365*** | 0.00269*** | 0.0112*** | 0.0129*** |
| | (0.000502) | (0.000501) | (0.00183) | (0.00130) |
| GPA Percentile within HS | 0.001000*** | 0.000482* | 0.000152 | −0.00202*** |
| | (0.000241) | (0.000264) | (0.000120) | (0.000452) |
| Number of Siblings | −0.00586*** | −0.00248 | −0.00133** | 0.00155 |
| | (0.00209) | (0.00157) | (0.000650) | (0.00314) |
| Mother Education > HS | 0.0284** | 0.0121 | 0.00605** | −0.0136 |
| | (0.0131) | (0.0101) | (0.00302) | (0.0204) |
| Self-Assessed Relative Wealth (1-5) | 0.0169* | 0.00852 | 0.00442* | 0.00365 |
| | (0.00904) | (0.00644) | (0.00253) | (0.0173) |
| Percent of 1957 Graduates Attending College | 0.222*** | 0.0960** | 0.0425* | −0.0245 |
| | (0.0509) | (0.0472) | (0.0224) | (0.0608) |
| Any College Preparatory Classes Reported | 0.0216 | 0.00695 | 0.00593 | −0.0264 |
| | (0.0208) | (0.0151) | (0.00638) | (0.0382) |
| HS Seniors Per Teacher | 0.00271 | 0.00114 | 0.00139** | 0.000618 |
| | (0.00204) | (0.00123) | (0.000676) | (0.00448) |
| Average Teacher Post-HS Schooling | −0.000380 | 0.00184 | 0.00235 | −0.0122 |
| | (0.0191) | (0.0152) | (0.00617) | (0.0326) |
| Average Teacher Pay (in $1000s) | 0.00109 | 0.00218 | −0.0000250 | −0.0192 |
| | (0.0157) | (0.00939) | (0.00392) | (0.0262) |
| Total Spending (in $1,000,000s) | −0.00130 | −0.000635 | −0.000282 | 0.00219 |
| | (0.00211) | (0.00133) | (0.000468) | (0.00322) |
| Size of High School Class (1957) | | | | 0.0612 |
| | | | | (0.0836) |
| IQ x HS Size x $10^{-3}$ | −0.0000946 | −0.000449 | −0.00797 | |
| | (0.000508) | (0.00138) | (0.00718) | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | 0.000839 | 0.0924 | |
| | | (0.00269) | (0.0746) | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | −0.0468 | |
| | | | (0.0342) | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | 0.0105 | |
| | | | (0.00717) | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | −0.0844 | |
| | | | (0.0558) | |
| Constant | −0.0330 | −0.0288 | −0.00555 | 0.370** |
| | (0.0882) | (0.0670) | (0.0297) | (0.171) |
| Observations | 3627 | 3627 | 3627 | 3627 |

This table repeats the regressions in Table (4) using Lewbel's (2000) special regressor method for a binary dependant variable and binary endogenous regressor. The special regressor used is IQ. Marginal effects are reported with bootstrapped standard errors. Town size, distance to college, and extracurricular participation controls are omitted to speed up computation. See Table (4) notes for more details.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table 2b: IV Probit Estimates of the Effect of Number of Friends Attending College on Considering College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Number of Friends Attending College After HS Graduation | −0.532 | 0.815 | 1.061** | 1.158 |
| | (1.062) | (0.922) | (0.504) | (0.818) |
| Male | 0.149* | 0.177*** | 0.167*** | 0.184 |
| | (0.0867) | (0.0569) | (0.0562) | (0.152) |
| IQ | 0.0189*** | 0.0137* | 0.0111** | 0.0113 |
| | (0.00293) | (0.00738) | (0.00477) | (0.00872) |
| GPA Percentile within HS | 0.0126*** | 0.00837 | 0.00657 | 0.00606 |
| | (0.00110) | (0.00608) | (0.00434) | (0.00641) |
| Number of Siblings | −0.0307** | −0.00745 | −0.000978 | 0.00308 |
| | (0.0152) | (0.0242) | (0.0165) | (0.0194) |
| Mother Education > HS | 0.264*** | 0.112 | 0.0640 | 0.0341 |
| | (0.0849) | (0.176) | (0.126) | (0.136) |
| Self-Assessed Relative Wealth (1-5) | 0.160*** | 0.0945 | 0.0726 | 0.0675 |
| | (0.0432) | (0.0916) | (0.0709) | (0.0972) |
| Percent of 1957 Graduates Attending College | 1.230** | 0.247 | −0.0142 | −0.194 |
| | (0.552) | (0.935) | (0.579) | (0.894) |
| Any College Preparatory Classes Reported | −0.117 | −0.235** | −0.228** | −0.269** |
| | (0.157) | (0.107) | (0.113) | (0.124) |
| HS Seniors Per Teacher | −0.00349 | −0.0155 | −0.0147 | −0.0147 |
| | (0.0119) | (0.0102) | (0.0119) | (0.0110) |
| Average Teacher Post-HS Schooling | 0.00850 | 0.0306 | 0.0735 | 0.178 |
| | (0.126) | (0.133) | (0.116) | (0.113) |
| Average Teacher Pay (in $1000s) | −0.0473 | −0.0742 | −0.0683 | −0.0600 |
| | (0.0724) | (0.0801) | (0.0730) | (0.0822) |
| Total Spending (in $1,000,000s) | 0.0124 | 0.0175 | 0.0154 | 0.00539 |
| | (0.0113) | (0.0130) | (0.0117) | (0.0114) |
| Size of High School Class (1957) | | | | 0.408 |
| | | | | (0.384) |
| IQ x HS Size x $10^{-3}$ | 0.00226 | 0.0200 | 0.0407 | |
| | (0.00272) | (0.0129) | (0.0973) | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | −0.0360 | −0.349 | |
| | | (0.0234) | (1.051) | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | 0.149 | |
| | | | (0.513) | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | −0.0273 | |
| | | | (0.114) | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | 0.164 | |
| | | | (0.933) | |
| | | | | (0.123) |
| Constant | −2.174*** | −1.399* | −1.345** | −1.847** |
| | (0.615) | (0.764) | (0.663) | (0.937) |
| Observations | 3815 | 3815 | 3815 | 3779 |

This table repeats the regressions in Table (5) using an IV Probit model (maximum likelihood structural equations) which is suitable for a binary dependant variable and continuous endogenous regressor. Robust standard errors are in parentheses. See Table (5) notes for more details.
* p < 0.10, ** p < 0.05, *** p < 0.01

Appendix Table 2c: Special Regressor Method Estimates of the Effect of Any Friend Attending College on Applying to College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Any Friends Attending College After HS Graduation | $-0.302^{***}$ | $-0.116$ | $-0.105^{***}$ | $0.162^{***}$ |
| | (0.110) | (0.0926) | (0.0286) | (0.0449) |
| Male | $-0.0112$ | $-0.00360$ | $-0.00530^{*}$ | $-0.0943^{***}$ |
| | (0.00891) | (0.00490) | (0.00290) | (0.0215) |
| IQ | $0.00285^{***}$ | $0.00184^{***}$ | $0.0114^{***}$ | $0.0131^{***}$ |
| | (0.000426) | (0.000479) | (0.00209) | (0.00145) |
| GPA Percentile within HS | $0.000875^{**}$ | 0.000333 | $0.000324^{***}$ | $-0.00237^{***}$ |
| | (0.000430) | (0.000322) | (0.0000942) | (0.000340) |
| Number of Siblings | $-0.00522^{*}$ | $-0.00202$ | $-0.00195^{***}$ | $-0.00495$ |
| | (0.00270) | (0.00155) | (0.000638) | (0.00438) |
| Mother Education > HS | $0.0278^{**}$ | 0.0111 | $0.0101^{***}$ | 0.0278 |
| | (0.0115) | (0.00990) | (0.00367) | (0.0247) |
| Self-Assessed Relative Wealth (1-5) | $0.0189^{*}$ | 0.00761 | $0.00842^{***}$ | $0.0310^{*}$ |
| | (0.0101) | (0.00579) | (0.00224) | (0.0163) |
| Percent of 1957 Graduates Attending College | $0.197^{***}$ | 0.0729 | $0.0719^{***}$ | $-0.0421$ |
| | (0.0712) | (0.0607) | (0.0160) | (0.0596) |
| Any College Preparatory Classes Reported | 0.00856 | 0.00384 | 0.00663 | 0.0401 |
| | (0.0213) | (0.0153) | (0.00841) | (0.0389) |
| HS Seniors Per Teacher | 0.00183 | 0.000668 | 0.000519 | 0.000286 |
| | (0.00252) | (0.00130) | (0.000633) | (0.00363) |
| Average Teacher Post-HS Schooling | 0.00704 | 0.00294 | 0.00638 | 0.0403 |
| | (0.0216) | (0.0120) | (0.00545) | (0.0397) |
| Average Teacher Pay (in $1000s) | 0.00185 | 0.000524 | 0.00195 | $-0.0207$ |
| | (0.0138) | (0.00963) | (0.00386) | (0.0286) |
| Total Spending (in $1,000,000s) | $-0.00241$ | $-0.000867$ | $-0.00150^{***}$ | $-0.00741^{*}$ |
| | (0.00221) | (0.00110) | (0.000579) | (0.00390) |
| Size of High School Class (1957) | | | | $-0.0235$ |
| | | | | (0.106) |
| IQ x HS Size x $10^{-3}$ | $-0.000230$ | $-0.0000839$ | $-0.0109$ | |
| | (0.000521) | (0.00103) | (0.00835) | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | 0.00000897 | 0.128 | |
| | | (0.00193) | (0.0900) | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | $-0.0636$ | |
| | | | (0.0427) | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | 0.0137 | |
| | | | (0.00914) | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | $-0.107$ | |
| | | | (0.0723) | |
| Constant | $-0.0963$ | $-0.0375$ | $-0.0374$ | $-0.163$ |
| | (0.116) | (0.0598) | (0.0262) | (0.203) |
| Observations | 3379 | 3379 | 3379 | 3379 |

This table repeats the regressions in Table (6) using Lewbel's (2000) special regressor method for a binary dependant variable and binary endogenous regressor. The special regressor used is IQ. Marginal effects are reported with bootstrapped standard errors. Town size, distance to college, and extracurricular participation controls are omitted to speed up computation. See Table (6) notes for more details.
* p < 0.10, ** p < 0.05, *** p < 0.01

Appendix Table 2d: IV Probit Estimates of the Effect of Number of Friends Attending College on Applying College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Number of Friends Attending College After HS Graduation | 1.670*** | 1.634*** | 1.578*** | 1.538 |
| | (0.0426) | (0.0761) | (0.142) | (2.415) |
| Male | −0.0302 | −0.0531 | −0.0740 | −0.0922 |
| | (0.0521) | (0.0526) | (0.0600) | (0.0709) |
| IQ | −0.00252 | −0.00149 | 0.000527 | −0.000734 |
| | (0.00241) | (0.00227) | (0.00269) | (0.0171) |
| GPA Percentile within HS | −0.00155 | 0.000247 | 0.00191 | 0.00328 |
| | (0.00294) | (0.00282) | (0.00359) | (0.0370) |
| Number of Siblings | 0.0119 | 0.00480 | −0.00195 | −0.00719 |
| | (0.0133) | (0.0131) | (0.0163) | (0.151) |
| Mother Education > HS | −0.0598 | −0.00522 | 0.0443 | 0.0813 |
| | (0.0970) | (0.0950) | (0.119) | (1.087) |
| Self-Assessed Relative Wealth (1-5) | −0.0102 | 0.0231 | 0.0519 | 0.0878 |
| | (0.0599) | (0.0575) | (0.0702) | (0.761) |
| Percent of 1957 Graduates Attending College | −0.818*** | −0.624* | −0.413 | −0.277 |
| | (0.309) | (0.320) | (0.417) | (5.062) |
| Any College Preparatory Classes Reported | 0.0357 | 0.0712 | 0.123 | 0.155 |
| | (0.106) | (0.106) | (0.116) | (0.783) |
| HS Seniors Per Teacher | −0.0105 | −0.0120 | −0.0103 | −0.0138 |
| | (0.00725) | (0.00825) | (0.0103) | (0.0392) |
| Average Teacher Post-HS Schooling | 0.131 | 0.147 | 0.162* | 0.181 |
| | (0.0880) | (0.0894) | (0.0940) | (0.250) |
| Average Teacher Pay (in $1000s) | 0.0403 | 0.0461 | 0.0411 | 0.138 |
| | (0.0571) | (0.0580) | (0.0635) | (0.430) |
| Total Spending (in $1,000,000s) | −0.0104 | −0.0144 | −0.0174* | −0.0219 |
| | (0.0105) | (0.00952) | (0.0105) | (0.0988) |
| Size of High School Class (1957) | | | | −0.327 |
| | | | | (0.320) |
| IQ x HS Size x $10^{-3}$ | −0.00297 | −0.00179 | −0.0321 | |
| | (0.00194) | (0.00851) | (0.0714) | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | −0.00272 | 0.284 | |
| | | (0.0168) | (0.798) | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | −0.117 | |
| | | | (0.399) | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | 0.0227 | |
| | | | (0.0898) | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | −0.174 | |
| | | | (0.738) | |
| Constant | −1.029 | −1.525* | −2.023** | −2.766 |
| | (0.988) | (0.825) | (0.941) | (11.37) |
| Observations | 3553 | 3553 | 3553 | 3542 |

This table repeats the regressions in Table (7) using an IV Probit model (maximum likelihood structural equations) which is suitable for a binary dependant variable and continuous endogenous regressor. Robust standard errors are in parentheses. See Table (7) notes for more details.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table 2e: Special Regressor Method Estimates of the Effect of Any Friend Attending College on Attending College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Any Friends Attending College After HS Graduation | 2.154*** | 2.020*** | 2.079*** | 1.240 |
| | (0.0979) | (0.197) | (0.124) | (1.284) |
| Male | 0.0703 | 0.0898** | 0.0828* | 0.241** |
| | (0.0449) | (0.0445) | (0.0424) | (0.122) |
| IQ | −0.00173 | 0.000799 | 0.00127 | 0.00606 |
| | (0.00346) | (0.00340) | (0.00307) | (0.00640) |
| GPA Percentile within HS | 0.00109 | 0.00431 | 0.00318 | 0.0104 |
| | (0.00372) | (0.00355) | (0.00280) | (0.00645) |
| Number of Siblings | 0.00749 | −0.00424 | −0.000173 | −0.0248 |
| | (0.0149) | (0.0151) | (0.0125) | (0.0285) |
| Mother Education > HS | 0.0897 | 0.208 | 0.165 | 0.427** |
| | (0.139) | (0.134) | (0.109) | (0.215) |
| Self-Assessed Relative Wealth (1-5) | 0.00244 | 0.0492 | 0.0305 | 0.156 |
| | (0.0618) | (0.0602) | (0.0509) | (0.115) |
| Percent of 1957 Graduates Attending College | −0.590 | −0.229 | −0.332 | 0.735 |
| | (0.395) | (0.421) | (0.315) | (1.149) |
| Any College Preparatory Classes Reported | −0.0674 | −0.0697 | −0.0441 | −0.0524 |
| | (0.0866) | (0.0957) | (0.0977) | (0.116) |
| HS Seniors Per Teacher | −0.0124 | −0.0145* | −0.00993 | −0.0188* |
| | (0.00775) | (0.00875) | (0.00911) | (0.0108) |
| Average Teacher Post-HS Schooling | 0.0594 | 0.0583 | 0.0639 | 0.131 |
| | (0.0801) | (0.0882) | (0.0873) | (0.110) |
| Average Teacher Pay (in $1000s) | −0.0398 | −0.0686 | −0.0777 | −0.0287 |
| | (0.0573) | (0.0641) | (0.0605) | (0.0817) |
| Total Spending (in $1,000,000s) | 0.00218 | 0.00195 | 0.00289 | −0.0122 |
| | (0.00735) | (0.00811) | (0.00798) | (0.0115) |
| Size of High School Class (1957) | | | | 0.0222 |
| | | | | (0.295) |
| IQ x HS Size x $10^{-3}$ | −0.000374 | 0.00489 | −0.0298 | |
| | (0.00177) | (0.00843) | (0.0666) | |
| IQ x $(\text{HS Size})^2$ x $10^{-6}$ | | −0.0100 | 0.193 | |
| | | (0.0159) | (0.771) | |
| IQ x $(\text{HS Size})^3$ x $10^{-8}$ | | | −0.0290 | |
| | | | (0.389) | |
| IQ x $(\text{HS Size})^4$ x $10^{-10}$ | | | −0.00388 | |
| | | | (0.0875) | |
| IQ x $(\text{HS Size})^5$ x $10^{-14}$ | | | 0.0821 | |
| | | | (0.718) | |
| Constant | −0.694 | −1.242 | −1.106* | −3.118** |
| | (0.872) | (0.790) | (0.671) | (1.324) |
| Observations | 3798 | 3798 | 3798 | 3792 |

This table repeats the regressions in Table (10) using Lewbel's (2000) special regressor method for a binary dependant variable and binary endogenous regressor. The special regressor used is IQ. Marginal effects are reported with bootstrapped standard errors. Town size, distance to college, and extracurricular participation controls are omitted to speed up computation. See Table (10) notes for more details.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table 2f: IV Probit Estimates of the Effect of Number of Friends Attending College on Attending College

| | Instrument: Function of HS Size | | | Instrument: Size of Student's Extracurriculars |
|---|---|---|---|---|
| | HS Size | Quadratic in HS Size | Quintic in HS Size | Basic |
| Number of Friends Attending College After HS Graduation | 1.650*** | 1.580*** | 1.615*** | 0.967 |
| | (0.0816) | (0.126) | (0.0804) | (0.943) |
| Male | 0.0790* | 0.0934** | 0.0881** | 0.233* |
| | (0.0440) | (0.0432) | (0.0411) | (0.124) |
| IQ | −0.000474 | 0.00151 | 0.00307 | 0.00655 |
| | (0.00335) | (0.00310) | (0.00285) | (0.00557) |
| GPA Percentile within HS | 0.000799 | 0.00311 | 0.00216 | 0.0102 |
| | (0.00362) | (0.00336) | (0.00260) | (0.00632) |
| Number of Siblings | 0.00750 | −0.000786 | 0.00258 | −0.0249 |
| | (0.0145) | (0.0141) | (0.0117) | (0.0268) |
| Mother Education > HS | 0.0469 | 0.133 | 0.0936 | 0.398* |
| | (0.139) | (0.131) | (0.105) | (0.231) |
| Self-Assessed Relative Wealth (1-5) | 0.00931 | 0.0429 | 0.0282 | 0.157 |
| | (0.0605) | (0.0571) | (0.0478) | (0.109) |
| Percent of 1957 Graduates Attending College | −0.613 | −0.361 | −0.447 | 0.700 |
| | (0.389) | (0.389) | (0.294) | (1.119) |
| Any College Preparatory Classes Reported | −0.0909 | −0.0872 | −0.0544 | −0.0635 |
| | (0.0822) | (0.0892) | (0.0903) | (0.116) |
| HS Seniors Per Teacher | −0.00944 | −0.0102 | −0.00500 | −0.0176 |
| | (0.00742) | (0.00835) | (0.00879) | (0.0109) |
| Average Teacher Post-HS Schooling | 0.116 | 0.124 | 0.137 | 0.171 |
| | (0.0794) | (0.0864) | (0.0858) | (0.113) |
| Average Teacher Pay (in $1000s) | −0.0320 | −0.0476 | −0.0549 | −0.0315 |
| | (0.0576) | (0.0634) | (0.0601) | (0.0807) |
| Total Spending (in $1,000,000s) | −0.00369 | −0.00468 | −0.00439 | −0.0135 |
| | (0.00743) | (0.00794) | (0.00785) | (0.0107) |
| Size of High School Class (1957) | | | | 0.0382 |
| | | | | (0.287) |
| IQ x HS Size x $10^{-3}$ | −0.00111 | −0.000252 | −0.0744 | |
| | (0.00184) | (0.00835) | (0.0645) | |
| IQ x (HS Size)$^2$ x $10^{-6}$ | | −0.00139 | 0.723 | |
| | | (0.0158) | (0.753) | |
| IQ x (HS Size)$^3$ x $10^{-8}$ | | | −0.320 | |
| | | | (0.382) | |
| IQ x (HS Size)$^4$ x $10^{-10}$ | | | 0.0667 | |
| | | | (0.0864) | |
| IQ x (HS Size)$^5$ x $10^{-14}$ | | | −0.531 | |
| | | | (0.711) | |
| Constant | −1.010 | −1.483** | −1.445** | −3.251*** |
| | (0.836) | (0.727) | (0.621) | (1.142) |
| Observations | 3798 | 3798 | 3798 | 3792 |

This table repeats the regressions in Table (11) using an IV Probit model (maximum likelihood structural equations) which is suitable for a binary dependant variable and continuous endogenous regressor. Robust standard errors are in parentheses. See Table (11) notes for more details.
* p < 0.10, ** p < 0.05, *** p < 0.01

Appendix Table 3: Overindentification Tests

| | Dependant Variable: Any College Applications | | | | Dependant Variable: Attending College | | | |
|---|---|---|---|---|---|---|---|---|
| | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects | Basic | Extracurricular Exists Controls | Extracurricular Size Controls | HS Fixed Effects |
| Hansen's J Chi-squared Statistic | 121.8 | 120.1 | 123.5 | 95.06 | 104.5 | 117.1 | 117.4 | 84.21 |
| Hansen J p-value | 0.0145 | 0.0187 | 0.0110 | 0.337 | 0.141 | 0.0290 | 0.0279 | 0.652 |
| Anderson-Rubin Chi-squared Statistic | 122.6 | 122.6 | 122.6 | 139.8 | 110.9 | 110.9 | 110.9 | 121.2 |
| Anderson-Rubin p-value | 0.0127 | 0.0127 | 0.0127 | 0.000610 | 0.0667 | 0.0667 | 0.0667 | 0.0159 |
| Basmann F statistic | 1.282 | 1.282 | 1.282 | 1.311 | 1.164 | 1.164 | 1.164 | 1.150 |
| Bassman p-value | 0.0394 | 0.0394 | 0.0394 | 0.0275 | 0.140 | 0.140 | 0.140 | 0.160 |

This table reports the results several overidentification tests using specifications similar to those in Appendix Table 1. Each statistic and p-value is the result of a test of the hypothesis that the instruments are not exogenous. The Hansen J test is calculated from a GMM estimate while the Anderson-Rubin and Bassman tests use a limited information maximum likelihood method.