

**The Effect of College Education on Individual Social Trust in the United States**

**– An Examination of the Causal Mechanisms**

Tianshu Li

Quantitative Methods in the Social Sciences

Columbia University

Advisor: Gregory M. Eirich

## **Abstract**

This paper examines the influence of college education on social trust at the individual level. Based on the literature of trust and social trust, it is hypothesized that life experience/development since adulthood and perceptions of cultural/social structures are two primary channels in the causal linkage between college education and social trust. In the first part of the analysis, strong evidence is found to support the positive effect of college education on individual social trust. Omitted variable bias is tackled with an instrumental variable approach. In the second part of the analysis, hypothetical causal mechanisms are examined with the introduction of contemporary variables. Results show that individual life experience finds support to be a primary channel via which college education promotes individual social trust, while individual perceptions of cultural and social structures also explain part of the causal linkage, though less significantly.

## **Introduction**

There is a general consensus among contemporary social scientists that social trust is crucial for various aspects of social development (Delhey and Newton, 2003). It can contribute to efficiency in market economics, provision of public goods, social integration, co-operation, personal life satisfaction and even health and longevity (Delhey and Newton, 2003). Therefore, exploring the origins of trust can enable us to make practical suggestions about how trust can be increased and further benefit society.

The focus of this paper is on trust in generalized others, known as “social trust” or “generalized trust” in the existing literature. As one author explained, social trust is trust in random others or in social institutions without grounding in specific prior or subsequent relationships with those other people, and without taking into account the variable grounds for trusting particular others to different degrees (Harden, 2003). This kind of impersonal trust is especially important in highly mobile, differentiated, and individualistic societies, where social ties are weak but extensive (Delhey & Newton, 2005).

## **Literature Review**

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According to a large amount of trust and social trust literature, there are mainly two sources that influence individuals’ assessment of the trustworthiness of generalized others.

The first category is personal life experience (Brehm and Rahn, 1997; Hardin, 1996; Alesina & La Ferrara 2000, 2002; Uslaner, 2002; Paxton, 2007). Individual social trust is subject to first-hand experience of the social world and the people in it. People who have grown up in a disadvantaged position with worse-off family socioeconomic background and poorer neighborhood tend to have a lower sense of reliability or goodwill of others (Paxton, 2007). They perceive the risk of being

exploited or experiencing negative social encounters to be higher, and consequently are less likely to trust people that they do not have direct contact with. In contrast, people who have grown up in an advantaged position have a higher belief in the benevolence of human nature in general; therefore they tend to give more affirmative responses in trust surveys (Brehm & Rahn, 1997; Uslaner, 2002).

A second source of influence over people's assessments of the trustworthiness of others is the characteristics of cultural and social structures, which include norms and conventions, as well as formal/institutional arrangements in society (Huang et al., 2010). A common set of moral values can enforce the level of collective trust in a society or community (Fukuyama, 1995). Heterogeneities in the identity of social norms and conventions may mitigate people's beliefs about the willingness of others to cooperate, leading to higher distrust between members of different social, racial or ethnic groups (Knight, 2003). Zack and Knack (2001) found that cultural and social structures are the most important determinants of social trust at the national level. "Understanding the contents of social norms and conventions is the key to understanding their effects in rewarding compliance behavior and punishing noncompliance, which is fundamental in predicting the behavior of others" (Huang, Maassen & Groot, 2010, p. 291).

It is also commonly agreed upon in economic and social literature that education is an essential determinant of social trust. Higher educational attainment is found to

have a powerful effect on people's social trust level in the United States (Putnam, 2000). Putnam (1995) also produces cross-sectional data showing that education is the strongest correlate of trust. Uslaner (1999) holds the same viewpoint that education is the "single best predictor" of social trust.

However, not every country has adopted the same pattern (Putnam 2000). As suggested by Helliwell and Putnam (1999), higher average educational attainment in a society can create a climate of trust that is self-reinforcing. On the other hand, in places defined by fewer years of schooling on average, additional education may not make not increase trust due to the perception of low trustworthiness of other less-educated people. Nevertheless, the purpose of this paper is to study the situation in the United States, where people have a relatively high average educational level, so the problem described above does not apply to this paper. Similar phenomena in other regions need to be taken into consideration in future research.

Despite the perceived influence of education on individual social trust, education is considered as an exogenous independent variable and few studies have attempted to isolate the causal effect of education on social trust in most of the existing literature. There are, however, a few hypothetical theories regarding the causal linkages.

Education is one of the most important determinants of social capital, of which social trust is a crucial component; schooling spreads knowledge, the core of social capital, and cultivates social norms, (Brehm & Rahn, 1997; Alesina & La Ferrara, 2000a).

Uslaner (1999) also argues that social trust stems from the individual morality that people follow in social and daily life. As schools have an essential function of setting moral standards and equipping students with a basic sense of morality, people with more education are therefore more tolerant towards people who are not like themselves and have a higher level of trust in others. It is also argued that education makes individuals better informed and better at interpreting perceived information, so as to make them more conscious of the consequences of their own actions and those of others (Knack & Keefer, 1997; Knack & Zak, 2002).

In addition, highly educated people tend to do better economically later in life. The rich economic and social resources brought about by education enable them to bear less risks involved in trusting generalized others. Knack and Keefer (1997) and Knack and Zak (2002) argue that trust is created while individuals are educated to be better informed and better at interpreting perceived information, as well as to be more aware of the consequences of actions taken by themselves.

The effect of education on social capital has also demonstrated a substantial leap for people with college degrees (Huang et al., 2009). It is hypothesized that a college education provides a more efficient and critical context for people to learn to trust others and cultivate active civic behavior.

Huang et al. (2011) have conducted an empirical study on the causal mechanisms between college education and social trust, with data of a British cohort

from the National Child Development Study. They found strong evidence to support the substantial role of college education in promoting individual social trust. Additionally, they also verified that individual understanding of cultural and social structures is the primary channel in the causal linkage between college education and social trust. Individual later-life experience/development did not find support as a mechanism in the study.

In this study, the General Social Survey in the United States will be used to examine the role of college education and the formation of individual social trust. Econometric techniques are employed to mitigate the potential influences of confounding variables and quantify the exact degree of the effect of college education on individual social trust. In addition, the potential causal mechanisms involved in the relationship will be examined by testing two hypotheses that are established in line with the two primary sources of social trust at individual level, and in line with that examined in the paper with British Cohort dataset (Huang et al., 2011):

**Hypothesis 1** *College education promotes individual social trust by enhancing individual life experience/development.*

**Hypothesis 2** *College education promotes individual social trust by broadening an individual's perceptions of cultural/social structures.*



## **The General Social Survey Dataset**

The research questions in this study will be answered with available data from the 1991 General Social Survey (GSS) in the United States. The GSS is a valuable resource for tracking the opinions of Americans since 1972. It covers a broad range of questions including demographic, behavioral, and attitudinal questions, which makes it a good source for exploring the development of social trust and the impact of education in the United States. Although the “core” questions remain unchanged, questions related to special topics do vary from year to year. The dataset for the year 1991 is used in this study because it contains the most comprehensive set of variables to measure people’s views regarding the competence and willingness of social arrangements to enforce trustworthiness, and people’s views of the status of social norms and conventions. They collectively form the hypothetical channels through which education has influences on individual social trust.

The sampling frame for the 1991 GSS is an equal-probability multi-stage cluster sample of housing units for the entire United States. The first stage units are called National Frame Areas (NFAs), each of which is composed of one or more counties, which were stratified by region, age, and race before selection. The largest urban areas are selected in order to guarantee their representation. The second stage units are called segments, which are either a block, a group of blocks, or an entire census tract. The third stage of selection was that of blocks. They are selected with probabilities

proportional to size. The average cluster size is five respondents per cluster, which provides a balance of precision and economy (King & Richards, 1972).

The principle mode of administration for GSS is face-to-face interviews. At the block or segment level, the interviewer begins a travel pattern at the first dwelling unit from the northwest corner of the block and proceeds in a specified direction until quotas are filled (King and Richards, 1972). The quotas call for approximately equal numbers of men and women, as well as representative portions of employed and unemployed women, and men over and under 35 in the location. There are a total of 1,517 completed interviews with respondents 18 years of age or over, living in non-institutional arrangements within the United States. 41.9% of the sample population is male, while 58.1% are female.

### *Operationalization of Variables*

There are many detailed categorizations of trust in the existing literature. In this study, the concept of “general trust” takes the definition of “trust in other people when individuals come into contact with strangers in an interdependent world,” as defined by Yamigishi and Yamigishi (1994). The dependent variable will be measured by the question posed in GSS 1991: “Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?” Although some (Glaeser, Laibson, Scheinkman, & Soutter, 1999) would argue that this is too vague and

abstract a question to interpret, it is regarded as a good measure for confidence in strangers (Uslaner, 1999), and is a good indicator for general trust defined in this research. Other researchers (Uslaner 1999; Alesina & Ferrara, 2002) have also used the same variable in GSS to measure general trust.

This variable individual social trust is coded as a dummy variable with 1 representing those who trust generalized others, and 0 representing those who do not. It is recoded from the original categorical variable TRUST with 3 response categories: “can trust” with a score of 1; “cannot trust” with a score of 2; and “depends” with a score of 3. The latter two categories will be recoded into “don’t trust” with a score of 0.

The major independent variable in this study is individual college education degree. The variable DEGREE is recoded into BA, with categories of college education and above recoded into “1”, and categories of lower-level education recoded into “0”. Missing values and the response category of “don’t know” are excluded from the sample.

The first hypothesized channel through which education influences social trust is through the individual’s life experience since adulthood. It includes five indicators: respondent’s self-rated social class; respondent’s occupation prestige; respondent’s spouse’s occupation; respondent’s self-reported happiness level; and respondent’s marital status (if currently married or widowed, ever been divorced: 0 representing respondents having been divorced, and 1 representing respondents not having been divorced). All of the variables are coded with an increasing degree of social well-being. The information

transmitted by these variables enables us to explore whether education could increase an individual's belief in the benevolence of human nature in general, due to the fact that individuals with higher levels of education tend to be more likely to stay in a well-to-do environment, more confident in building close interactions with others, and more optimistic of controlling their own life-chances.

The second hypothesized channel via which education has an influence on social trust is individual's perceptions of cultural/social structures. This channel is further broken down into two categories: (1) views of the status of social norms and convention, and (2) views of the competence and willingness of social arrangement in the enforcement of trustworthiness.

The category of individual views of social norms and conventions includes four indicators: concern about whether ethnic background makes promotion different; concern about whether law breakers should be given stiffer sentences; concern about whether murderers should get death penalty; concern about whether the lot situation/condition of the average man is getting worse. Also, all the variables are coded with increasingly positive attitudes towards social norms and conventions. These indicators offer information about respondents' confidence tolerance of people from other races, and their dependence on institutional arrangements to enforce trustworthiness instead of informal constraints.

The category of individual views of the competence and willingness of social

arrangement in the enforcement of trustworthiness includes five indicators: opinion on most public officials are not really interested in the problems of the average man; opinion on whether we are spending too much, too little, or about the right amount on law enforcement; opinion on whether the government in Washington has done enough to solve the country's problems; opinion on whether we are spending too much on the nation's social security; confidence in the U.S. Supreme Court. The variables are coded with an increasing confidence in the competence and willingness of social arrangements. These indicators offer information on respondents' confidence of the goodwill and reliability of formal structural or institutional arrangements in protecting the interest of generalized people and ensuring fairness in the enforcement procedure.

The variables in the two categories above enable us to investigate whether education could expand people's horizons on economic and social change, improve their understanding of existing social values, make them more tolerant of people from heterogeneous groups and more conceding of the competence and fairness of institutional arrangements, and consequently more trusting of other people in general.

The control variables included in the model are the respondent's early-life information: gender, race, respondent's father's education level, experience of parental change when respondent was 16 years of age, and family income when respondent was 16 years of age. Other demographic variables as controls include respondent's age, residence region, and family composition. All of the control variables are expected to

have a bearing on trust. Previous studies have found a life-cycle effect on trust levels (Patterson 1999, Putnam 2000, Newton 2001), although the patterns are not always strong or consistent. Gender may also play a role in people's general trust level in the United States as Patterson (1999) finds that women are significantly less trusting than men in the United States. The reasons behind this is not clear yet, but hypotheses made by scholars include gender discrimination that makes women less socially successful and satisfied with their lives, and therefore less trusting; and more responsibility to protect their children so they have to be more careful in dealing with people (Delhey & Newton, 2003). Family income and race are two other controls that need to be taken into consideration, as Patterson (1999) finds that the poorest in America are less trusting than the richest; and irrespective of income, Afro-Americans are the least trusting ethnic group.

### **Methodology**

The objective of the analysis is to provide consistent estimates of the causal effect of college education on the individual social trust. Logit regression and instrumental variable (IV) methods are conducted in this analysis. In order for the effect of college education on individual social trust to have a causal interpretation, college education must be exogenous, which means that college education should only capture the effect of college education and not the effect of other unobserved variables that are

correlated with college education and also affect individual social trust. Suppose the generic information about individuals' personality traits are not observed in the 1991 GSS dataset, since it could be individuals' personality trait that influences both their educational attainment and social trust level, college education in the logit model would capture both its "true" effect on social trust and, indirectly, the "missing" effect of personality traits. In this case, college education does not have a true causal effect on individual social trust because both college education and social trust are jointly determined by unobserved individual personality traits (or some other unobserved characteristic). College education, in this case, is endogenous to individual social trust level.

### ***The method of instrumental variables (IV)***

The basic idea behind the IV method is to eliminate the correlation between college education and the error term that leads to biased estimates of the effect of college education on individual social trust. In this analysis, the quasi-experimental variation in college education comes from random variation in families' socioeconomic background and support for offspring's education. Mother's education degree is used as instrument for offspring's college education. Mother's education level is widely used in existing literature as an instrument for offspring's education (Card, 1999). It is expected that mother's education degree is positively correlated with offspring's college education.

And it is expected to be uncorrelated with individual social trust. Two-Stage Least Squares (2SLS) model is used to analyze the effect of college education with the involvement of the instrumental variable.

### **Descriptive Statistics**

Table 1 provides summary statistics of all the variables used in this study. The sample studied in this paper contains 1,013 observations, 38.5% of which indicate that most people can be trusted, and around 20% of the respondents have a college degree or above.

For individual early-life background variables, around 27% of the individuals experienced parental change at or before the age of 16. Respondents are generally happy about their lives, with an average of 1.80 on a scale of 1-3. Overall, respondents' views on the competence and willingness of social arrangements in the enforcement of trustworthiness lean towards being less favorable. All the variables under this category are coded so that higher values represent better recognition of the competence and willingness of social arrangements. However, the majority of the variables have a mean below their median, which in most cases would represent a neutral standpoint. The same situation applies to respondents' general view of the status of social norms and conventions, which tends to be more pessimistic, as all the variables under this category have their means below their medians.



Comparing respondents with at least a bachelor's degree to those who did not receive college education, Table 2 shows significant differences between the two groups in almost all variables describing individual early-life background, individual characteristics since adulthood, views towards competence and willingness of social arrangements in the enforcement of trustworthiness, and views of the status of social norms and contentions. On average, 24.96% more of the respondents with a bachelor degree (BA group) would trust generalized others than respondents without college education (non-BA group). This difference is statistically significant at the 0.001 level. As expected, there is a higher proportion of males and white people in the BA group. They also tend to have early-life background advantages: their fathers' education level is higher, family income is higher, and they tend to experience less parental change at or before the age of 16. The higher-educated group also tends to have better individual characteristics since adulthood, with higher average self-reported social class, higher average spouse's occupation prestige, higher general happiness level, and also lower previous divorce rate if currently married or widowed.

In general, people with a college education hold a more optimistic view towards the competence and willingness of social arrangements in the enforcement of trustworthiness, and they are more optimistic towards the status of social norms and conventions. All the variables under these two categories show a statistically significant difference between the two comparative groups, with the BA group holding a more

optimistic standpoint, except for the variable representing people's opinion towards public spending on law enforcement. As shown in Table 3 and Figure 1, BA and non-BA respondents do not differ much in the percentage distribution of the response categories regarding public spending on law enforcement. Non-BA respondents have a higher percentage of people saying government is spending either too little or too much on law enforcement compared to BA holders. But the difference is not big enough and the two opposing answers cancel each other out to some extent. Therefore, the difference between BA and Non-BA groups is not statistically significant. The majority of both groups would think that government is spending too little on law enforcement.

### **Results from the Empirical Examination**

#### ***i. Identification of the Effect of College Education***

In the first step of the empirical study, logit regression is employed in the analysis to quantify the effect of college education on individual social trust. The findings are presented in Table 1. The baseline logit model includes demographic characteristics, residence region, and family composition as control variables. A statistically significant estimate of the college effect is observed. The estimated coefficient of college education variable is 0.995 (p-value<0.001) in terms of log odds. It indicates that the level of social trust of those with college degree, other conditions being equal, exceeds that of those without a college degree by 0.995 logit point. In the

full-specification logit model, where father's education level, parental change since young, and family's income level at 16 are added in the equation, the estimated coefficient of college education drops from 0.995 to 0.772, although the latter remains statistically significant ( $p\text{-value} < 0.001$ ).

Since individual's educational attainment and the development of social trust can be simultaneously affected by some individual characteristics that are time-invariant and unobservable, the logit estimator may suffer from omitted variable bias. The 2SLS (Two Stage Least Squares) method is employed as an endogeneity model to identify the real causal effect through the exogenous variation in educational attainment induced by the instrumental variable –mother's education degree. The estimated coefficient on college education in the 2SLS model is 0.183, which is marginally statistically significant at 0.1 level.

This coefficient in the 2SLS model is even larger than the coefficient on education in the OLS model with the same variables, which is 0.638. It is generally expected that the OLS methods will lead to upward-biased estimates of the college effect because there are omitted variables that are associated with education that also lead to higher trust levels (things like family background, temperament and genetics). However, the reverse results are obtained here with regard to trust and actually in many recent studies with different dependent variables. There are several explanations for such phenomena. Bound and Jaeger (1996) suggested that the bias is induced by unobserved

differences between the characteristics of the treatment and comparison groups implicit in the IV scheme. Griliches (1977), and Angrist and Krueger (1991) proposed that it reflects the *downward bias* in the OLS estimates attributable to measurement errors. Ashenfelter and Harmon (1998) hypothesized that while looking for a statistically significant IV estimate, researchers are more likely to select a specification that provides a large point estimate of the effect of education. All the arguments made above provide potential explanations for the gap observed between the OLS and 2SLS coefficients in this model.

Nevertheless, the null hypothesis that college education is exogenous is not rejected either with the Durbin-Wu-Hausman test or with the Wu-Hausman test. It indicates that we cannot reject the exogeneity of college education in this model, and that omitted variable bias is not a severe problem in the estimation of the college effect.

A test of the strength of the instruments is also carried out. With a p-value of 0.000, the instrument found support to be significantly different from zero. And the F statistic is 13.212, which indicates that mother's education degree is a strong instrument for offspring's college education. However, their partial R squared is only 0.020, which casts concern over the strength of the instrument.<sup>1</sup> Therefore, it was not fully possible to find an instrumental variable that met the entire set of criterion, and so it may not be surprising that the coefficient on trust is not much different from the OLS estimate.

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<sup>1</sup> The first stage regression results are available in Appendix Table A.

The exogeneity of college education suggests that the rich information of early-life development, especially father's education level, parental change since young, and family's economic status when respondents are at 16-year-old, is key for reducing the probability of unobserved characteristics in childhood and adolescence influencing individual educational attainment and social trust simultaneously (this is often what Card (1999) found in this review of the instrumental variable approach).<sup>2</sup> Therefore, the instrumental variable approach will not be used in the following analysis.

The results from the full-specification logit model indicate that the level of social trust of college graduates is 0.772 of a logit higher than those without a college degree. This confirms the significance of college education in the formation of individual social trust. However, these statistics do not provide any unobserved mechanisms to explain how college education contributes to the building of social trust. The theoretical expectation about the role of education remains hypothetical and untested.

***ii. The Investigation of the Hypothetical Mechanisms***

The findings from the last section do not clarify how college education fosters social trust. In the second step, contemporary information is introduced to examine whether individual experience/development and individual perceptions of cultural/social

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<sup>2</sup> Some early-life variables appear statistically significant in the equation of social trust across all evaluation methods. These estimates do not necessarily reflect the true causal effects or the direct influences on individual social trust. The variables are included in the regression to reduce omitted-variable bias in the logit model and to assure the conditional validity of the instrumental variable. The regression statistics of the key variables are presented in Appendix Table B.

structures are the primary channels in the causal linkage between college education and social trust.

The contemporary variables applicable to the hypothetical channels are drawn from the 1991 General Social Survey, the same survey from which information on social trust is collected. As presented in Table 5, the contemporary variables are classified into three categories: Category i – characteristics of life experience/development since adulthood, Category ii – views on the competence and motives of formal/institutional arrangements in the enforcement of trustworthiness, and Category iii – views on the status of social norms and conventions. Contemporary variables in category ii and category iii represent the heterogeneities in individual perceptions of cultural and social structures. It is classified according to the formal contextual characteristics and the informal contextual characteristics.

In the regressions testing the hypothetical channels, each contemporary variable is introduced separately into the original logit regression of social trust, with all early-life variables remaining in the equation.<sup>3</sup> The change in the coefficient of college education is examined due to the introduction of the contemporary variables. If, for example, college education is a key determinant of general happiness of life, the variation of happiness, on account of education differences, is strongly and positively associated with the variation in social trust, the introduction of life happiness in the original

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<sup>3</sup> Logit model is applied because it is confirmed in the previous section that there is no sign of omitted-variable bias in the identification of college education, when a rich set of early-life information has been controlled for.

full-specification logit regression should pick up, at least partially, the causality from college education to social trust. A substantial drop in the estimate of the college effect is then expected.

Table 6 presents the coefficient on college education after each contemporary variable is introduced into the full-specification logit model separately. There is mostly a substantial drop in the estimates of the coefficients on college education following the introduction of contemporary life development variables in category i, except for the general happiness level. The four estimates that have dropped range from 0.417 to 0.766, which are 5% - 42% smaller than the estimate identified by the full-specification logit model. It turns out that lower-educated people have lower self-rated social class, lower occupational prestige both of themselves and of their spouse, and are more likely to have experienced divorce if currently married or widowed. Nevertheless, by controlling for people's general happiness level, the coefficient on college education has increased by 1.6%. In addition, the coefficient on happiness is not statistically significant, which indicates that happiness level is not a strong explanatory variable on individual social trust. Such finding contradicts the original expectation.

Controlling for the heterogeneities in category ii (views of formal or institutional arrangements) causes a moderate drop in the estimates. The views towards whether government in Washington is trying to do too much and people's confidence in the Supreme Court have a trivial effect on the estimates of the coefficient on college

education, while people's confidence in public spending on social security lead to a 9% drop in the estimate. Inversely, the views of the government in terms of being interested in the problem of average man lead to an increase in the coefficient estimate, though small in size. Some of the additional trust that college graduates have is due to they have greater confidence in the reliability and goodwill of formal structural or instructional arrangements in protecting the interest of generalized people and ensuring fairness in the enforcement procedure.

Controlling for the heterogeneities in category iii (views of social norms and conventions), there is a moderate decrease in the estimates as well. The most substantial drop in the estimate is 38% while controlling for the opinions of whether murderers should get death penalty. Nevertheless, all the estimates of the coefficients on college education in this category are not statistically significant at 0.05 level. One hypothesized explanation for the lack of statistical significance at all in this analysis is that-the sample size is too small (n=190), while excluding all the missing values of the variables. Another reason for why college education is not a statistically significant predictor is because this subsample is not fully representative of the total sample. It is more college educated, more male, more white and younger than the overall sample, and samples of the investigation into variables in category i and category ii.<sup>4</sup> There is some, but not very strong evidence, that the college-educated respondents' confidence in social

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<sup>4</sup> The demographic characteristics of different samples are available in Appendix Table C.



norms and conventions is responsible for their higher trust levels.

For a more perceptual comparison, Fig. 1 bar graphs for the estimate of coefficient on college effect obtained from the original logit model in which no contemporary variable is included, and from the augmented-logit model in which the entire set of contemporary variables in category i, category ii, and category iii are included separately as control variables. As shown in the graph, controlling for the entire set of category i indicators reduces the estimate by 50% (from 0.838 to 0.417), and the Pseudo R2 of the model increases by 39% (from 0.070 to 0.097). Controlling for the entire set of category ii indicators and category iii indicators lead to a decrease of the coefficient estimates by 8% (from 0.807 to 0.793) and 29% (from 0.550 to 0.388) respectively. The pseudo R2 of the two models increases by 50% (from 0.074 to 0.108) and 86% (from 0.056 to 0.104), respectively. Information contained in category ii and category iii depict individual perceptions of cultural and social structures. Controlling for both category ii and category iii variables in the regression reduces the estimate of coefficient on college education by 45% (from 0.512 to 0.283), while the pseudo R2 increases by 124% (from 0.054 to 0.121). These findings suggest that a college education experience strongly enhances individual development in adulthood. It is also effective in increasing people's confidence in social arrangement in the enforcement of trustworthiness. There is a lack of evidence that college education would help foster individual social consensus on normative values that create an incentive to honor trust,

which might be due to limited size of the sample. Nevertheless, the pseudo-R square obtained from the logit estimation are similar for these three categories, which indicates that contemporary variables in category i have the same explanatory power as those in category ii or category iii. All in all, the investigation provides substantial evidence to support the hypothesis that individual life experience/development is the key channel in the causal linkage between college education and social trust. Individual perceptions of cultural and social structures play an important role in the causal linkage as well, though the magnitude of the influence is not as significant as individual life development since adulthood. The two channels both have strong explanatory power towards individuals' social trust level.

**iii. *Early-Life Backgrounds versus Contemporary-Life Development***

The investigation based on contemporary variables indicates that individual life experience/development since adulthood is a key channel in the causal connection between college education and social trust. However, trust can be learned in early life and develops as part of a core personality trait, unless challenged by trauma (Uslaner, 2002; Stolle, 2002). Family background and environmental influences are considered to have a direct and enduring influence on individual social trust. It is also well documented that the heterogeneities in family and environmental parameters are a major source of the variations in offspring's socioeconomic status. Therefore, there is concern

that the association between contemporary-life success (economic conditions, social class and life happiness) and social trust reflects, at least partially, the lasting effect of early-life factors on individual development and social trust in the life course.

To examine the concern, the following section breaks down the outcome variable of social trust with early-life information by a logit model.<sup>5</sup> The residual variable of social trust denotes the variations of social trust that cannot be explained by early-life information. Given that contemporary life status has a direct and strong influence on individual social trust, which is not attributable to the lasting effect of childhood experience and adolescence experience, it is expected that a strong correlation between the residual variable and the contemporary variables of current-life success (social class, occupation prestige, happiness level, and marital status). As shown in Table 4, indeed, all the contemporary variables of current-life success, except for happiness level, remain statistically significantly correlated with the residual variable of social trust that cannot be explained by the early-life variables. All of them have a very strong correlation with the outcome variable of social trust. In addition, the correlation coefficients have a drop of 14% to 28% for these contemporary variables.

Table 7 indicates a large proportion of the correlations between indicators of development/success since adulthood and social trust are not attributable to the lasting

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<sup>5</sup> The early-life information comprises information on childhood experience and information on adolescence experience. All the variables in the previous analysis (except educational attainment) are included as indicator of adolescence experience or development. Indicators of childhood experience or development in the survey are also included.

effect of experiences formed in childhood and adolescence. This suggests that college education indeed has some causal influence on social trust via its power in promoting development in adulthood.

*iv. Comparison with British Cohort*

Huang, Brink and Groot (2011) conducted a similar analysis with the dataset of a British cohort born in 1958 from the National Child Development Study (NCDS), a longitudinal dataset comprised of all those living in the UK (England, Scotland and Wales). The information used in their paper is also extracted from the 1991 survey, which is that same year as the American General Social Survey used in this paper is carried out. In their paper, the authors also found strong evidence to support the substantial role of college education in promoting individual social trust. However, they fail to find support that individual experience is a key channel through which college education would influence social trust. The authors proved that a large proportion of the associations between contemporary-life success and social trust were attributable to the lasting effect of experiences formed in childhood and adolescence. In addition, in their paper, individual understanding of cultural and social structures explains 77% of the college effect on social trust, which makes it a more significant channel explaining the influence of college education on individual social trust.

The results achieved in the paper of Huang, Brink and Groot (2011) with British

cohort data deviate from results achieved in this paper to some extent. Although in both papers college education is found to have a significant influence on individual social trust, the channel through which such influence pervades leans towards the enhancement of individual well-being in adulthood for American people. For British people, the second hypothetical channel plays a more important role, that college education plays a positive and fundamental role in expanding the horizon of individuals on economic and social change, making people more open-minded to accept people from different races and inspiring consensus on normative values and affirmative attitude toward institutional arrangements.

Cross-national differences may be due to cultural factors in the US and UK. For example, the British college education system is known as more rigid, conservative and theoretical, while the US college education system is more liberal and practical (Bagley, 1970; Bowen, Kurzweil, Tobin, & Pichler, 2006). These different styles may foster different values of students in the two education systems to pursue, where the British emphasize more on cultural and social structure learning, while the typical “individualism” value in the United States encourages individuals to pursue personal wealth and social status more.

Additionally, different operationalization of the variables in the two studies may also contribute to the varying results. Due to the limitation of the GSS dataset, indicators in the NCDS such as capacity in handling/avoiding argument, younger

generations' respects on traditional values, and disparities in the existing law for the rich and the poor cannot find their corresponding variables in the GSS. Therefore, different variables are used in this analysis to represent the same underlying concepts as in the British study. Also, certain aspects of the concepts may be lack of representation in this study, such as the capacity to handle argument as one facet of life development since adulthood, young generations' respect on traditional values as one aspect of the status of social norms and conventions, and the disparities in existing laws for the rich and the poor as one dimension of concerns for the competence of social arrangement in the enforcement of trustworthiness.

Another issue to notice is that students' length of schooling absence is used as the instrument for college education in the British paper. Although it failed to find support for the endogeneity of college education, this variable could indeed be a better instrument for college education than those used in this paper (father's religious attendance, mother's education level, and the number of siblings the respondent has).

Another explanation for the difference between this study and that conducted using the British Cohort is the age distribution in these two datasets. Specifically, the British cohort was all born in 1958, which means they were all at around the age of 33 while the survey was conducted, whereas the sample in the 1991 GSS covers all people with age of 18 or above. There might be specific events that influence the 1958 British cohort and do not apply to people of other ages, and they contribute to the specific pattern

of how college education affect individual social trust. All the hypotheses above remain untested and require further investigation in future research.

### **Conclusion**

In this paper, the role of college education in the formation of social trust is examined with the American General Social Survey. The existing literature on the micro aspects of social trust considers life experience/development and perceptions of cultural/social structures as two primary sources of social trust at individual level. In the empirical study, the causal effect of college education is quantified and the validity of the hypothetical mechanisms in the causal mechanisms of the college education on individual social trust is tested.

To mitigate the influences of confounding variables is the key to quantify the causal effect of college education. The models may face omitted-variable bias if time-invariant and unobservable factors are ignored while they affect both college education and individual social trust. To identify the overall causal effect of college education, contemporary indicators of individual development or individual perceptions of cultural/social structures should not be included as the explanatory variables.

Because these contemporary variables are subject to the influences of educational attainment, conditioning on them would block the part of the causal effect of college education that acts through these variables.

In the first part of the empirical analysis, strong evidence is found of the substantial role of college education to promote individual social trust. The rich information of adolescent development and experience is crucial in reducing omitted-variable bias. The estimate obtained from the baseline logit model, which only controls for demographic characteristics, residence region, and family composition, is 29% larger than the estimate obtained from the full-specification logit model. Lack of information of adolescence development and experience indeed cause an upward omitted-variable in the estimation. The 2SLS model, which uses father's religious attendance, mother's education level, and the number of siblings individual has as instruments, indicate that college education is exogenous and the IV approach is not necessary while evaluating the causal effect of college education on individual social trust. There is no endogeneity issue in the existing full-specification logit model.

In the second part of the empirical analysis, the change in the coefficient of college education is examined due to the introduction of individual information of contemporary-life experience/development and contemporary perceptions of cultural/social structures. The hypothesis that individual experience is a key channel from college education to social trust found strong support in the investigation. There is a 50% drop in the estimate due to the introduction of economic conditions, personal happiness and marital status. Further analysis shows that the association between contemporary-life success and social trust are indeed not attributable to the effect of



experiences formed in childhood and adolescence.

Individual understanding of cultural and social structures is a less significant channel through which college education would influence individual social trust. There is a 45% drop in the estimate when individual views of competence and willingness of social arrangements and status of social norms and conventions are all introduced into the model. However, when investigated separately, there is only a drop of 9% with introduction of views towards social arrangements and a drop of 29% with the introduction of views on status of social norms and conventions. The latter one has also identified insignificance of college education with the sample restricted to non-missing values of the variables. The fact that college education would expand the horizon of individuals on economic and social change, making individuals more open-minded to accept people from other races, and inspiring consensus on normative values and affirmative attitude toward institutional arrangements is less crucial than help develop individual well-being and success that would eventually increase individual social trust level.

This paper contributes to the existing literature by providing strong econometric evidence to support the positive role of college education in fostering individual social trust. It also provides an estimate approximating the true causal effect of education by controlling for early-life information, which avoids education endogeneity in the estimation. A 2SLS regression is also conducted to eliminate the possibility of

endogeneity of college education in the model. More importantly, this study verifies that individual life experience and development is the primary channel in the causal linkage between college education and social trust, while individual understanding of cultural and social structures also plays a role in the causal linkage, though less significant.

Nevertheless, there are several drawbacks in this paper that calls for further improvements. The operationalization of the variables in this study may not best represent the concept under examination. A more concrete dataset is needed in order to measure individual development characteristics and views towards social norms and structures more accurately. In addition, the choice of instrumental variables is limited in this study with the existing variables in 1991 GSS. Failure to reject the exogeneity of college education may also be attributable to the weakness of instrument used. Stronger instruments need to be found in future study so as to provide a more accurate examination of the causal linkage between college education and individual social trust.

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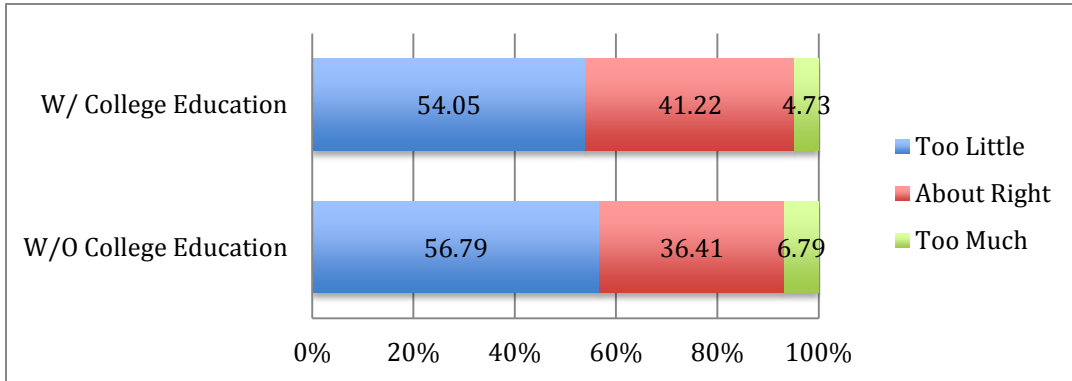
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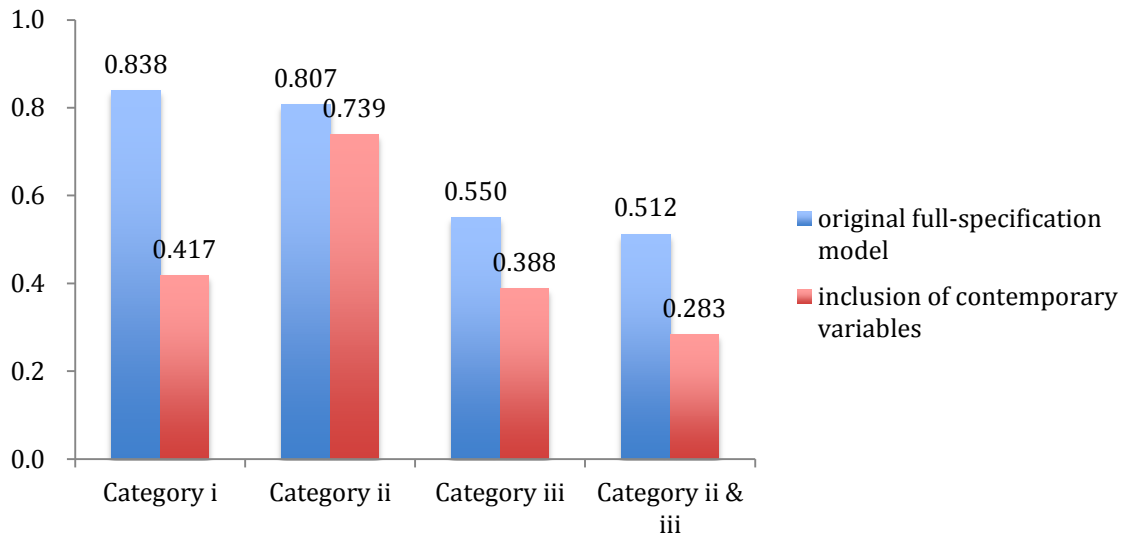
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## Figures & Tables

**Fig 1.** Percentage distribution of people's opinions towards public spending on law enforcement



**Fig 2.** Bar graph for college education effect



**Table 1.** Descriptive Statistics of the Main Variables

	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b><i>Main outcome variable</i></b>					
Individual social trust	1,013	38.50%	0.49	0	1
<b><i>Main independent variable</i></b>					
College education	1,508	20.23%	0.40	0	1
<b><i>Early-life Variables</i></b>					
Father's highest year of school completed	1,069	10.88	4.13	0	20
Parental change at around 16	1,517	27.36%	0.45	0	1
Level of family income at 16-year-old	1,492	2.80	0.88	1	5
<b><i>Individual Characteristics</i></b>					
Social class	1,509	2.49	0.64	1	4
Respondent's occupation prestige	1,418	42.93	13.07	17	86
Spouse's occupation prestige	762	44.13	13.35	17	86
General happiness level	1,504	2.20	0.62	1	3
If currently married or widowed, ever been divorced	968	79.34%	0.41	0	1
<b><i>Views of competence and willingness of social arrangements in the enforcement of trustworthiness</i></b>					
Most public officials are interested in the problems of the average man	951	1.30	0.46	1	2
Public spending on law enforcement	725	1.50	0.62	1	3
Government in Washington is trying to do too many things that should be left to individuals and private business	942	2.94	1.17	1	5
Public spending on social security	1,414	1.50	0.58	1	3
Confidence in U.S. Supreme Court	967	2.26	0.67	1	3
<b><i>Views of the status of social norms and conventions (optimistic vs. pessimistic)</i></b>					
Ethnic background makes promotion different	880	0.34	0.47	0	1
Law breakers should be given stiffer sentences	1,326	1.78	0.80	1	5
Murderers should get death penalty	1,295	1.99	1.26	1	5
The lot (situation/condition) of the average man is getting better, not worse	943	1.39	0.49	1	2
<b><i>Other Control Variables</i></b>					
Male	1,517	41.92%	0.49	0	1

White	1,517	83.32%	0.37	0	1
Age	1,514	45.63	17.81	18	89
Residence region	1,517	4.89	2.47	1	9
Family composition (number of people in household)	1,516	2.59	1.42	1	10

**Table 2.** Descriptive Comparisons between Students with College Education and Students without College Education

	W/O College Education	W/ College Education	Difference	Stat.Sig
<b>Main dependent variable</b>				
Individual social trust	33.33%	58.29%	24.96%	***
<b>Early-life Variables &amp; Selected Control Variables</b>				
Male	39.98%	49.51%	9.52%	**
White	81.80%	90.82%	9.02%	***
Father's highest year of school completed	10.20	12.94	2.74	***
Parental change at around 16	30.34%	15.74%	-14.60%	***
Level of family income at 16-year-old	2.72	3.14	0.42	***
<b>Individual Characteristics</b>				
Social class	2.39	2.87	0.48	***
Respondent's occupation prestige	39.74	54.78	15.05	***
Spouse's occupation prestige	41.60	52.74	11.13	***
General happiness level	2.17	2.33	0.16	***
If currently married or widowed, ever been divorced	77.42%	87.17%	0.10	**
<b>Views of competence and willingness of social arrangements in the enforcement of trustworthiness</b>				
Most public officials are interested in the problems of the average man	1.27	1.44	0.17	***
Public spending on law enforcement	1.50	1.51	0.01	



Government in Washington is trying to do too many things that should be left to individuals and private business	2.87	3.20	0.33	***
Public spending on social security	1.46	1.66	0.21	***
Confidence in U.S. Supreme Court	2.21	2.44	0.24	***
<b><i>Views of the status of social norms and conventions (optimistic vs. pessimistic)</i></b>				
Ethnic background makes promotion different	0.32	0.38	0.07	*
Law breakers should be given stiffer sentences	1.76	1.89	0.13	**
Murderers should get death penalty	1.93	2.27	0.34	***
The lot (situation/condition) of the average man is getting better, not worse	1.36	1.52	0.16	***

**NOTES:**

- two-tailed statistical significance test

- \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%

**Table 3.** Percentage Distribution of People's Opinions on Public Spending on Law Enforcement

		<b>W/O College Education</b>	<b>W/ College Education</b>
<b><i>Law Enforcement</i></b>	Too Little	56.79	54.05
	About Right	36.41	41.22
	Too Much	6.79	4.73

**Table 4.** Estimates of the Effect of College Education in Logit Model

	<u>College Education</u>		Endogeneity test
	Coefficient	SE	p-value
Baseline logit	0.995***	0.165	-
Full-specification logit	0.772***	0.195	-
OLS	0.183***	0.045	
2SLS	0.638*	0.343	0.168 (Durbin chi2) 0.171 (Wu-Hausman F)

\* Significant at the 10% level

\*\*\* Significant at the 1% level

The coefficients are reported as log odds change

**Table 5.** Contemporary variables for the examination of the hypothetical mechanisms

<b>i. Indicators of life experience and development since adulthood</b>	<ul style="list-style-type: none"> <li>a. Self-rated social class</li> <li>b. Respondent's occupation prestige</li> <li>c. Spouse's occupation prestige</li> <li>d. General happiness level</li> <li>e. If currently married or widowed, ever been divorced</li> </ul>
<b>ii. Views of competence and willingness of social arrangements in the enforcement of trustworthiness (optimistic vs. pessimistic)</b>	<ul style="list-style-type: none"> <li>a. Most public officials are interested in the problems of the average man</li> <li>b. Public spending on law enforcement</li> <li>c. Government in Washington is trying to do too many things that should be left to individuals and private business</li> <li>d. Public spending on social security</li> <li>e. Confidence in U.S. Supreme Court</li> </ul>
<b>iii. Views of the status of social norms and conventions (optimistic vs. pessimistic)</b>	<ul style="list-style-type: none"> <li>a. Ethnic background makes promotion different</li> <li>b. Law breakers should be given stiffer sentences</li> <li>c. Murderers should get death penalty</li> <li>d. The lot (situation/condition) of the average man is getting better, not worse</li> </ul>

**Table 6.** Estimates of the college effect after controlling for contemporary variable

	Coefficient on			Pseudo
	College	SE	N	R2
	Education			
<b>Category i: Individual Characteristics</b>				
Original full-specification model	0.838***	0.254	374	0.070
Social class ( <i>not statistically significant</i> )	0.706***	0.272	374	0.074
Respondent's occupation prestige**	0.573**	0.281	374	0.079
Spouse's occupation prestige*	0.711***	0.264	374	0.076
General happiness level( <i>not statistically significant</i> )	0.851***	0.256	374	0.070
If currently married or widowed, ever been divorced***	0.766***	0.257	374	0.083
Inclusion of all variables within category i	0.417**	0.297	374	0.097
<b>Category ii: Views of competence and willingness of social arrangements in the enforcement of trustworthiness</b>				
Original full-specification model	0.807***	0.299	293	0.074
Most public officials are interested in the problems of the average man***	0.817***	0.305	293	0.093
Government in Washington is trying to do too many things that should be left to individuals and private business ( <i>not statistically significant</i> )	0.800***	0.3	293	0.075
Public spending on social security*	0.736**	0.303	293	0.081
Confidence in U.S. Supreme Court***	0.784***	0.304	293	0.092
Inclusion of all variables within category ii	0.739**	0.311	293	0.108
<b>Category iii: Views of the status of social norms and conventions (optimistic vs. pessimistic)</b>				
Original full-specification model	0.550	0.36	190	0.056
Ethnic background makes promotion different ( <i>not statistically significant</i> )	0.627*	0.374	190	0.059
Law breakers should be given stiffer sentences**	0.466	0.209	190	0.079
Murderers should get death penalty***	0.340	0.372	190	0.086
The lot (situation/condition) of the average man is getting better, not worse*	0.518	0.364	190	0.067
Inclusion of all variables within category iii	0.388	0.394	190	0.104
<b>Category ii&amp;iii</b>				
Original full-specification model	0.512	0.38	170	0.054

Inclusion of all variables within category ii & iii 0.283 0.431 170 0.121

\*Significant at the 10% level

\*\*Significant at the 5% level

\*\*\*Significant at the 1% level

**Table 7.** Evidence of the lasting effects of early-life backgrounds on the development of social trust

Development/success since adulthood	Residual variable of social trust			Outcome variable of social trust		
	Coef.	p-value	N	Coef.	p-value	N
Social class	0.088	0.003	696	0.122	0.000	696
Respondent's occupation prestige	0.005	0.001	665	0.007	0.000	665
Spouse's occupation prestige	0.005	0.003	385	0.007	0.000	385
General happiness level	0.038	0.204	692	0.046	0.137	692
If currently married or widowed, ever been divorced	0.146	0.007	453	0.162	0.004	453

## Appendix

**Appendix Table A.** First-stage regression summary statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,639)	Prob>F
College Education	0.154	0.142	0.020	13.212	0.000

**Appendix Table B.** Regression statistics of key covariates in the estimations of social trust

	Logit		2SLS	
	Coef.	SE	Coef.	SE
Male	-0.209	0.164	-0.067	0.044
White	1.137***	0.293	0.242***	0.064
Age	0.008	0.006	0.000	0.002
Residence region	-0.073**	0.032	-0.017**	0.008
Family composition (number of people in household)	-0.047	0.062	0.002	0.015
Father's highest year of school completed	0.050**	0.024	-0.007	0.014
Parental change at around 16	-0.498*	0.274	-0.049	0.077
Level of family income at 16-year-old	0.005	0.104	-0.011	0.029
N	698		644	

The coefficients are reported as logit change

\* Significant at 10%, \*\* Significant at 5%, \*\*\* Significant at 1%

**Appendix Table C.** Demographic characteristics of various samples

Demographic Characteristics	Whole Sample		Category i Sample		Category ii Sample		Category iii Sample	
	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean
College Education	1508	20.23%	723	23.24%	395	22.53%	483	26.09%
Male	1517	41.92%	724	45.72%	396	46.46%	485	52.37%
White	1517	83.32%	724	89.36%	396	84.34%	485	87.42%
Age	1514	45.63	723	45.87	396	44.80	485	39.18
Respondent's occupation prestige	1418	42.93	724	43.99	374	43.86	485	43.89
Respondent's income	912	9.18	477	9.51	244	9.61	440	9.70
Family composition (number of people in household)	1516	2.59	723	3.11	396	2.67	485	2.70