Heterogeneous Effects of Higher Education on Civic Participation: A Research Note*

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HETEROGENEOUS EFFECTS OF HIGHER EDUCATION ON CIVIC PARTICIPATION: A RESEARCH NOTE*

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ABSTRACT

American educational leaders and philosophers have long valued schooling for its role in preparing the nation's youth to be civically engaged citizens. Numerous studies have found a positive relationship between education and subsequent civic participation. However, little is known about possible variation in effects by selection into higher education. With data from the National Longitudinal Survey of Youth 1979, I examine effects of college completion on civic participation by propensity score strata using an innovative hierarchical linear model. I find evidence for significant heterogeneity of effects: the effect of college completion on civic participation is greatest among college graduates from disadvantaged social backgrounds with a low propensity for college. The effect of college on participation decreases as the propensity for college increases.

Keywords: college education; civic participation; volunteering; causality; heterogeneity;

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The questions of how and to what extent education can and should influence civic participation have preoccupied philosophers, theorists, and social scientists for hundreds of years. From Plato and Aristotle to America's prominent educational leaders − Thomas Jefferson, John Dewey, Horace Mann, W. E. B. Dubois − education has been recognized for its role in preparing youth to be socially engaged citizens (Giroux 2009). The original missions of colleges and universities expressed this essential public purpose, and civic returns to education continue to offer a central justification for public policy promoting equal access to schooling.[1] Civic participation is broadly defined as involvement with voluntary associations, groups, or activities e.g., the United Way, Meals on Wheels, neighborhood improvement groups, or little league sports teams, or in its broadest definition participation in political activities like campaigning. Civic participation confers societal rewards by way of a vibrant democracy and well-functioning neighborhoods; it is linked to individual rewards by way of job networks, occupational advancement, and physical and mental well-being (Durkheim 1933; Putnam 2000; Wilson 2000).

A prominent tradition of social and political research seeks to identify factors that influence civic participation (Wilson 2000). This work has taken on renewed interest at a time when many forms of civic involvement appear to be declining (Putnam 2000). Numerous studies have found education to be a key correlate if not determinant of civic participation, with the more educated more participatory than the less educated (Almond and Verba 1963; Brehm and Rahn 1997; Dee 2004; Freeman 1997; Gesthuizen, van der Meer, and Scheepers 2008; Hauser 2000; Huang, van den Brink, and Groot 2008; McPherson and Rotolo 1996; Nie, Junn, and Stehlik-Barry 1996; Putnam 1995, 2000; Verba and Nie 1972; Verba, Schlozman, and Brady 1995). Putnam (1995) asserts that "education is by far the strongest correlate that I have discovered of civic engagement in all its forms" (p. 672).

While some studies recognize the endogeneity problem associated with assessing the causal effect of educational levels on civic participation (Dee 2004; Gibson 2001; Hauser 2000), studies have not addressed a related form of selection bias, i.e., heterogeneous effects by the factors influencing selection

into higher education. Individuals differ greatly not only in background attributes but also in how they respond to life events. Given the substantial literature on the relationship between education and civic participation, surprisingly little attention has been paid to variation in the effect. I estimate effects of college completion on various forms of subsequent volunteer work in civic organizations and groups by strata based on the observed probability that an individual completes college and then evaluate the trend in the strata-specific effects in a hierarchical linear model (Brand and Davis 2009; Brand and Xie [forthcoming]). This approach allows me to observe whether persons with the lowest or highest propensity for college, and thus those with disadvantaged or advantaged socioeconomic backgrounds, have the highest civic returns to college.

EDUCATION AND CIVIC PARTICIPATION

Average Effects of Education on Civic Participation

Given evidence for a significant average effect of education on civic participation, various explanations have been advanced as to why education should increase such involvement. First, individuals learn civic norms and responsibilities governing democratic society, i.e., recognition of and adherence to collective interests that override individual preferences, via socialization in schools (Brady, Verba, and Schlozman 1995; Cogan and Morris 2001; Dee 2004; Durkheim 1925; Gesthuizen, van der Meer, and Scheepers 2008; Nie, Junn, and Stehlik-Barry 1996). As Durkheim (1925) contends, education teaches students "how one should act on behalf of the collective interest" (p. 59). Despite claims that universities have lost their sense of civic purpose (Giroux 2009; Huang, van den Brink, and Groot 2009), a large number of colleges and universities actively encourage undergraduate students to participate in some form of volunteer service, and such service participation has been found to positively affect students' long-term civic commitment (Astin, Sax, and Avalos 1999; Checkoway 2001; Johnson 2004).

Second, scholars contend that education increases skills and resources that facilitate civic involvement, such as cognitive, communicative, and bureaucratic proficiency and position in social networks, and consequently reduces the costs or complexity associated with participation (Hauser 2000;

Nie, Junn, and Stehlik-Barry 1996; Verba, Schlozman, and Brady 1995). Third, higher education is associated with higher income and occupational status which in turn is associated with higher levels of civic participation. Nevertheless, when education, income, and occupational status are used together to predict participation, education remains the primary influence (Putnam 1995). Fourth, strategic mobilization of organizations and groups encourages and discourages, to varying degrees, the participation of different demographic groups: the highly educated with their higher resources are more likely to be asked to participate (Brady, Schlozman, and Verba 1999; Gesthuizen, van der Meer, and Scheepers 2008; Hauser 2000; McPherson and Rotolo 1996; Musick and Wilson 2008; Rosenstone and Hansen 1993; Wilson and Musick 1997a), and individuals tend to participate when asked (Freeman 1997).

A final explanation for the observed association between education and civic participation is selection bias (also called "pre-treatment heterogeneity bias" or "endogeneity"), i.e., that unobserved factors are correlated both with selection into higher education and civic participation producing a spurious association (Dee 2004; Gibson 2001; Hauser 2000). For example, highly educated parents are likely to be civically active and to have children who obtain high levels of education, such that an intergenerational transmission of civic participation appears as a causal effect of education (Janoski and Wilson 1995). Or ability and personality may positively affect both educational attainment of youth and social participation (Hauser 2000).[2] Or individuals with cohesive social relations with parents, teachers, neighbors, and peers in childhood may obtain higher education and be civically active (Nie, Junn, and Stehlik-Barry 1996). Scholars who attempt to account for selection bias find smaller, although still significant, effects than those who do not (Huang, van den Brink, and Groot 2009). The robustness of the correlation between education and civic participation in the face of various technical assumptions and model specifications incites most researchers to conclude that education exerts some causal effect on participation.

Heterogeneous Effects of Higher Education on Civic Participation

An issue overlooked in the literature on education and civic participation is that social scientists increasingly recognize two kinds of selection bias (Morgan and Winship 2007). The first kind is due to heterogeneity in preexisting attributes associated with both educational attainment and civic participation, i.e., pre-treatment heterogeneity bias I discuss above. The second kind is *treatment effect heterogeneity*, or systematic variation in the effect of education on civic participation. An estimate of the effect of education on civic participation is essentially a weighted average of heterogeneous effects, a quantity that depends upon composition of the college population (Angrist and Kruger 1999; Card 1999; Heckman, Urzua, and Vytlacil 2006; Morgan and Winship 2007). While homogeneous college effects are assumed in the prior literature on education and participation, it is reasonable to suppose that responses to college differ (Brand and Xie [forthcoming]). One approach to studying variation in higher education effects is estimating interactions between educational attainment and observed covariates, such as race or gender. However, examining interactions with individual covariates quickly exhausts degrees of freedom as more covariates are considered and more importantly, misses their implications for selection bias. For the question of comparing effects between those persons who obtain higher education and those who do not, the most consequential interaction is between college and the propensity for college (Heckman, Urzua, and Vytlacil 2006).

Allowing for variation in college effects, what might be the pattern in effects? I hypothesize the college effect on civic participation will be greatest among persons least likely to complete college. I premise my hypothesis on prior research suggesting that college markedly alters the life path of individuals with a low likelihood of college attainment. Brand and Xie [forthcoming] find that men and women with the lowest probability of completing college have the highest economic returns to college. Brand and Davis (2009) find that women with the lowest probability of attending and completing college have the highest fertility-decreasing effect of college. Studies that have used compulsory schooling laws, differences in the accessibility of schools, and similar features as instrumental variables have found larger economic returns (Card 2001) and larger civic returns (Dee 2004) than OLS estimates, suggesting larger effects of education among low propensity persons on the margin of school continuation.[4] Although Dee

(2004) does not reach the conclusion I do from his results as to heterogeneous effects, his findings are particularly suggestive.

It is also probable that the explanations scholars have proposed to understand average effects of college on participation are particularly pertinent to disadvantaged college goers. Low propensity college goers have parents with little education and presumably low levels of civic participation rendering college especially consequential for learning civic norms and responsibilities. College is also said to develop expanded, educated, civically active social networks, which should be especially consequential for college goers who come from more disadvantaged family and peer networks (Wilson and Musick 1997b, 1998). Likewise, mobilization of the educated by organizations and groups may be more extensive among persons from disadvantaged social backgrounds. If educated members in a particular community are in short supply, they will be in even greater demand for civic service by the less educated residents.[3]

DATA AND METHODS

Data and Descriptive Statistics

To study effects of higher education on subsequent civic participation, I use panel data from the National Longitudinal Survey of Youth 1979 (NLSY). The NLSY is a nationally representative sample of 12,686 respondents who were 14-22 years old when they were first interviewed in 1979. These individuals were interviewed annually through 1994 and are currently interviewed on a biennial basis. I use information gathered from 1979 through 2006. I restricted the sample to respondents who were 14-17 years old at the baseline survey in 1979 (n = 5,582), who had completed at least the 12th grade (n = 4,827), and who did not have any missing data on college completion, pre-treatment covariates (n = 4,229),[5] and measures of civic participation from the 2006 survey wave (n = 3,074). I set these sample restrictions to ensure all measures I use are pre-college, particularly ability, and to compare college graduates with persons who completed at least a high school education.

Table 1 list measures of observed pre-college covariates; their measurement is generally straightforward. Parents' income is measured as total family income in 1979 dollars. College-track

indicates whether or not a student enrolled in a college-preparatory curriculum in high school. 'Friends' plans' indicates the highest level of schooling a respondent reported his or her friends planned to obtain in 1979. In 1980, 94% of the NLSY respondents were administered the ASVAB, a battery of ten intelligence tests measuring knowledge and skill in areas such as mathematics and language. I first residualize each of the ASVAB tests on age at the time of the test separately by race and ethnicity. Residuals were standardized to mean zero and variance one. I then construct a scale of the standardized residuals (α = .92) which has a mean of zero, standard deviation of 0.8, and range of -2.8 to 2.6. I use three dichotomous indicators of civic participation measured in 2006 asking respondents if they performed any unpaid volunteer work in the past twelve months for (1) civic, community, or youth groups, (2) charitable organizations or social welfare groups, and (3) schools. Respondents were not asked these questions in prior survey waves, so I am unable to compare outcomes over time. I report descriptive statistics of all pre-college variables and civic participation in Table 1. The likelihood of college varies by gender, race and ethnicity, family background, academic achievement, and encouragement in the expected directions.

-- TABLE 1 ABOUT HERE --

Analytic Methods

My analysis proceeds in three steps. First, I estimate the probability an individual completes college relative to individuals who completed at least high school but did not complete college. I generate estimated propensity scores (Rosenbaum and Rubin 1983, 1984) for each individual in the sample using a logit regression model of the following form:

$$P_i = p(d_i = 1 | \boldsymbol{X}) = \log \frac{di}{1-di} = \left(\sum_{k=0}^{K} (\beta_k \boldsymbol{X}_{ik}) \right), \quad (1)$$

where P_i is the propensity score for the i^{th} observation ($i = 1, \ldots, n$); d_i indicates whether or not individual i completed college; and $\boldsymbol{X}$ represents a vector of observed pre-college covariates. I invoke an

"ignorability" or "selection on observables" assumption that conditional on a rich set of pre-treatment covariates, there are no additional confounders between college and non-college graduates.

Second, I estimate effects of higher education on civic participation under an assumption of college effect homogeneity. I evaluate average effects of college completion on the three dichotomous outcomes indicating civic participation using logit regression models controlling for the estimated propensity score:

$$\log \frac{ci}{1-ci} = \alpha + \delta d_i + \beta P_i, \quad (2)$$

where c_i is civic participation for the i^{th} observation; d_i indicates whether or not an individual completed college; and P_i represents the propensity for college completion as estimated by equation (1). The parameter δ is the average effect of college completion on civic participation. Rosenbaum and Rubin (1983, 1984) demonstrate it is sufficient to condition on the propensity score as a function of $\boldsymbol{X}$ rather than $\boldsymbol{X}$ itself, which I do here for simplicity.

Third, I assess whether or not heterogeneity in the propensity for college is associated with heterogeneity in effects of college. That is, I allow δ in equation (2) to be heterogeneous. I first group respondents into balanced propensity score strata such that average values of the propensity score and each covariate do not significantly differ between college and non-college graduates (p<.001). Then in level-1, I estimate propensity stratum-specific effects using a logit regression model:

$$\log \frac{ci}{1-ci} = \alpha_s + \delta_s d_i, \quad (3)$$

where the s subscript represents the propensity score stratum and all other terms are defined above. In level-2, I estimate the trend in the variation of effects using variance weighted least squares:

$$\delta_s = \gamma + \zeta S + \varepsilon, \quad (4)$$

where level-1 slopes (δ's) are regressed on propensity score rank indicated by S and ζ represents the level-2 slope.[6]

RESULTS

Estimated Propensity Scores

The first step in the analysis is to derive estimated propensity scores for each individual in the sample using the set of pre-college covariates described in Table 1. The results, reported in Table 2, support the literature on the determinants of college completion. Black and Hispanic students are significantly less likely to complete college. Cognitive ability, academic achievement in high school, and parents' encouragement are also strong predictors of college completion.

-- TABLE 2 ABOUT HERE --

Average Effects of Higher Education on Civic Participation

Table 3 provides the estimated average effects of college completion on volunteering in (1) civic, community, or youth groups; (2) charitable organizations or social welfare groups; and (3) schools. The results suggest college graduates are about 2.5 times more likely to volunteer for civic, community, or youth groups than non-college graduates, over 1.5 times more likely to volunteer for charitable organizations or social welfare groups, and almost 2 times more likely to volunteer for schools. Propensity for college, a conglomerate measure of social background and achievement, also has a highly significant positive effect on civic participation in all three models.[7]

-- TABLE 3 ABOUT HERE --

Heterogeneous Effects of Higher Education on Civic Participation

I next ask whether average effects of college on civic participation reported in Table 3 conceal underlying systematic heterogeneity of college effects. I first generate balanced propensity score strata such that within each interval of the propensity score (as estimated above) the average propensity score and the means of each covariate do not significantly differ between college and non-college graduates (Becker and Ichino 2002, Stata 11.0 module −pscore−). For college graduates the frequency count increases with the propensity score whereas for non-college graduates the count decreases. In general, stratum 1 is characteristic of an individual with a disadvantaged socioeconomic background and low

academic achievement and ability and stratum 7 is characteristic of an individual with an advantaged socioeconomic background and high academic achievement and ability. [See Brand and Xie [forthcoming] and Brand and Davis (2009) for examples of individual characteristics by propensity score strata in the NLSY.]

Table 4 and Figures 1, 2, and 3 report the main results, the hierarchical linear model of heterogeneous college effects on civic participation (Jann, Brand, and Xie 2008, Stata module −hte−). The level-2 slopes for all three indicators of volunteering reveal significant declines in the effect of college completion as the propensity for college completion increases. For civic, community, and youth groups, the level-2 slope indicates a significant 0.25 reduction in the college effect for each unit change in propensity score rank. That is, level-1 estimates range from a statistically significant factor of 9 times more likely ($e^{2.203}$) to volunteer for civic, community, or youth groups in stratum 1 to an insignificant factor of 2 times more likely ($e^{0.691}$) in stratum 7. Similarly for charitable organizations and social welfare groups, the level-2 slope indicates a significant 0.30 reduction in the college effect for each unit change in propensity score rank. Factors range from a significant factor of 4 times more likely to volunteer stratum 1 to an insignificant factor of 0.5 as likely to volunteer in stratum 7. For volunteer work for schools, I observe a significant 0.20 reduction in the college effects for each unit change in propensity score rank; factors range from a highly significant factor of almost 7 times more likely to volunteer for schools in stratum 1 to a marginally significant factor of 3 times more likely in stratum 7.

-- TABLE 4 ABOUT HERE --

Figure 1 for civic, neighborhood, and youth groups, Figure 2 for charitable organizations and social welfare groups, and Figure 3 for schools graphically depict the results presented in Table 4. "Dots" in Figures 1-3 represent point estimates of level-1 slopes, i.e., stratum-specific logit regression effects of college on civic participation. The linear plots in the figures are the level-2 variance-weighted least squares slopes. The figures depict the similarity of the decline in the effect of college completion on each form of civic participation as the propensity for college increases.

-- FIGURES 1-3 ABOUT HERE --

Levels of volunteerism by propensity score strata and college completion are informative as to the empirical mechanics generating the variation in effects (not shown, available upon request). As an illustration, there is little differentiation in level of volunteerism in civic, community, and youth groups by propensity score strata among the college educated: Roughly 14% of college graduates in stratum 1 and 14% in stratum 7 volunteer for civic, community, or youth groups. By contrast, less than 2% of non-college graduates volunteer for civic, community, or youth groups in stratum 1 compared to 8% in stratum 7. Thus, while levels of volunteerism by socioeconomic background are equalized among college graduates, there is a socioeconomic gradient in volunteering among non-college graduates, − generating large observed effects of college among persons from disadvantaged social backgrounds. Patterns are comparable for levels of volunteerism in charitable organizations and social welfare groups and for schools.

DISCUSSION

Americans' commitment to civic participation has been a defining feature of the cultural fabric of the United States (Tocqueville 1960[1835]). This commitment continues in our day. During a time of extensive economic upheaval, the current presidential administration has emphasized the importance of community service for the nation's recovery and renewal. The prevailing wisdom is that educational attainment is a critical determinant of civic participation. Schools function to embed the nation's youth with moral and civic norms and prepare them to participate in an informed and intelligent manner, and the educated become targets of mobilization for civic organizations and groups. While some scholars have questioned the degree to which the observed relationship between education and civic participation is causal, most researchers conclude that education exerts some causal effect.

Despite a rich literature on the overall relationship between higher education and civic participation, and despite theoretical grounds to suppose variation in effects, prior research has not considered heterogeneity in the effects of education on civic participation by selection into higher education. This study has filled this gap in the literature, and provides empirical evidence as to which

segments of the college-going population yield the largest civic returns. I find that college completion has the largest impact on volunteerism among persons least likely to complete college. The effect of college generally decreases as the propensity for college increases. This pattern in effects is generated by the equalization of volunteerism by socioeconomic background among college graduates relative to the socioeconomic gradient in volunteerism among non-college graduates. These findings complement prior sociological research showing that the relationship between social origin and destination as measured by occupational status is much weaker for college graduates than for non-college graduates (Hout 1988), as well as recent findings that college is an acutely consequential life-altering event among the most disadvantaged college-goers with the lowest propensity for college (Brand and Davis 2009; Brand and Xie [forthcoming]).

Still, just as there are those who question whether the relationship between education and civic participation is driven by selection, so too could the question be posed as to whether there is differential selection with low propensity individuals more selective than high propensity. The empirical patterns approach I use in this study hinges on the assumption that I have adequately accounted for all covariates influencing college attainment; while measurement of theoretically relevant confounders renders this assumption more plausible, it is not necessarily true. It is unfortunate that pre-college measures of volunteering are not available in the NLSY to match respondents in the propensity score stratification, and that more post-college measures are not available to study volunteering over time. As attrition is more likely among the less civically active, and as low propensity non-college goers are the least civically active, there is likely downward bias on the estimate of college in the low propensity strata − suggesting an even larger level-2 downward slope than I observe. This study is also limited in that I examine but one, momentous as it may be, aspect of educational achievement. One avenue of future research would be to examine heterogeneous effects of elite college attendance on civic participation, like Brand and Halaby (2006) do for wage and occupational achievement. Suggestive of possible heterogeneity in effects of elite college attendance, Bowen and Bok (1998) found that Black alumni of highly selective

colleges report college made greater contributions to their oral communication skills and positive attitudes toward community service than their white counterparts.

Scholars of civic participation have long focused on the individual and institutional correlates of participation. Much of this work is motivated by a conviction that participatory inequalities are democratically troublesome. Such inequalities allow some individuals to exert disproportionate influence over society, thus violating the democratic norm of equality. My findings of college effect heterogeneity demonstrate how individuals with a disadvantaged family background may effectively narrow this gap of disadvantage, thereby lessening socioeconomic inequality in social influence by way of a college education.

REFERENCES

Almond, Gabriel and Sydney Verba. 1963. *The Civic Culture: Political Attitudes and Democracy in Five Nations*, Sage Publications, Newbury Park.

Angrist, Joshua D. and Alan B. Krueger. 1999. "Empirical Strategies in Labor Economics." Pp. 1277-366 in *Handbook of Labor Economics*, vol. 3A, edited by O. Ashenfelter and D. Card. Amsterdam: Elsevier.

Astin, Alexander, Linda Sax, and J. Avalos. 1999. "Long-Term Effects of Volunteerism during the Undergraduate Years." *Review of Higher Education* 22.2:187-202.

Becker, Sascha and Andrea Ichino. 2002. "Estimation of Average Treatment Effects Based on Propensity Scores." *Stata Journal* 2: 358-377.

Bowen, William G., & Bok, Derek. 1998. *The Shape of the River: Long-term Consequences of Considering Race in College and University Admissions.* Princeton, NJ: Princeton University Press.

Brady, Henry, Kay L. Schlozman, Sydney Verba. 1999. "Beyond SES: A Resource Model of Political Participation." *American Political Science Review* 89:269-295.

Brady, Henry, Sydney Verba, and Kay L. Schlozman. 1995. "Prospecting for Participants: Rational Expectations and the Recruitment of Political Activists." *American Political Science Review* 93:153-169.

Brand, Jennie E. and Dwight Davis. 2009. "The Impact of College Education on Fertility: Evidence for Heterogeneous Effects." *California Center for Population Research Working Paper Series* PWP-CCPR-2009-017.

Brand, Jennie E. and Charles N. Halaby. 2006. "Regression and Matching Estimates of the Effects of Elite College Attendance on Educational and Career Achievement." *Social Science Research* 35:749-770.

Brand, Jennie E. and Yu Xie. [forthcoming]. "Who Benefits Most from College? Evidence for Negative Selection in Heterogeneous Economic Returns to Higher Education." *American Sociological Review.*

Brehm, John and Wendy Rahn. 1997. "Individual-Level Evidence for the Causes and Consequences of Social Capital." *American Journal of Political Science* 41:99-

Card, David. 1999. "The Causal Effect of Education on Earnings." Pp. 1801-1863 in *Handbook of Labor Economics*, vol. 3A, edited by O. Ashenfelter and D. Card. Amsterdam: Elsevier.

Card, David. 2001. "Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems." *Econometrica* 69: 1127-60.

Checkoway, Barry. 2001. "Renewing the Civic Mission of the American Research University." *The Journal of Higher Education* 72(2):125-147.

Cogan, J. J. and P. Morris. 2001. "The Development of Civic Values: An Overview." *International Journal of Educational Research* 35:1–9.

Dee, Thomas S. 2004. "Are there Civic Returns to Education?" *Journal of Public Economics* 88:1697-1720.

Durkheim, Emile. 1925. *L'Education Morale* Paris: Alcan/PUF.

Durkheim, Emile. 1933. *Division of Labor in Society*. Free Press.

Freeman, Richard B. 1997. "Working for Nothing: The Supply of Volunteer Labor." *Journal of Labor Economics* S140-S166.

Gibson, John. 2001. "Unobservable Family Effects and the Apparent External Benefits of Education." *Economics of Education Review* 20:225-233.

Giroux, Henry. 2009. "Obama's Dilemma: Postpartisan Politics and the Crisis of American Education." *Harvard Educational Review* 79(2):250-266.

Gesthuisen, Maurice, Tom van der Meer, and Peer Scheepers. 2008. "Education and Dimensions of Social Capital: Do Educational Effects Differ due to Educational Expansion and Social Security Expenditure?" *European Sociological Review* 24(5):617-632.

Grubb, W. Norton and Marvin Lazerson. 2004. *The Education Gospel: The Economic Power of Schooling*. Cambridge: Harvard University Press.

Hauser, Seth. 2000. "Education, Ability, and Civic Engagement in the Contemporary United States." *Social Science Research* 29:556-582.

Heckman, James, Sergio Urzua, and Edward Vytlacil. 2006. "Understanding Instrumental Variables in Models with Essential Heterogeneity." *The Review of Economics and Statistics* 88: 389-432.

Helliwell, John F. and Robert D. Putnam. 2007. "Education and Social Capital." *Eastern Economic Journal*. 33(1):1-19.

Hout, Michael. 1988. "More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s." *American Journal of Sociology* 93:1358-1400.

Huang, Jian, Henriette van den Brink, and Wim Groot. 2008. "A Meta-Analysis of the Effect of Education on Social Capital." *Economics of Education Review* 28:454-464.

Janoski, Thomas and John Wilson. 1995. " Pathways to Voluntarism: Family Socialization and Status Transmission Models." *Social Forces* 74(1):271-292.

Johnson, Danette Ifert. 2004. "Relationships between College Experiences and Alumni Participation in the Community." *Review of Higher Education* 27(2):169-185.

McPherson, J. Miller and Thomas Rotolo. 1996. "Testing a Dynamic Model of Social Composition." *American Sociological Review* 61:179-202.

Morgan, Stephen, and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research.* Cambridge, UK: Cambridge University Press.

Musick, Marc and John Wilson. 2008. *Volunteers: A Social Profile.* Indiana University Press.

Nie, Norham H., Jane Junn, and Kenneth Stehlik-Barry. 1996. *Education and Democratic Citizenship in America*. Chicago: University of Chicago Press.

Putnam, Robert D. 1995. "Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America." *Political Science and Politics* 28(4):664-683.

Putnam, Robert D. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.

Rosenbaum, Paul R. and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* **70**: 41–55.

Rosenbaum, Paul R. and Donald B. Rubin. 1984. "Reducing Bias in Observational Studies Using Subclassification on the Propensity Score." *Journal of the American Statistical Association* 79, 516-524.

Rosenstone, Steven J. and John Mark Hansen. 1993. *Mobilization, Participation, and Democracy in America.* Macmillan Publishing Company.

Tocqueville, Alexis de. 1960[1835]. *Democracy in America*. George Lawrence, translator. J.P. Mayer, editor. Double Day, Anchor Books.

Verba, Sidney and Norman H. Nie. 1972. *Participation in America: Political Democracy and Social Equity*. New York: Harper & Row.

Verba, Sidney, Kay L. Schlozman, and Henry E. Brady. 1995. *Voice and Equality: Civic Voluntarism in American Politics*. Cambridge: Harvard University Press.

Wilson, John. 2000. "Volunteering." *Annual Review of Sociology* 26:215-240.

Wilson, John, and Marc Musick. 1997a. "Work and Volunteering." *Social Forces 76:* 251-72.

Wilson, John, and Marc Musick. 1997b. "Who Cares?: Toward an Integrated Theory of Volunteer Work." *American Sociological Review* 62: 694-713.

Wilson, John and Marc Musick. 1998. "The Contribution of Social Resources to Volunteering." *Social Science Quarterly* 79(4):799-814.

ENDNOTES

[1] While current rhetoric on the purpose of education centers on preparation for economic roles in society (Grubb and Lazerson 2004), education's influence on civic participation remains a central theme in social and political discourse.

[2] Hauser (2000) finds that education has a significant effect on civic participation net of a reliable measure of cognitive ability.

[3] A recently debated issue is whether relative levels of education affect participation similarly to absolute levels of education. According to Nie, Junn, and Stehlik-Barry (1996), participation is negatively affected by relative education. That is, when an educational credential is rare, the holder of that credential is conferred considerable social status which incites participation. However, Helliwell and Putnam (2007), comparing the education of geographically proximate individuals rather than a national average, find that participation is positively affected by relative as well as absolute education. The debate continues as scholars try to understand falling aggregate levels of civic participation in the face of rising aggregate levels of education.

[4] Instrumental variable estimates can be interpreted as local average treatment effects, effects that pertain to units induced by the instrument.

[5] I impute missing values for parents' income (477 values), high school college-preparatory program (283 values), and parents' encouragement (129 values) based on all available background covariates.

[6] A focus on variation in treatment effects by observed covariates is limited, as I overlook heterogeneity in effects due to unobserved variables. Without the ignorability assumption, however, alternative models for heterogeneous treatment effects, e.g. switching regression or marginal treatment effects, depend upon strong parametric or exclusion assumptions about unobservable variables (see Brand and Xie [forthcoming] for a discussion of these alternative approaches).

[7] Models with the full set of covariates rather than the propensity score support the literature on civic participation: Sex, race, ethnicity, and academic achievement are related to civic participation in the expected directions. The coefficients for college completion in models with the full set of covariates are substantively similar to those with only the propensity score. Results are available upon request.

Table 1. Descriptive Statistics of Pre-College Covariates and Civic Participation (N=3,074)

	No College Completion		College Completion	
Variables	**Mean**	**SD**	**Mean**	**SD**
Sex	0.477	0.500	0.481	0.500
Race				
Black	0.170	0.376	0.083	0.277
Hispanic	0.070	0.255	0.032	0.175
Family background				
Mother's education (years of schooling)	11.201	2.399	13.139	2.406
Father's education (years of schooling)	11.128	3.057	13.932	3.252
Parents' income*	0.187	0.107	0.269	0.140
Intact family age 14 (0-1)	0.714	0.452	0.837	0.369
Number of siblings age 14	3.328	2.287	2.574	1.666
Catholic (0-1)	0.320	0.467	0.334	0.472
Southern residence age 14 (0-1)	0.338	0.473	0.291	0.454
Ability and academics				
Mental ability*	0.001	0.623	0.706	0.523
College track (0-1)	0.227	0.404	0.581	0.485
Social-psychological				
Parents' encouragement (0-1)	0.659	0.464	0.881	0.320
Friends' plans (years of schooling)	13.571	2.050	15.307	1.871
Civic Participation				
Civic, Comm., Youth Groups (0-1)	0.050	0.218	0.132	0.338
Charit. Orgs., Social Welfare Groups (0-1)	0.040	0.195	0.089	0.285
Schools (0-1)	0.078	0.269	0.210	0.407
Sample Size	2274		800	
Weighted Sample Prop.	0.68		0.32	

Notes: Parents' income is measured as total net family income in 1979 dollars. Ability is measured with a scale of standardized residuals of the ASVAB. All statistics are weighted by an NLSY panel weight.

Table 2. Propensity Score Logit Regression Models Predicting College Completion (N= 3,074)

Sex	-0.532	***
	(0.109)	
Black	-0.543	***
	(0.146)	
Hispanic	-0.826	***
	0.187	
Mother's education	-0.446	***
	(0.078)	
Mother's education^2	0.023	***
	(0.003)	
Father's education	0.076	***
	(0.020)	
Parents' inc. (1979 $1,000s)	1.394	**
	(0.522)	
Intact family	0.209	†
	(0.126)	
Num. of siblings	-0.032	
	(0.026)	
Catholic	-0.100	
	(0.126)	
Southern residence	0.152	
	(0.115)	
Cognitive ability	1.505	***
	(0.100)	
College track	0.595	***
	(0.111)	
Parents' encouragement	0.512	***
	(0.139)	
Friends' schooling plans	0.181	***
	(0.026)	
Constant	-3.685	***
	(0.599)	
LR χ^2	1154.82	
P > χ2	0.000	

Notes: Numbers in parentheses are standard errors.

† p < .10 * p <. 05 ** p < .01 *** p < .001 (two-tailed tests)

Table 3. Homogenous Effects of College Completion on Civic Participation (N= 3,074)

Logit Regression Models	Civic, Comm., Youth Groups		Charitable Orgs., Social Welfare Groups		Schools	
College Completion	0.894	***	0.468	*	0.578	***
	(0.196)		(0.219)		(0.159)	
Propensity Score	1.021	**	1.347	***	1.640	***
	(0.319)		(0.351)		(0.257)	
Constant	-3.411	***	-3.566	***	-2.951	***
	(0.127)		(0.137)		(0.102)	
LR χ^2	78.31		46.73		131.23	
P > χ2	0.000		0.000		0.000	

Notes: Numbers in parentheses are standard errors.

Propensity scores were generated by logit regression models of college completion on the set of pre-college exogenous covariates as summarized in Table 2.

* p <.05 ** p < .01 *** p < .001 (two-tailed tests)

Table 4. Heterogeneous Effects of College Completion on Civic Participation (N = 3,074)

	Civic, Comm., Youth Groups		Charitable Orgs., Social Welfare Groups		Schools	
Level-1 Slopes						
Logit Regression						
P-Score Stratum 1: [0.0-0.05)	2.203	**	1.378	†	1.912	**
Sample size = 795	(0.679)		(0.777)		(0.590)	
P-Score Stratum 2: [0.05-0.1)	1.746	*	0.587		1.356	*
Sample size = 470	(0.714)		(1.084)		(0.597)	
P-Score Stratum 3: [0.1-0.2)	0.904	†	0.611		0.669	†
Sample size = 465	(0.764)		(0.584)		(0.405)	
P-Score Stratum 4: [0.2-0.4)	0.765	*	0.511		0.578	*
Sample size = 550	(0.316)		(0.399)		(0.268)	
P-Score Stratum 5: [0.4-0.6)	0.345		1.159	**	-0.086	
Sample size = 324	(0.341)		0.427		(0.294)	
P-Score Stratum 6: [0.6-0.8)	1.087	†	-0.541		0.715	†
Sample size = 276	(0.636)		(0.437)		(0.417)	
P-Score Stratum 7: [0.8-1.0)	0.691		-0.6		1.068	†
Sample size = 194	(0.768)		(0.606)		(0.639)	
Level-2 Slopes	-0.253	*	-0.305	*	-0.196	†
Variance Weighted Least Squares	(0.124)		0.125		0.101	

Notes: Numbers in parentheses are standard errors.

Propensity scores were generated by logit regression models of college completion on the set of pre-college exogenous covariates as summarized in Table 2. Propensity score strata were balanced such that mean values of covariates did not significantly differ between college and non-college goers.

† $p < .10$ * $p <. 05$ ** $p < .01$ (two-tailed tests)

Figure 1. HLM of College Effects on Civic Participation

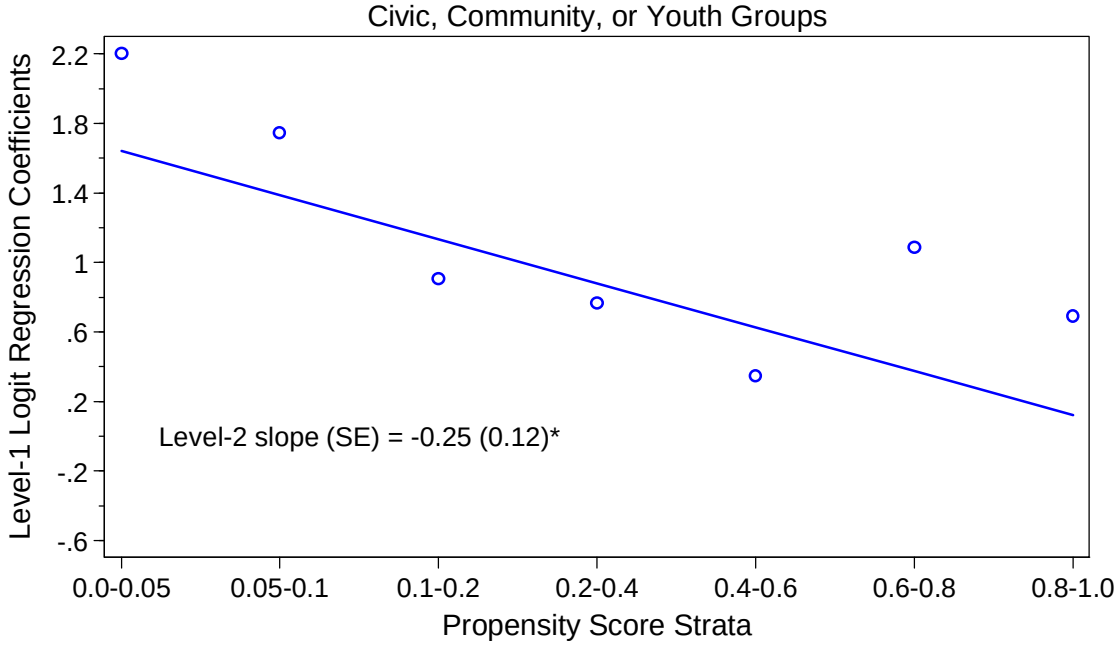

Figure 2. HLM of College Effects on Civic Participation

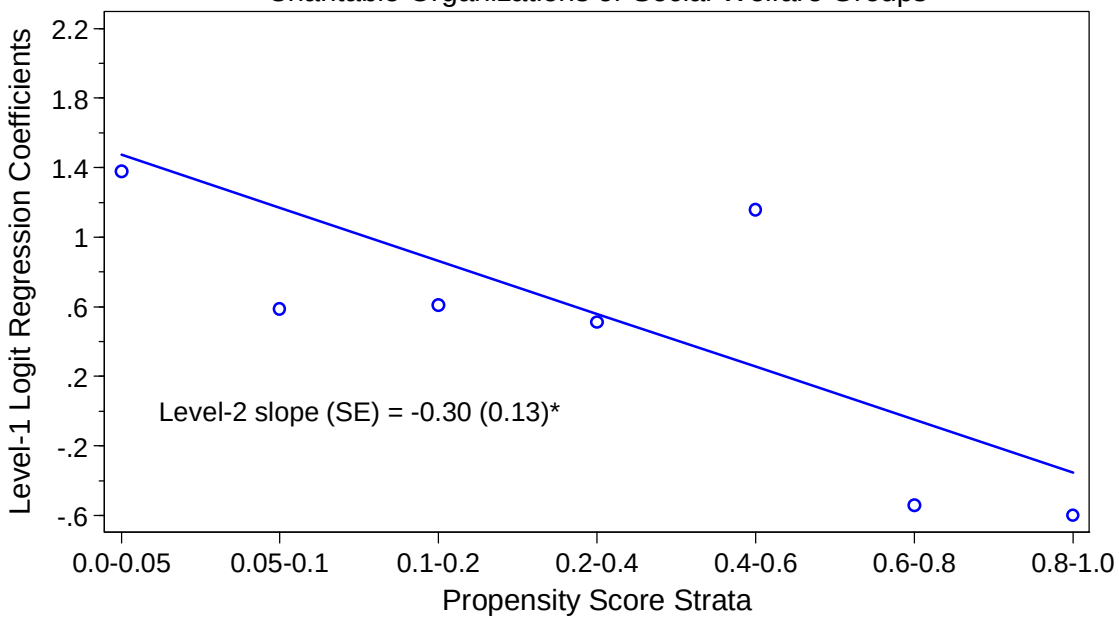

Figure 3. HLM of College Effects on Civic Participation