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How Knowledge is Power: Education and the Sense of Control

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Using data from a 2005 nationally representative survey of working adults residing in the United States, we show that education is associated positively with a sense of personal control. The well-educated have higher status occupations which include higher levels of schedule control, challenging, interesting and enriching work, greater economic rewards and security, and a higher level of trust. Collectively, these patterns contribute substantially to the association between education and sense of control. We also observe that demanding work has a negative effect on sense of control, but this emerges only after adjusting for other higher status work conditions that correspond with demands. Our observations inform the integration of theoretical perspectives to describe education's benefits for personal and social functioning.

This paper seeks to extend a tradition of sociological inquiry that has explored the ways that social-structural arrangements influence the inner lives of individuals, from Marx's (1983[1852]) description of workers' estrangement in the organization of production to contemporary research that catalogues the links between occupational conditions and dimensions of personal and social functioning (Kohn 1976; Kohn and Schooler 1969; Seeman 1967). The sense of control is one of those dimensions. Objective social conditions shape experiences with successes and failures that, in turn, contribute to generalized expectancies about personal control. Thus, perceived control represents a cognitive link between objective, social conditions and inner experience (Mirowsky and Ross 2003a). Efforts that lead repeatedly to failure foster fatalism or external attributions, thereby potentially undermining active problem-solving behaviors. Alternatively, actions that yield success

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promote the attribution of outcomes to internal sources which fosters active problem-solving (Thoits 1994; Wheaton 1985).

Although most Americans tell survey researchers that they have a high sense of control, substantial social variation exists in the population (Mirowsky and Ross 2003a, 2003b). In particular, education emerges as one of the potentially important socioeconomic conditions that increase personal control (Ross and Sastry 1999). However, in his broad review of the psychosocial effects of education, Pallas (2000:519) has urged researchers to further explicate the social "factors that intervene" in the association between education and the sense of control. To address this gap, we examine the ways that occupation, work conditions, economic conditions and the sense of trust contribute to education-based patterns in the sense of control. We select these as focal explanations because of their connection to theoretical views of education as a source of inequality, human capital and social and economic resources.

People who report a high sense of control claim that, in general, they determine the positive and negative events and outcomes in their lives (Mirowsky and Ross 2003a). By contrast, individuals with a low sense of control cluster at the other end of the continuum, experiencing higher levels of powerlessness and the perception that chance, luck, fate or powerful others dictate the direction of their lives (Ross and Sastry 1999). The sense of control shares conceptual terrain with other constructs, including mastery, self-efficacy, internal locus of control, personal autonomy and instrumentalism (Rotter 1966; Seeman 1967; Wheaton 1985). Studies document that the sense of control is associated negatively with depression, anxiety, anger, poor self-rated health and impaired physical functioning (Mirowsky and Ross 2003a, 2003b). According to stress process theory, the sense of control is a resource that individuals draw upon to avoid or cope with stressors (Pearlin 1999). A high sense of control bolsters resilience to adversities, enabling individuals to learn and enact more flexible problem-solving methods (Thoits 1994). By extension, stressors often have less deleterious health consequences among people who possess a high sense of control. Thus, given the significance of the sense of personal control for individuals' health and well-being, it is essential to document and describe the social-structural arrangements that influence the possession of this critical personal resource.

Theoretical Framework

While the positive association between education and the sense of personal control is well-established, the effect appears to remain statistically significant *net* of ascribed statuses and work conditions (Ross and Wright 1998). We seek to build off of this prior research by accounting for a more

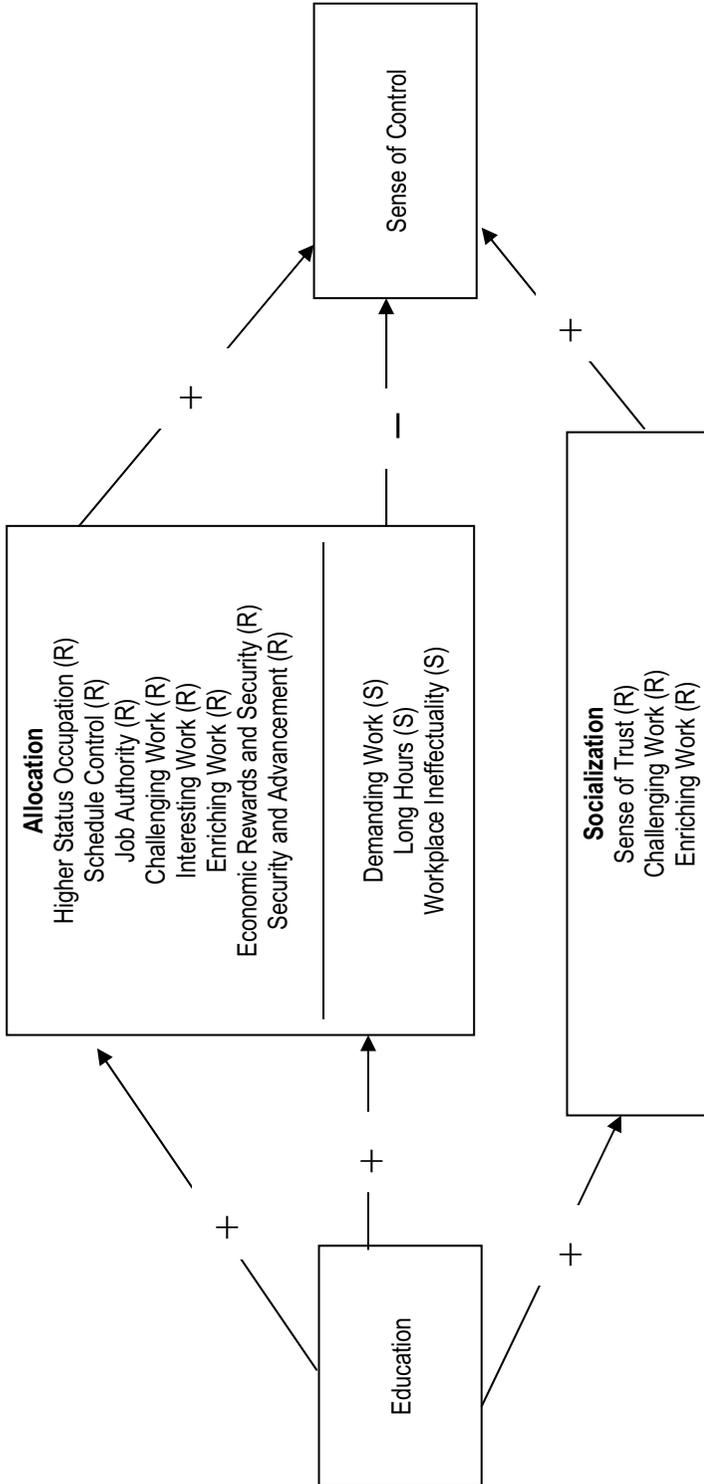
comprehensive set of potential explanatory conditions described below. Two theoretical views – allocation and socialization – provide a broad framework for understanding the mechanisms that link education and personal control (Bidwell 1989; Pallas 2000). Allocation theory identifies the ways that education provides access to higher status workplace positions and conditions (Kerckhoff 1976; Mirowsky and Ross 2003b). By contrast, socialization theory identifies the ways that education enhances personal attributes, psychosocial resources, and values (Pallas 2000); it builds off of Human Capital theory, which posits that educational rewards extend beyond pecuniary benefits to psychosocial outcomes (Becker 1993). In the sections that follow, we outline the ways that each of these views contributes to potential explanations for the association between education and the sense of personal control and the predictions of the resources vs. stress of higher status hypotheses; Figure 1 illustrates these proposed interrelationships.

The Allocation View of Education and the Implications for the Sense of Control

The allocation view underscores the ways that educational attainment sifts and sorts individuals into different occupational and economic conditions – and, in turn, these conditions tend to enhance a sense of personal control. According to Hunter (1988:753), “educational credentials are convenient markers for employers of the suitability of potential employees for jobs at different levels of autonomy, responsibility, or self-direction.” Education confers credentials that supplement the extrinsic rewards of better-paying work (Ross and Sastry 1999), and, for many, symbolize character traits that are highly valued in the labor market such as competence, potential, and persistence (Becker 1993; Spence 1974). Thus, gatekeepers in the occupational structure impute attributes to the well-educated that foster opportunities for accruing status (Collins 1979; Kingston, Hubbard, Lapp, Schroeder and Wilson 2003).

As a central source of status allocation, education differentially exposes individuals to occupational and workplace inequalities over the lifecourse (Pallas 2003; Ross and Wright 1998). The well-educated are more likely to participate in the labor force, have higher levels of occupational status, achieve higher levels of earnings and wealth, and experience a faster ascendancy through the occupational ranks (Grusky and DiPrete 1990; Kerckhoff, Raudenbush, and Glennie 2001; Sewell and Hauser 1975). In turn, individuals in professional occupations tend to enjoy greater schedule control, greater job authority, and more challenging, interesting, and enriching work (Kohn 1976; Kohn and Schooler 1982; Ross and Reskin 1992; Ross and Wright 1998; Schieman, Kurashina and Van Gundy 2006). Kohn and his colleagues have documented the effects of class variations

Figure 1. Conceptual and Theoretical Framework of the Association between Education and the Sense of Control



Note: R = Resource, S = Stressor

in these work conditions on personal and social values and orientations (Kohn 1976; Kohn and Schooler 1969, 1973, 1982; Miller, Schooler, Kohn and Miller 1979). One of their conclusions is that individuals of higher social class are more “self-directed” in work and nonwork domains.

In addition to occupation- and work-based inequalities, the allocative theory of education identifies the importance of economic conditions (Pallas 2003). While much is known about the economic rewards associated with education and high status jobs, the role of economic security remains unclear. The lack of economic security – or economic hardship – involves difficulties meeting basic needs of housing, clothing, food, transportation and medical expenses, and not having sufficient money left over at the end of the month. Economic hardship is one of the most pernicious stressors that can erode the sense of personal control (Mirowsky and Ross 2003a; Pudrovska, Schieman, Pearlin and Nguyen 2005), but the well-educated tend to have greater economic security (Mirowsky and Ross 2003b). Here, we seek to assess if greater economic security among the well-educated contributes to their higher levels of personal control.

Collectively, these ideas about the allocation-related benefits of educational attainment contribute to the *resources of higher status* hypothesis: Education is associated *positively* with the sense of personal control because the well-educated tend to have higher status occupations with greater schedule control, job authority, economic rewards and security, and opportunities for advancement. Moreover, the well-educated are often incumbents in challenging, interesting, and enriching work environments. As Figure 1 suggests, taking these conditions into account should explain why education is associated positively with the sense of control.

Thus far, we have outlined theoretical perspectives and empirical evidence about the benefits implied by the allocation view of education. However, we suspect that not all elements of the allocation view of education and its link to higher status work conditions are necessarily beneficial – there may be “costs” associated with higher status work. In particular, we argue that the well-educated are exposed to higher levels of some workplace conditions that function as stressors, such as demanding conditions, long hours and having to deal with workplace incompetence. In turn, these conditions may slightly offset the otherwise positive association between education and the sense of control. We refer to this class of effects as the *stress of higher status* hypothesis.

There is little doubt that higher status work conditions afford many personal, social and economic advantages. Yet, as Coser (1974) has observed, work is a “greedy institution” that extracts time, effort and attention from individuals – particularly workers in higher status positions (Hodson 2001). Paradoxically, then, several of the higher status occupation and work conditions that we have described as having a positive influence

on the sense of control (e.g., professional occupations, job authority, challenging work) are themselves associated with more demanding work conditions (Schieman et al. 2006). Not only do workers in professional jobs tend to have more job demands and work longer hours, but they are also more likely to feel “overworked.” (Jacobs and Gerson 2004) In addition to demanding contexts, problematic relationships are among the most central sources of stress for workers in higher status positions (Hodson 2001). Although work environments often provide supportive bonds that improve well-being and organizational commitment, the frequency of problematic relations makes the workplace one of the most interpersonally frustrating role contexts (Fitness 2000). Specifically, we argue that ineffectuality in the workplace – in which one’s fellow workers perform their duties in an incomplete manner – likely erodes the sense of control because it contributes to role ambiguity or overload (Pearlin 1999). Higher status jobs often involve greater accountability and involvement in organizational outcomes, so ineffectuality may be especially problematic for workers in higher status roles (Mirowsky and Ross 2003b).

In sum, the stress of higher status view implies that job demands, long hours and workplace ineffectuality may offset the benefits touted by the resources of higher status view. We formally test the *stress of higher status* hypothesis by asserting that the well-educated tend to have more job demands, work longer hours and have greater exposure to workplace ineffectuality. We also suspect that these conditions are associated with lower levels of the sense of control. By extension, statistical adjustments for these conditions should *suppress* the positive association between education and the sense of control. In the case of job demands, we have observed that demanding conditions contain both higher status *and* stressful elements that have counterbalancing effects on personal control. After these higher status elements of work are taken into account in our models, we suspect that job demands will be associated negatively with the sense of control. That is, adjusting for higher status aspects leaves elements of demanding work that may be related to role overload, ambiguity and uncertainty or unpredictability (Pearlin 1999).

The Socialization View of Education and the Implications for the Sense of Control

The socialization view of education posits that education shapes social values (Pallas 2000) and provides individuals with human capital (Becker 1993). Trust is a core social value and feature of social capital (Coleman 1988; Putnam 2000). Individuals with a generalized sense of trust believe that people tend to be fair, honest, and helpful – they have *faith in people* (Rosenberg 1956). At the other end of the continuum, “misanthropy”

involves the view of others as dishonest, unhelpful and selfish (Smith 1997). Applying the resources of higher status ideas, we propose that the sense of trust should contribute to the positive association between education and the sense of control if two patterns exist: (1. education is associated positively with the sense of trust; and (2. trust is associated positively with the sense of personal control (see Figure 1).

There is sound theoretical and empirical evidence to support the positive association between education and trust. From a socialization perspective, educational attainment is a critical step toward the experience of connections between one's own actions and outcomes (Ross and Sastry 1999; Wheaton 1985). In these processes, education contributes to a form of social instrumentalism in which one learns more effective communication skills; over time, these conditions foster deeper, enduring social orientations that favor trust over mistrust (Kohn and Schooler 1969; Mirowsky and Ross 2003b). This does not imply that the well-educated possess a naïve trust in *everyone*, irrespective of context, but rather that the psychosocial benefits of advanced schooling tend to enhance an effective set of socioemotional skills that help people solve interpersonal problems and challenges (Kingston et al. 2003; Pallas 2000). Moreover, the possession of a generalized sense of trust reduces the uncertainty and unpredictability about the actions of others, and reinforces the perception that others are dependable (Rotter 1980).

Mistrust of others reflects social isolation and a central source of alienation. In his conceptual specification of "locus of control," Rotter (1966:263) observed that "the alienated individual feels unable to control his own destiny." Alienating conditions can diminish one's sense of personal confidence and esteem (Jones, Couch and Scott 1997). Moreover, mistrust can fuel a sense of personal powerlessness and erode feelings of personal control (Seeman 1967). People who possess a sense of trust may be less controlling of others, and, ultimately, more effective at drawing upon a more diverse set of relations to create more supportive learning environments at work (Hodson 2001).

As Figure 1 illustrates, challenging and enriching work may reflect elements of both the allocation *and* socialization views of education. This proposition derives from the contention that challenging and enriching work environments are, by definition, work role conditions in which learning and personal development occur. According to Ross and Sastry (1999:377): "Education develops the ability to solve problems... and the ability to solve problems increase control over events and outcomes in life." As we described in the allocation view of education, the well-educated tend to find themselves in jobs with more challenging and enriching work. These conditions provide opportunities for individuals to learn the extent that their choices, efforts, and actions correspond with personal achievements

and failures (Mirowsky and Ross 2003b; Seeman 1967). In turn, they are more likely to encounter opportunities where they can deploy and develop socioemotional skills to manage and adapt to interpersonal problems and challenges (Pascarella and Terenzini 1991). Collectively, these ideas imply that any observed mediating effects of challenging and enriching work – in addition to reflecting allocation processes described above – also likely represent *socialization* processes.

Summary of Hypotheses

As illustrated in Figure 1, we expect to document a positive association between education and the sense of personal control and then explore potential reasons for it. The *resources of higher status* hypothesis proposes that the well-educated tend to have professional jobs with more schedule control, job authority, challenging and enriching work, job security and advancement opportunities, economic rewards, and financial security; moreover, the well-educated also tend to have a stronger generalized sense of trust. Collectively, these conditions are hypothesized to contribute to the positive association between education and the sense of control. By contrast, the *stress of higher status* hypothesis proposes that the well-educated are exposed to more job demands, longer hours and greater responsibility for dealing with workplace ineffectuality – these workplace conditions are known to erode the sense of personal control. By extension, then, we suspect that these conditions should offset slightly the otherwise positive association between education and the sense of control.

Methods

Sample

The data derive from the 2005 Work, Stress and Health survey that used telephone interviews with 1,800 adults in the 50 United States.¹ Eligible participants are 18 years of age or older and participating in the paid labor force. Interviews were conducted in English, so participants had to be sufficiently fluent in order to complete the interview. We successfully interviewed 70.8 percent of eligible respondents for the full sample. The age range of the sample is 18 to 94, with a mean of 43.511 (Std. Dev. = 13.205). The sample characteristics are similar to those of working adults in other national datasets such as the 2000 U.S. Census, the 2002 National Survey of the Changing Workforce, and the 2005 American Community Survey. Using the ACS data, we weighted analyses to achieve conformance with the United States population in terms of sex, age, race, marital status and occupation.

Focal Measures

Sense of Control

We use Mirowsky and Ross's (2003a) 2×2 index of the sense of personal control. It asks participants to report their level of agreement or disagreement with the eight statements; there are two statements in each of the four categories. Statements that measure the level that individuals claim control over good outcomes include: (1. "I am responsible for my own successes," and (2. "I can do just about anything I really set my mind to." Items that measure claims of control over bad outcomes include: (3. "My misfortunes are the result of mistakes I have made," and (4. "I am responsible for my failures." Items that assess the extent that individuals deny control over good outcomes are: (5. "The really good things that happen to me are mostly luck," and (6. "There's no sense planning a lot – if something good is going to happen it will." The last two statements measure the denial of control over bad outcomes: (7. "Most of my problems are due to bad breaks," and (8. "I have little control over the bad things that happen to me." Responses to statements 1 through 4 are coded "strongly disagree" (-2), "disagree" (-1), "neutral" (0), "agree" (1), and "strongly agree" (2). Responses to statements 5 through 8 are coded "strongly disagree" (-2), "disagree" (-1), "neutral" (0), "agree" (1), and "strongly agree" (2). We averaged responses; higher scores indicate a greater sense of control ($\alpha = .512$).² This index has been widely used in other studies (Mirowsky and Ross 2003a, 2003b).

Education

We asked participants, "What is the highest grade or year in school that you completed and got credit for?" Response choices are coded (0) "8th grade or less," (1) "some high school but did not graduate," (2) "high school graduate or GED," (3) "some college but no degree earned," (4) "Associate's Degree (2-year)," (5) "college graduate (BA or BS)," and (6) "post graduate-advanced degree (MA, Ph.D.)."

Occupation

To assess occupation, we asked participants about the job title of the "main job at which you worked last week." This refers to the main place of employment. We also asked about main duties in order to more accurately code responses. Using the open-ended information provided, we coded responses into five main categories in accordance with the Bureau of Labor Statistics codes. These include: "managerial and professional specialty occupations," "technical, sales, and administrative support occupations," "service occupations," "precision production, craft, and

repair occupations,” and “operators or laborers.” In regression analyses, we use the “managerial and professional specialty occupations” as the (omitted) contrast code.

Work Hours

We created a series of dummy codes for individuals working 40-49 hours per week, 50-59 hours per week, and 60 or more hours per week. In regression analyses we contrast these with the category of 39 or fewer work hours per week (the omitted category).

Schedule Control

One question asks participants about schedule control: “Who usually decides when you start and finish work each day at your main job? Is it someone else, or can you decide within certain limits, or are you entirely free to decide when you start and finish work?” We coded responses as “no schedule control” (0), “limited control” (1), and “full control” (2). In regression analyses, individuals with no schedule control are the omitted/contrast category.

Job Authority

Four items ask: (1. Do you supervise or manage anyone as part of your job? (2. Do any of those people supervise anyone else? (3. Do you influence or set the rate of pay received by others? (4. “Do you have the authority to hire or fire others?” We coded “no” responses as 0 and “yes” as 1. These questions are similar to those used by Elliott and Smith (2004). To create the index, we summed responses; higher scores indicating more job authority.

Challenging Work

To measure the level of challenging work, we asked participants: “How often do you have the chance to solve problems?” Response choices are “never” (1), “rarely” (2), “sometimes” (3), and “frequently” (4).

Interesting Work

One item assesses the level of interesting or stimulating work with the question: “How often does time feel like it is dragging at work?” Response choices are “never” (1), “rarely” (2), “sometimes” (3), and “frequently” (4). We reverse-coded the responses such that higher scores indicate more interesting or stimulating work.³

Enriching Work

We combined several items to create an “enriching work” index. The first item asks: “How often do you have the chance to learn new things?”

Response choices are “never” (1), “rarely” (2), “sometimes” (3), and “frequently” (4). We also asked participants about the level of learning opportunities with the following: “In the past 30 days, has anyone at work given you positive feedback, guidance, or advice?” If participants reported “yes,” then they were asked about the role-set source: “Was it a supervisor, someone you supervise, customer/client, coworker, or someone else at work?” Participants were able to choose multiple role-set sources and then describe the frequency that it occurred for each (1 = rarely, 2 = sometimes, and 3 = frequently). We coded individuals who reported no experience with this in the past 30 days as 0. To create the index, we standardized and averaged these items; higher scores indicate more enriching work.

Job Advancement

Participants were asked: “In the next 2 years, how likely are you to be promoted?” Response choices are “not at all likely” (0), “somewhat likely” (1), and “very likely” (2). Higher scores indicate more job advancement.

Job Security

One question asks participants: “In the next 2 years, how likely is it that you will lose your job or be laid off?” Response choices are “not at all likely” (0), “somewhat likely” (1), and “very likely” (2). We reverse coded this so that higher scores indicate more job security.

Job Mobility

Another item asks: “In the next 2 years, how likely is it that you will try to find a different job with another firm or organization?” Response choices are “not at all likely” (0), “somewhat likely” (1), and “very likely” (2). Higher scores indicate more job mobility.

Personal Income

Income is assessed with the question: “For the complete year of 2004, what was your total personal income, including income from all of your paid jobs, before taxes?” Given the highly skewed nature of the distribution, we logged income in the regression analyses.

Demanding Work

We asked participants about the level of demands in the workplace role-set with the following: “In the past 30 days, has anyone at work made too many demands on you?” If participants reported “yes,” then they were asked about the role-set source: “Was it a supervisor, someone you supervise, customer/client, coworker, or someone else at work?” Participants were able to choose multiple role-set sources and then describe the frequency

that it occurred for each (1 = rarely, 2 = sometimes, and 3 = frequently). We coded individuals who reported no experience with this problem as 0. In addition, we also asked: "How often do the demands of your job exceed those doable in an 8-hour workday?" Response choices are 1 = never, 2 = rarely, 3 = sometimes, and 4 = frequently. We standardized all of the items and then averaged them to create the demanding work index; higher scores indicate more demands.

Workplace Ineffectuality

We asked participants about the level of workplace ineffectuality with the following: "In the past 30 days, has anyone at work not done the work that needed to be done or done it in a sloppy or incompetent way." If participants reported "yes," then they were asked about the role-set source: "Was it a supervisor, someone you supervise, customer/client, coworker, or someone else at work?" Participants were able to choose multiple role-set sources and then describe the frequency that it occurred for each (1 = rarely, 2 = sometimes, and 3 = frequently). We coded individuals who reported no experience with this problem as 0. We then summed the items to create the workplace ineffectuality index.

Economic Security

Several items assess economic hardship: "During the last year, how often did you... have trouble paying the bills," "not have enough money to buy food, clothes, or other household goods," "not have enough money to pay for medical care." Response choices are "never" (1), "rarely" (2), "sometimes" (3), and "frequently" (4). A fourth item asks: "How do your finances usually work out by the end of the month? Do you have (1) "a lot of money left over," (2) "a little money left over," (3) "just enough to make ends meet," or (4) "not enough to make ends meet." We reverse-coded and averaged the four items to create the economic security index such that higher scores indicate more security (or less economic hardship) ($\alpha = .81$).

Trust

To assess levels of trust, we asked three commonly used questions that have appeared in the General Social Survey since 1972 (Rosenberg 1956; Smith 1997). The first asks: "In general, do you think most people would try to take advantage of you if they got the chance, or would they try to be fair?" Response choices are coded as "take advantage" (-1), "it depends/unsure" (0), and "try to be fair" (1). The second question asks: "In general, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Response choices are coded as "can't be too careful" (-1), "it depends/unsure" (0), and "trusted" (1). The third question asks: "In general, would you say that most of the time people

try to be helpful, or that they are mostly just looking out for themselves?" Response choices are coded as "mostly looking out for themselves" (-1), "it depends/unsure" (0), and "try to be helpful" (1). We averaged responses to the three items to create the trust index. Factor loadings for each item are greater than .74 and the reliability coefficient is .67 (the same level reported by Smith 1997).

Control Variables

Gender is coded 1 for women and 0 for men. For participants' race, we contrast "Non-Hispanic White," with "African-American," "Hispanic," "Asian" and "other." Age is measured in years. Marital status contrasts currently married with previously and never married. We included a measure of the number of children under the age of 18 residing in the household. Table 1 reports descriptive statistics for focal study variables.

Plan of Analyses and Links to Theoretical Framework

Using OLS regression techniques, we use progressive adjustments to explain the focal positive association between education and the sense of control (Mirowsky 1999). Our first model regresses the sense of control on education while adjusting for basic demographic variables. Then, we add occupation (Model 2), work conditions (Model 3), economic security (Model 4), and trust (Model 5). We include economic security and trust in separate steps to observe their mediating effects independently of occupation and work conditions. Broadly speaking, the inclusion of occupation, work, and economic conditions in models 2, 3 and 4 relate to the allocation theory views of the links between education and social-structural arrangements that, in turn, influence the sense of personal control. Although Model 5 more explicitly tests the socialization view, we wish to reiterate that the application of ideas from allocation and socialization theories and their links to the potential explanatory variables are not opposing or mutually exclusive sets of ideas. As we described above, some elements of higher status positions (i.e., challenging, enriching work) likely contain strands that represent ideas embedded in both theories. We apply these theories as a *general* framework to inform our ideas and explanations for the positive association between education and the sense of control.

Results

Figure 2 illustrates the unadjusted average levels of the sense of control across levels of education, revealing a positive and essentially linear association ($r = .21$, $p < .0001$). Model 1 of Table 2 confirms this pattern, net of ascribed statuses, marital status and children in the household. In Model 2, we observe that individuals in professional occupations report

Table 1: Summary Statistics for all Study Variables (N = 1,800)

Variable	Mean	SD	Min	Max
Sense of Control	.831	.452	-.75	2
Education	3.580	1.543	0	6
Professional	.296	—	0	1
Administrative	.351	—	0	1
Service	.183	—	0	1
Craft	.067	—	0	1
Labor	.103	—	0	1
Works 40-49 Hours/Week	.461	—	0	1
Works 50-59 Hours/Week	.148	—	0	1
Works 60+ Hours/Week	.122	—	0	1
Some Schedule Control	.312	—	0	1
Full Schedule Control	.219	—	0	1
Job Authority	.882	1.182	0	4
Challenging Work	3.501	.774	1	4
Interesting Work	2.554	1.049	1	4
Enriching Work	.000	.786	-1.845	1.503
Job Advancement	1.026	1.049	0	3
Job Security	1.763	.518	0	2
Job Mobility	.688	.830	0	2
Personal Income (Logged)	3.432	.831	.182	8.219
Demanding Work	.000	.801	-1.214	4.715
Workplace Ineffectuality	1.479	1.672	0	12
Economic Security	3.111	.748	1	4
Trust	.250	.724	-1	1
Women	.590	—	0	1
White	.739	—	0	1
Black	.152	—	0	1
Hispanic	.076	—	0	1
Asian	.025	—	0	1
Other Race	.027	—	0	1
Age	43.511	13.205	18	94
Married	.549	—	0	1
Children in Household	.798	1.028	0	3

a significantly higher level of personal control than each of the other occupation categories, although only the comparisons with administrative, service, and labor occupations reach statistically significant levels. The well-educated are more likely to hold professional occupations (see Figure 3); by extension, the inclusion of occupation reduces the education-based differences in personal control. These interrelationships contribute to the reduction in the size of education coefficient from .065 to .051 across models 1 and 2.

Table 2: Regression of the Sense of Control on Education, Occupation and Work Conditions, Economic Security and Trust

	Model 1	Model 2	Model 3	Model 4	Model 5
Education	.065*** (9.49)	.051*** (6.37)	.031*** (3.77)	.028*** (3.46)	.023*** (2.84)
Occupation					
Administrative ^a	—	-.059 [†] (- 2.09)	-.019 (- .66)	-.017 (- .61)	-.019 (- .68)
Service ^a	—	-.106** (- 3.04)	-.045 (- 1.27)	-.036 (- 1.03)	-.031 (- .88)
Craft ^a	—	-.056 (- 1.15)	-.032 (- .66)	-.024 (- .51)	-.018 (- .39)
Labor ^a	—	-.134*** (-3.19)	.067 (-1.57)	-.068 (-1.61)	-.062 (-1.47)
Work Conditions					
40-49 Hours/Week ^b	—	—	-.024 (-.94)	-.018 (-.71)	-.022 (-.84)
50-59 Hours/Week ^b	—	—	.015 (.41)	.022 (.63)	.016 (.45)
60+ Hours/Week ^b	—	—	.080 [†] (2.05)	.085 [†] (2.21)	.083 [†] (2.17)
Some Schedule Control ^c	—	—	.055 [†] (2.26)	.052 [†] (2.15)	.048 [†] (1.99)
Full Schedule Control ^c	—	—	.028 (.96)	.026 (.91)	.029 (1.03)
Job Authority	—	—	.002 (.17)	.002 (.20)	.000 (.05)
Challenging Work	—	—	.051*** (3.42)	.049*** (3.32)	.047*** (3.22)
Interesting Work	—	—	.035*** (3.28)	.032** (3.06)	.030** (2.85)
Enriching Work	—	—	.056*** (3.90)	.053*** (3.73)	.048*** (3.38)
Job Advancement	—	—	.016 (1.59)	.019 (1.88)	.021 [†] (2.02)
Job Security	—	—	.027 (1.37)	.021 (1.07)	.017 (.88)
Job Mobility	—	—	.029 [†] (2.13)	.034 [†] (2.45)	.036** (2.60)
Personal Income	—	—	.048** (3.09)	.035 [†] (2.18)	.039 [†] (2.45)
Demanding Work	—	—	-.046*** (- 3.28)	-.042** (- 2.97)	-.037** (- 2.64)
Workplace Ineffectuality	—	—	.016** (2.50)	.018** (2.74)	.021*** (3.24)
Economic Security	—	—	—	.056*** (3.63)	.045** (2.93)
Trust	—	—	—	—	.074*** (4.82)

Continued on the following page.

Table 2 *continued*

	Model 1	Model 2	Model 3	Model 4	Model 5
Control Variables					
Women	-.074*** (- 3.39)	-.086*** (- 3.73)	-.050 [†] (- 2.11)	-.042 (- 1.76)	-.039 (- 1.67)
Black ^d	-.016 (-.52)	-.012 (-.39)	.003 (.09)	.008 (.26)	.039 (1.24)
Hispanic ^d	-.114** (- 2.87)	-.111** (- 2.78)	-.103** (- 2.65)	-.097 [†] (- 2.49)	-.075 (- 1.94)
Asian ^d	-.241*** (- 3.63)	-.246*** (- 3.71)	-.242*** (- 3.74)	-.246*** (- 3.82)	-.239*** (- 3.72)
Other ^d	-.070 (- 1.07)	-.081 (- 1.24)	-.063 (-.98)	-.065 (- 1.03)	-.054 (-.85)
Age	-.004*** (- 4.64)	-.004*** (- 4.83)	-.005*** (- 4.81)	-.005*** (- 4.78)	-.005*** (- 5.31)
Children in Household	.027 [†] (2.43)	.026 [†] (2.38)	.022 [†] (2.04)	.027 [†] (2.46)	.027 [†] (2.47)
Previously Married ^e	-.043 (- 1.51)	-.040 (- 1.40)	-.034 (- 1.21)	-.021 (-.74)	-.021 (-.75)
Never Married ^e	-.072 [†] (- 2.55)	-.066 [†] (- 2.34)	-.053 (- 1.91)	-.053 (- 1.91)	-.060 [†] (- 2.15)
Constant	.864	.992	.445	.322	.371
R ²	.083	.090	.148	.154	.165

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

^a Compared to the “professional occupation” category.

^b Compared to the “work less than 40 hours/week” category.

^c Compared to the “no schedule control” category.

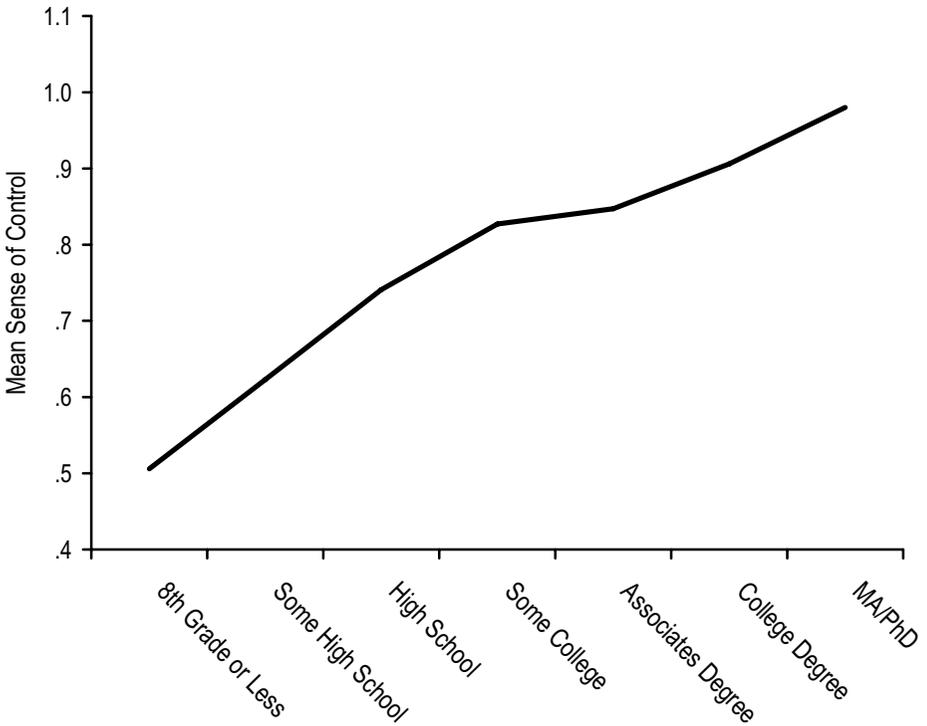
^d Compared to non-Hispanic whites.

^e Compared to married.

Notes: Unstandardized regression coefficients are shown in the table, with t-statistics in parentheses. N = 1,800.

In Model 3, compared to those with no schedule control, individuals with some schedule control report a higher average level of personal control; those with full schedule control, however, are not statistically different than workers with no control over their own schedules. In addition, the following work characteristics are associated positively with the sense of control: challenging, interesting and enriching work, job mobility, and higher-paid work. Moreover, with the exception of job mobility, these work conditions contribute to the positive education-control association because education is associated positively with each of these work conditions (see Table 3). By extension, adjustments for these conditions reduce the education coefficient from .051 to .031 across models 2 and 3. It is noteworthy that professionals have higher levels of schedule control, challenging and interesting work, and higher pay (see Table 4). Once we take these occupation-based differences into account, the inclusion of work conditions

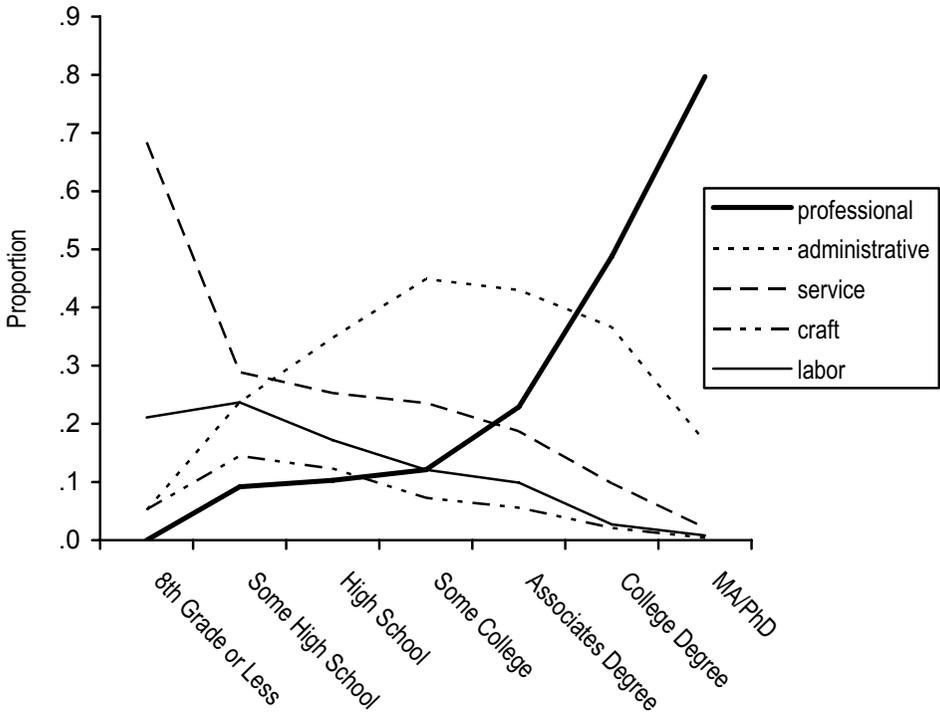
Figure 2. Education and the Sense of Control



fully contributes to professionals' higher sense of control relative to other occupations (comparing models 2 and 3). It is also worth mentioning that job authority appears to be unrelated to the sense of control. In separate analyses (not shown) we found that job authority's positive association with the sense of control occurs indirectly because those with authority tend to have higher levels of challenging, interesting, and engaging work. After taking these interrelationships into account, we find a non-significant association between job authority and personal control.

Our findings about the effects of long work hours, demanding work and workplace ineffectuality are a bit more complicated. First, in Model 3, we observe that individuals who work long hours (60 or more per week) report a significantly *higher* level of the sense of control compared to those who work fewer than 40 hours per week. Therefore, long work hours cannot function as a suppression effect, as we had originally hypothesized. Likewise, we observe that demanding work is associated *negatively* with the sense of control. Additional analyses (not shown) that excludes the other work conditions shown in Model 3 indicate that the coefficient for

Figure 3. Education and Occupation



demanding work is not significant ($b = -.016, p = .219$). However, when we include job demands along with other work conditions in Model 3 that are associated positively with the sense of control *and* demands, the size of its coefficient increases (in the negative direction) and becomes statistically significant at the .001 level. Several patterns contribute to this suppression effect. As hypothesized, once we adjust for the positive correlates of demanding work, especially job authority, schedule control, challenging work, enriching work and better pay (see Table 3), the elements of demanding work which remain are those believed to be associated negatively with the sense of control. This finding is important because education and many of the other higher status work conditions are associated *positively* with demanding work. Moreover, we observe an unexpected *positive* association between workplace ineffectuality and the sense of personal control. Workplace ineffectuality has a net positive association with control because of its negative correlation with schedule control and interesting work. However, workplace ineffectuality is unable to contribute to or suppress the positive association between education and the sense of control because it is unrelated to education.

Table 3: Correlations among Sense of Control, Education and Work Conditions

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Sense of Control	1.00													
2. Education	.21	1.00												
3. Works 60+/Week	.10	.02	1.00											
4. Some Schedule Control	.11	.17	-.02	1.00										
5. Full Schedule Control	.05	.07	.13	-.36	1.00									
6. Job Authority	.11	.10	.19	.04	.26	1.00								
7. Challenging Work	.21	.25	.10	.12	.10	.25	1.00							
8. Interesting Work	.14	.21	.09	.07	.18	.17	.18	1.00						
9. Enriching Work	.19	.19	.02	.10	.01	.11	.36	.23	1.00					
10. Job Advancement	.07	-.03	.06	-.06	.27	.13	.08	.06	.13	1.00				
11. Job Security	.06	.03	.00	.01	.04	.04	.09	.12	.09	.04	1.00			
12. Job Mobility	-.00	-.02	-.09	.05	-.10	-.11	-.13	-.23	-.19	-.01	-.21	1.00		
13. Personal Income	.18	.38	.23	.12	.11	.31	.25	.19	.11	-.08	.06	-.21	1.00	
14. Demanding Work	.02	.09	.15	.09	-.02	.20	.18	.05	.10	-.08	-.03	.01	.21	1.00
15. Workplace Ineffectuality	.06	.01	.02	.02	-.10	.11	.08	-.12	-.01	-.09	-.04	.14	.07	.32

Note: All coefficients above .05 are statistically significant at the .05 level.

In Model 4 we observe that economic security is associated positively with the sense of control. As Figure 4 illustrates, levels of economic security are at their highest among the well-educated ($r = .27, p < .001$). By extension, the adjustment for economic security further contributes

to education-based differences in average levels of the sense of control. In addition, Model 5 shows that trust is associated positively with personal control. Moreover, as Figure 4 demonstrates, the well-educated report higher levels of trust than their peers with fewer years of education ($r = .25, p < .001$). Thus, the inclusion of trust further contributes to the positive education-control association, although the education coefficient remains statistically significant.

In sum, a comparison of models 1 through 5 across our progressive adjustments for focal explanatory conditions indicates that people with more education tend to possess higher levels of the sense of control because they cluster in professional occupations with more schedule control, challenging, interesting and enriching work, and better pay. They also report greater economic security and more trust in others. Collectively, these conditions contribute to the positive association between education and the sense of control.⁴ These patterns are more consistent with the resources of higher status hypothesis; only our observations for demanding work are suggestive of stress of higher status hypothesis predictions, although that support is quite weak.

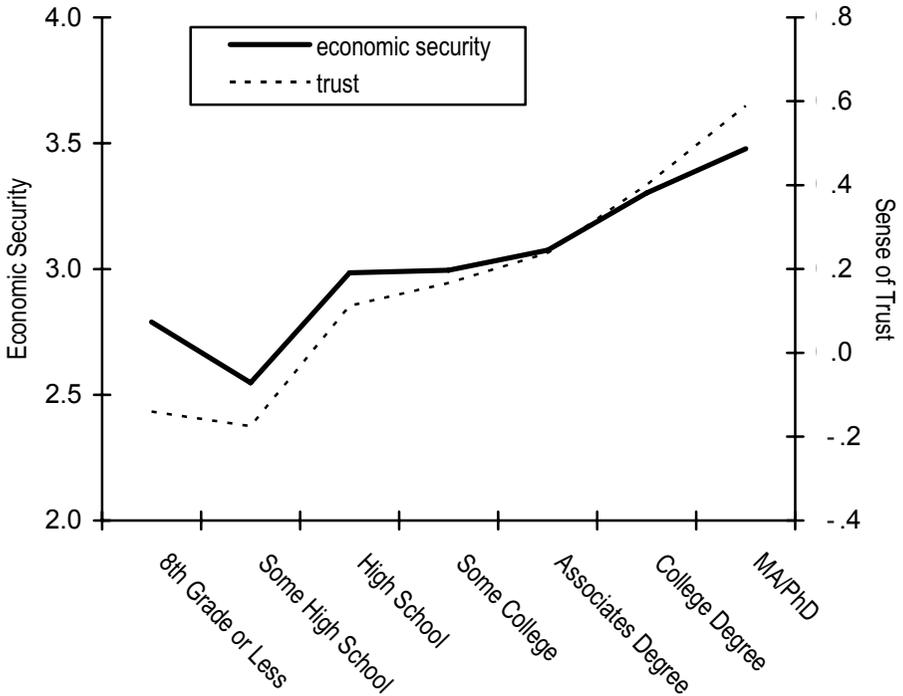
Several other peripheral findings deserve brief mention. Women

Table 4: Differences in Selected Work Conditions across Occupations

Variables	Professional (n = 533)	Administrative (n = 632)	Service (n = 329)	Craft (n = 121)	Labor (n = 185)
Some Schedule Control	.392	.337	.207*	.256	.216*
Full Schedule Control	.302	.176*	.173*	.256	.184*
Job Authority	1.291	.672*	.708*	1.091	.589*
Challenging Work	3.769	3.438*	3.288*	3.611	3.245*
Interesting Work	2.883	2.463	2.392*	2.388*	2.311*
Enriching Work	.194	.002*	-.180*	.077	-.297*
Demanding Work	.168	-.053*	-.136*	-.020	-.047*
Personal Income (Logged)	3.811	3.356*	2.979*	3.519*	3.346*

* Mean comparison with the "professional" occupation is statistically significant at $p < .05$.

Figure 4. Average Levels of Economic Security and the Sense of Trust by Education



report a lower sense of control than men mainly because they tend to have jobs with lower levels of job authority, schedule control and earnings. Black participants report a higher level of control than whites *after* we adjust for their lower status work conditions, lower level of economic security and lower trust; these conditions suppress the black-white differences (but not significantly). By contrast, Hispanic participants' lower level of control is explained by their lower status work conditions, lower levels of economic security, and lower levels of the sense of trust. On average, Asian-Americans report lower levels of control than whites net of other conditions.⁵ We also observed that age is associated negatively with control and the never married report lower levels of control than the married. Collectively, these patterns are *generally* consistent with the findings of prior studies (Mirowsky and Ross 2003a; Ross and Sastry 1999).

Discussion

In a national 2005 survey of workers in the United States, we observe that education is associated positively with the sense of personal control. What explains this association? Allocation theory posits that education shapes

attainment in higher status occupational and material conditions over the lifecourse, which, in turn, contributes to the education-control relationship. Our findings concur with these tenets in several ways: (1. the well-educated tend to have higher status occupations; 2. the well-educated tend to be incumbents in work roles with higher levels of schedule control, challenging, interesting and enriching work, and better pay; and (3. these conditions are associated with higher levels of the sense of control. By adjusting for these patterns we *partially* explain the positive association between education and the sense of control. Collectively, these interrelationships represent support for the resources of higher status hypothesis. Moreover, some of these education-linked work conditions mediate the influence of other work conditions, further reinforcing allocation theory's proposition of the status benefits of education. For example, professionals tend to have higher levels of schedule control, challenging, interesting and enriching work, and better pay; those conditions fully account for the occupation-based differences in the sense of control. Likewise, structural-organizational features such as authority are associated positively with the sense of control indirectly through their positive associations with other high status conditions. In these ways, our observations reinforce and extend previous studies (Ross 2000; Ross and Wright 1998; Schieman 2002).

In addition, our findings underscore the explanatory value of both allocative and socialization views of education. For example, job authority and schedule control are structural-organizational conditions that offer status, power and resources for the well-educated. In this respect, they represent allocative elements of education. Although some work conditions – especially challenging, interesting and enriching job environments – are clearly related to the allocative elements of education, they also contain “human capital” facets that connect with socialization views about education's psychosocial benefits. Human capital theory implies that the well-educated should report higher levels of these conditions. Creative, problem-solving, and decision-making dimensions of higher status work that present individuals with opportunities to learn and develop are associated with allocative and socialization processes.

We also tested an alternative view in the stress of higher status hypothesis. Broadly speaking, we suspected that some work conditions – demanding work, long hours, and workplace ineffectuality – might suppress the education-control association if they represented role-related stressors. However, we found little evidence to support the stress of higher status hypothesis for several reasons. Contrary to our predictions, working long hours and workplace ineffectuality are *unrelated* to education and are associated *positively* with the sense of control; therefore, neither influences the education-control association. In the case of demanding work, several noteworthy patterns emerged.

We found that the well-educated report more demanding work, but this is *unrelated* to the sense of control in bivariate analyses. In multivariate models, however, demanding work is associated *negatively* with the sense of control because people in demanding jobs also tend to enjoy many of the conditions that are associated with higher levels of personal control, especially job authority, schedule control, and challenging, interesting and enriching work. After we adjust for these higher status elements of demanding work, the remaining effect on the sense of personal control is negative. This previously-undocumented suppression effect illustrates the complexity of demanding work and its potential to off-set the resources of higher status. In addition, we observed that demands are associated positively with workplace ineffectuality. Yet, even after adjusting for these conditions, demands have a net negative effect on the sense of control. Collectively, these findings raise important questions about the allocative view because education is associated positively with demanding work, but demands have *net* negative implications for personal control. One hypothesis for future research is that after we account for the higher status elements of demanding work the remaining negative influence reflects stress associated with role ambiguity (Pearlin 1999) or the “increased risk of being held responsible for things outside one’s control.” (Kohn and Schooler 1973:109)

Net of the allocative processes described above, we observed that education-based differences in control remain; here, the socialization view of education helps to explain the outstanding association. Specifically, we found that the sense of trust mediates the education-control association, providing additional evidence of the socialization benefits of education. The sense of trust reflects another personal resource that parallels control as an important cognition (Mirowsky and Ross 2003a; Wheaton 1985), and an element of social capital that fosters feelings of predictability in relationships (Coleman 1988; Putnam 2000). Socialization theory posits that education fosters human and social capital, especially with respect to attitudes, values, and orientations. That we observe the sense of trust’s effects *net* of education, occupation, and work conditions reinforces the socialization view: Education instills the capacity to understand social complexities and maintain trust whatever the conditions of peoples’ lives (Kingston et al. 2003). Here, our findings are also consistent with evidence of more tolerant attitudes among the well-educated (Bobo and Licari 1989; Hyman and Wright 1979).

Our main rationale for identifying trust as a focal explanatory measure in our conceptual model is to simply underscore that the well-educated have higher levels of both trust and personal control; in turn, these interlocking patterns help explain the focal association between education and personal control. Yet, these findings require caution because the causal

ordering of the trust-control relationship is likely the most problematic among the focal associations. We adjust for the sense of trust solely to establish whether or not it contributes to education's positive association with the sense of control. We acknowledge the criticism that some of the association occurs in the reverse direction: that is, education increases the sense of control which, in turn, increases a sense of trust. In cross-sectional analyses, this remains an unresolved claim. Yet, the theory of personal control implies that some portion of the effect likely flows from the sense of feeling powerless (low control) to the sense that others cannot be trusted (Mirowsky and Ross 2003a). As additional waves of data become available to us, we will be able to more accurately estimate the interrelationships between trust and the sense of personal control over time. This is an understudied and important venue for sociological analyses in its own right. One potential direction involves the meaning of trust and its link to other personality factors, such as conscientiousness, which may contribute to the link between trust and personal control.

Several other limitations of the present study deserve mention. First, the cross-sectional design of the survey makes it difficult to disentangle the causal ordering. However, it is important to underscore that our aim was to establish the association between education and the sense of control and then statistically adjust for conditions that theory predicts are potential explanations. Although we are not claiming that changes in education yield changes in levels of the sense of control, prior evidence and theory suggests that most of the influence occurs from education to control (Mirowsky and Ross 2003b). By contrast, the causal ordering of many of our focal work conditions in the processes described here remain unclear. Again, we reiterate that our aim is to determine the *net effects* of education after statistically adjusting for education-based differences in occupation, work conditions, economic conditions and the sense of trust.

Another limitation is that we do not take into account antecedent factors, such as parents' SES or other early lifecourse experiences. Because personal control in adolescence is associated with educational attainment and personal control in adulthood, our failure to assess the personal control in adolescence may cause us to overstate the net association between education and adult personal control. In addition, as a proxy for early socioeconomic disadvantage, we included in separate analyses a measure that asks "Thinking back to the time while you were growing up – until you were age 18, how difficult was it for your family to meet basic household needs?" While not the best measure of early socioeconomic experience, it is solid indicator of recollections about early hardship. Early economic hardship correlates highly with later hardship across the lifecourse, as well as other aspects of educational attainment,

occupational experience, and work conditions (Pudrovska et al. 2005). Our analyses revealed that there is no additional explanatory benefit of including this proxy measure for early economic hardship (full analyses are available upon request).

A third caveat involves the limited information contained in our measure of education. We do not have information about the years of formal education, academic major, the prestige of the university, or lifecourse patterns in educational attainment. Some individuals may have obtained additional schooling later in life to achieve higher status work conditions; some workplaces may encourage and subsidize additional schooling. The sense of control may also influence selection into and out of education. Despite these limitations, we document and describe a positive association between education and control. Next steps for research include efforts to understand the extent to which variations in the nature and form of education, as well as the effects of discrepancies between educational attainment and occupational achievements and expectations over the lifecourse, influences the sense of control.

Conclusion

Education is a source of status inequality and human capital. It yields resources that bolster the sense of control, but it can also generate stressors of higher status that erode feelings of control. Our study contributes to the literature on the psychosocial benefits of education in several ways. First and foremost, we have presented results from a recent nationally representative survey of working adults that has allowed us to replicate and extend the findings of prior research based on different data sets. More importantly, we have been able to underscore the ways that education seems to yield achievements in occupation and work life. Unlike prior research, we have more explicitly traced education's theoretical and empirical links to allocation and socialization processes that, in turn, help explain the positive association between education and the sense of personal control. Specifically, the well-educated tend to have higher status occupations and are often in work roles with higher levels of schedule control, challenging, interesting and enriching work, and better pay. Given that these conditions are related positively to the sense of control, the adjustment for these patterns partially accounts for education's positive link to personal control.

Finally, our observations extend theoretical views about the relevance of education *and* personal control by describing the ways that education connects primarily to the resources of higher status occupational and work conditions. The fact that professionals tend to enjoy more schedule control and challenging, interesting, and enriching work fully contributes

to occupation-based differences in personal control. And yet, we find that education-based differences in control remain net of our adjustments for the conditions identified as components of allocative processes. To further help explain why education increases a sense of personal control, we identify the socialization benefits of education by discovering that the sense of trust mediates the education-control association. Collectively, our efforts continue a long-standing sociological interest in the ways that objective social conditions influence actors' sense of their own agency in the important events, outcomes and directions of their lives, and the specific ways that education is likely to represent a fundamental component in these processes (Pallas 2000).

Notes

1. To obtain the sample, we used a list-assisted random digit dialing selection drawn proportionally from all 50 states from GENESYS Sampling Systems. The sampling approach employed the List +1 method, which tends to yield a higher proportion of productive numbers (Lepkowski 1988). List-assisted RDD is widely accepted now by most social survey research organizations as a cost-effective alternative to the pure RDD methods originally developed by Waksberg (1978). List-assisted RDD increases the probability of encountering residential numbers while minimizing the biases often associated with non-traditional RDD techniques.

For our study, GENESYS generated a sample from 50 states that was drawn in proportion to the distribution of households. The total sample was based on: (1. telephone numbers associated with residential households; (2. households agreeing to answer the screening questions; (3. successfully screened households that have one or more adult members who are currently working; and (4. eligible households with a subsampled adult who agreed to participate in the interview.

2. Mirowsky and Ross observe alpha reliabilities for their SOC index of .68 (2003a) and .574 (1990); ours is slightly lower (.51). Is lower reliability problematic? According to Ross and Mirowsky (1992:221), "the index is used as a dependent variable in the analyses; therefore, random measurement error makes the tests of significance conservative (less power) but does not bias the regression coefficients" (also see Bohrnstedt and Carter 1971; Mirowsky and Ross 1991, 1996). Although lower reliability slightly degrades t-values, our analyses yield results that are not borderline. The most likely reason for the lower alpha in our survey is reduced variance in personal control because of the inclusion of employed individuals only. Alphas are essentially estimates of the proportion of variance in the measure explained by the latent factor producing the correlations among the responses. Reducing the factor variance reduces the explained variance but not the random variance. That changes the ratio and reduces the reliability estimates. Sample restrictions leave the unstandardized factor loadings unchanged while reducing the r-squares for subscales or individual items. Mirowsky and Ross's (2003a) survey is a representative survey of all Americans – employed and non-employed – and they *oversample* adults 65 and older. These sample properties increase

variance in the SOC measure because the unemployed have lower SOC than the employed (Ross and Mirowsky 1992) and average levels of SOC decrease at an accelerating rate among adults older than age 55 (Mirowsky 1995). Recognizing reliability concerns, Wolinsky and colleagues (2004:730) examined the short-term stability of the SOC index with test-retest interviews one to four days after interviews from a longitudinal study. They observed moderate to high item-level agreement; high agreement was also observed at the scale score level. They concluded that the SOC index has “substantial reproducibility” and “acceptable stability” for cross-sectional studies.

3. Recognizing the limitations of single-item measures, we considered combining challenging, interesting, and enriching work items into indices in several ways. For example, if we combined these into one index (factor loadings range from .50 to .73), that index is associated positively with personal control but explains less variance than individual items and neglects the *independent effects* of items. We tried other combinations of items, but none yielded better estimates than analyses based on the individual items (also see Ross and Wright 1998).
4. Tests for mediating effects indicate that schedule control, challenging work, interesting work, enriching work, income, economic security and trust contribute significantly to the reductions in the education coefficients; challenging work, economic security, and trust have the overall largest net mediating effects (Preacher and Leonardelli 2001; Sobel 1982).
5. We also test for gender- and race-contingent effects of education and work conditions on the sense of control. The education-based patterns observed on Model 1 of Table 4 are generally similar by gender and race (analyses available upon request). For race, we had to analyze whites vs. a category that combined all other groups because of small race-by-education cell sizes.

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