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BRIEF REPORT

Parental Educational Attainment and Sense of Control in Mid- and Late-Adulthood

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Sense of control is greater among children who grow up in households of higher socioeconomic status. It is unclear if this childhood advantage persists throughout life or if schooling and adulthood experiences override any early childhood advantage. Using data from 2 nationally representative samples of primarily middle-aged (National Survey of Midlife Development in the United States, or MIDUS), and older adults (Health and Retirement Study, or HRS), I tested if personal mastery and perceived constraints in adulthood were associated with the educational attainment of the participant's father or mother, adjusting for participant's education level, income, and other demographic characteristics. In both samples, personal mastery was not associated with either parent's education level, but perceived constraints had a graded inverse association with mother's education level. These results indicate that childhood experiences continue to be associated with perceived constraints, even in later life, and may not be completely overridden by adult experiences.

Keywords: sense of control, mastery, parental education, childhood socioeconomic position

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Sense of control represents one's belief in whether events in life are determined by one's own actions, as opposed to chance, fate, or the actions of others (Skinner, 1996). Sense of control is conceptualized as a learned expectancy (Lefcourt, 1982). Consistent accomplishment of goals in response to effort can increase sense of control, while inconsistency between actions and outcomes can decrease sense of control. Sense of control beliefs have important roles in physical and mental well-being, educational attainment, and job performance (Rodin, Timko, & Harris, 1985; Wang, Kick, Fraser, & Burns, 1999).

Two dimensions of sense of control have been recognized: contingency and competence (Skinner, 1996). Contingency refers to the belief that means exist to influence an outcome. Competence refers to one's belief that he or she can access these means. These dimensions have been operationalized in measures of perceived constraints and personal mastery (Lachman & Weaver, 1998a, 1998b). While some investigators have combined these measures into a single scale or focused solely on competence, considering control and helplessness as ends of a continuum (Mirowsky & Ross, 2007; Pudrovska, Schieman, Pearlin, & Nguyen, 2005), mastery and perceived constraints may have differing and independent associations with outcomes (Lachman & Weaver, 1998b).

Correlates of Sense of Control in Adulthood

Sense of control tends to increase through young adulthood, plateau in middle-age, and possibly wane in old age (Bailis, Segall, Mahon, Chipperfield, & Dunn, 2001; Lewis, Ross, & Mirowsky, 1999; Mirowsky and Ross, 2007; Pearlin, Nguyen, Schieman, & Milkie, 2007; Schieman, 2001). Sense of control is greater among persons with higher educational attainment (Bailis et al, 2001; Bruce & Thornton, 2004; Mirowsky, 1995; Pearlin et al. 2007; Pudrovska et al., 2005; Schieman, 2001). More education also predicts a more rapid increase in sense of control during young adulthood and attenuates decreases among older individuals (Lewis et al, 1999; Mirowsky & Ross, 2007; Schieman, 2001). Other demographic factors have less consistent associations. Men had a greater sense of control in a study of young adults, but not in older adults (Lewis et al., 1999; Pearlin et al., 2007). Blacks reported lower sense of control than Whites in some studies (Bruce & Thornton, 2004; Lewis et al., 1999; Mirowsky, 1995; Schieman, 2001), but not in others (Pearlin et al., 2007). Married persons tend to report greater sense of control (Bruce & Thornton, 2004; Schieman, 2001). In addition, adults with poor health have lower sense of control than those in good health, possibly because of the activity limitations imposed by chronic health conditions (Bailis et al., 2001; Lachman & Weaver, 1998b; Mirowsky, 1995; Pudrovska et al., 2005).

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Development of Sense of Control in Childhood

Sense of control develops during childhood as part of the concept of self (Flammer, 1995). Because sense of control is evident at a young age, most research on its development has focused on parents' behavior, particularly parenting style (Carton & Nowicki, 1994; Lefcourt, 1982). Greater sense of control is fostered by parenting styles that emphasize nurturance, encouragement of autonomy, and consistency in discipline (Carton & Nowicki, 1994; Flouri, 2006; Flouri & Hawkes, 2008; Kohn & Schooler, 1983; Whitbeck et al., 1997). These parenting styles are more common among parents of higher socioeconomic status (SES; Kohn & Schooler, 1983; Whitbeck et al., 1997). In turn, children of parents with high SES have a greater sense of control (Flouri & Hawkes, 2008; Lefcourt, 1982; Lewis, Ross, & Mirowsky, 1999). Greater expectations for school achievement and observation of how their parents manage challenges may also contribute to SES-associated differences in children's sense of control (Schneewind, 1995; Wang et al., 1999; Whitbeck et al., 1997).

Persistence of Childhood Influences in Adulthood

The strong association between parental SES and sense of control during childhood and adolescence raises the question of whether the influence of parental SES persists throughout life. Experiences of growing up in a higher SES household might lead to a greater sense of control, which is then reinforced by higher educational attainment and accomplishment of increasingly challenging goals. By this process, adults who grew up in higher SES households may have a greater sense of control than those who did not, even accounting for personal educational attainment. Alternatively, personal educational attainment may eclipse, or adverse experiences may attenuate, any early advantage provided by growing up in a higher SES household.

Few studies have examined whether sense of control in adulthood is associated with childhood SES, beyond its association with adult SES. Childhood socioeconomic position is most often measured by parental educational attainment or the father's occupation, as markers of the family's wage-earning potential. Parental educational attainment is a reliable measure of childhood socioeconomic position (Krieger, Okatmoto, & Selby, 1998). In the 1970 British Birth Cohort, there was no association between mastery at age 30 and parental social class, poverty, or mother's education level, after accounting for participant's education level (Flouri & Hawkes, 2008). In contrast, individuals whose fathers had unskilled jobs were twice as likely as those whose fathers had a professional occupation to have an external locus of control in a survey in the Netherlands (Bosma, Schrijvers, & Mackenbach, 1999). Among young U.S. adults, sense of control was positively correlated with parental education level, although the only indicator of participants' SES in this analysis was completion of high school (Lewis et al, 1999). Lastly, sense of control was higher among adults whose parents were more highly educated, but only among those younger than age 45 (Mirowsky & Ross, 2007).

In the latter two studies, sense of control was examined as a unidimensional construct, and so investigators could not distinguish if competency beliefs were more strongly associated with parental SES than contingency beliefs. These studies also did not adjust for income (Mirowsky & Ross, 2007) or health (Lewis et al., 1999; Mirowsky & Ross, 2007), both important correlates of sense of control in adulthood. Additionally, these studies examined mean parental education. Although parental education levels tend to be highly correlated, and although both paternal and maternal education levels are used as measures of childhood SES, parental roles differ. Identifying differing associations with the father's and the mother's education levels would provide insight into how childhood SES might influence the development of sense of control. Strong associations with the father's education level or with both parents' education level would favor a material or structural origin, while isolated associations with the mother's education level might suggest an important role for instructional or interpersonal origins.

This study investigated if parental education level was associated with sense of control in adults, net of adult SES. I sought to extend current knowledge in this area in three ways: (a) to test associations across adulthood using two nationally-representative samples, one of primarily middle-aged adults and one of primarily older individuals; (b) to separately test associations with personal mastery and perceived constraints; and (c) to separately test associations with mother's and father's education levels.

Method

Data Sources and Samples

Data from two surveys were used: the National Survey of Midlife Development in the United Status (MIDUS) and the Health and Retirement Study (HRS).

MIDUS. MIDUS was a survey of well-being, attitudes, and social roles of adults in midlife, conducted in 1995–1996 (Brim et al., 2010). Participants were recruited by random-digit dialing of households to provide a nationally-representative sample of noninstitutionalized English-speaking adults ages 25–74. Participants completed a telephone interview (response rate 70%) and a mailed self-administered questionnaire (response rate 87%), which included scales on personal mastery and perceived constraints. Of 3,032 participants, we excluded 37 because of missing data, which left a sample of 2,995 participants.

HRS. The HRS is an ongoing panel study of the social, economic, and health characteristics of older Americans, comprised of a nationally representative sample of noninstitutionalized adults older than age 50. HRS is sponsored by the National Institute on Aging (Grant NIA U01AG009740) and conducted by the University of Michigan (St. Clair et al., 2009). In 2006, a subsample completed an extended evaluation that included a self-administered questionnaire on personal mastery and perceived constraints (response rate 82%). Of 6,928 nonproxy respondents, we excluded 61 who did not complete the questionnaire, for a sample of 6,867 participants.

Sense of Control Measures

MIDUS. The questionnaire included the personal mastery and perceived constraints scales from the Midlife Developmental Inventory (Lachman & Weaver, 1998b). Personal mastery was measured by four Likert-scaled statements, and perceived constraints were assessed by eight statements. Scores were the mean of responses (possible range 1–7), with higher scores indicating

more mastery or perceived constraints. The coefficient alpha of reliability was .70 for personal mastery and .86 for perceived constraints (Lachman & Weaver, 1998b).

HRS. This survey also included measures of personal mastery and perceived constraints based on the Midlife Developmental Inventory (Lachman & Weaver, 1998b). The personal mastery scale had the four items used in MIDUS, along with the item "I can do the things I want to do." The perceived constraints scale had five items used in MIDUS. Scores were the mean of responses (possible range 1–6), with higher scores indicating more mastery or perceived constraints. The coefficient alpha of reliability was .89 for personal mastery and .86 for perceived constraints.

Covariates

Parents' education level was used as an indicator of childhood SES. Educational attainment and household income were used as measures of participants' SES. Other covariates included age, gender, race, Hispanic ethnicity, and marital status. We included an indicator variable for whether the participant was born in the United States (i.e., nativity), because nativity may be associated with parental education. Whether the father was absent from the household was included as an additional measure that could affect development of sense of control (Sigle-Rushton & McLanahan, 2002). We used the number (among seven possible) of self-reported chronic medical conditions as a measure of health.

Statistical Analysis

Data of each survey were analyzed separately as independent replicates addressing the same research question. We examined associations using regression analysis, with initial bivariate models testing for trends between each measure of sense of control and increasing paternal and maternal education. To test if parental education was associated with sense of control in adulthood, independent of the participant's SES and other characteristics, we used multivariate linear regression models. All covariates were entered simultaneously in the models. There was no evidence of collinearity among the independent variables in either survey. We tested interactions between parental education and age, gender, and the participant's educational attainment to determine if these factors moderated the association between parental education and sense of control. We also tested interactions between paternal and maternal education levels.

Analyses used procedures that accounted for the complex weighted sampling of the surveys. We used SAS Version 9.2 (SAS Institute, Cary, NC) for analyses.

Results

Characteristics of the Samples

The MIDUS sample had a mean age of 45.3 years, and the HRS sample had a mean age of 65.5 years (Table 1). In MIDUS, 26% of participants' fathers and 21.9% of participants' mothers had 8 years of education or less, while 40% of fathers and 35.9% of mothers of HRS participants had 8 years of education or less. Both samples had generally high levels of mastery and low levels of perceived constraints. Education levels of participants, their fathers, and their mothers were highly correlated (online Supplemental Table 1).

Table 1
Characteristics of the Samples

	MIDUS	HRS
Age, years	45.3 ± 0.3	65.5 ± 0.2
Male, %	43.4	45.8
White, %	82.3	87.2
Black, %	11.1	8.7
Other race, %	6.6	4.1
Hispanic ethnicity, %	3.8	6.5
Born outside U.S., %	5.6	7.7
Household income, U.S. dollars	63,966 ± 1,038	75,067 ± 5,138
Married, %	68.0	68.4
Father absent from household, %	6.9	7.0
No. of medical conditions, median (interquartile range)	0 (0, 1)	2 (0, 4)
Education		
0–8 years, %	2.9	7.6
9–12 years, %	48.4	43.3
13–15 years, %	25.7	23.6
16 or more years, %	23.0	25.5
Father's education		
0–8 years, %	26.0	40.0
9–12 years, %	37.3	31.1
13–15 years, %	8.2	5.7
16 or more years, %	13.0	8.3
Missing, %	15.5	14.9
Mother's education		
0–8 years, %	21.9	35.9
9–12 years, %	50.1	41.8
13–15 years, %	11.4	7.1
16 or more years, %	9.4	6.3
Missing, %	7.2	8.9
Personal mastery[a]	5.8 ± 0.02	4.7 ± 0.02
Perceived constraints[a]	2.8 ± 0.02	2.2 ± 0.02

Note. Plus/minus values are mean ± standard error. MIDUS = National Survey of Midlife Development in the United States; HRS = Health and Retirement Study.
[a] Possible range in MIDUS 1–7 and in HRS 1–6.

Association of Sense of Control Measures With Parental Education

In unadjusted analyses, participants in MIDUS whose parents had more schooling had higher levels of personal mastery and lower levels of perceived constraints than those whose parents had less education (Table 2). Associations were stronger for perceived constraints (p for trend $< .0001$ for both father's and mother's educational attainment) than for personal mastery (p for trend $= .03$). In HRS, there were strong associations between both the father's and the mother's educational attainment and personal mastery and perceived constraints (p for trend $< .0001$; see Table 2). Participants with missing data on parental education had scores on the sense of control measures that were similar to or more extreme than those whose parents had 0–8 years of education.

Adjustment for Participant Sociodemographic Characteristics

In both MIDUS and HRS, there was no association between either parent's education level and personal mastery in adjusted

Table 2
Unadjusted Mean Scores ± Standard Error of Sense of Control Measures by Parental Education Level

Variable	MIDUS		HRS	
	Personal mastery	Perceived constraints	Personal mastery	Perceived constraints
Father's education				
Missing	5.91 ± .05	3.04 ± .07	4.60 ± .05	2.50 ± .04
0–8 years	5.75 ± .04	2.93 ± .05	4.68 ± .03	2.33 ± .03
9–12 years	5.85 ± .03	2.75 ± .04	4.87 ± .03	2.10 ± .03
13–15 years	5.89 ± .06	2.61 ± .07	4.86 ± .07	1.98 ± .07
16 or more years	5.90 ± .05	2.46 ± .06***	4.96 ± .05***	1.89 ± .06***
Mother's education				
Missing	5.81 ± .09	3.16 ± .11	4.62 ± .06	2.58 ± .05
0–8 years	5.77 ± .04	3.01 ± .06	4.63 ± .03	2.41 ± .03
9–12 years	5.86 ± .03	2.78 ± .03	4.84 ± .03	2.09 ± .03
13–15 years	5.86 ± .05	2.59 ± .07	4.93 ± .06	1.90 ± .06
16 or more years	5.94 ± .06*	2.35 ± .06***	4.93 ± .05***	1.92 ± .07***

Note. The possible range for the scales in National Survey of Midlife Development in the United States (MIDUS) was 1–7 and in Health and Retirement Study (HRS) was 1– 6.
* p for trend $< .05$. *** p for trend $< .0001$.

analyses (Table 3). Father's education level was also not associated with perceived constraints in either survey. However, in MIDUS, participants whose mothers had 16 years or more of schooling had significantly lower levels of perceived constraints than those whose mothers had 0–8 years of schooling. In HRS, participants whose mothers had either 9–12 years or 13–15 years of schooling had lower levels of perceived constraints than participants whose mothers had 0–8 years of schooling. Perceived constraints were also somewhat lower among participants whose mothers had 16 years of schooling or more, but the difference was

Table 3
Unstandardized Betas (and Standard Errors) for Associations of Parental Education Levels and Personal Characteristics With Measures of Sense of Control

Variation	MIDUS		HRS	
	Personal mastery	Perceived constraints	Personal mastery	Perceived constraints
Age, years	−.002 (.002)	.001 (.002)	−.001 (.002)*	−.003 (.002)
Male	.20 (.038)***	−.158 (.046)**	.013 (.037)	−.012 (.038)
Black	.151 (.061)*	−.048 (.075)	.145 (.051)*	−.013 (.076)
Other race	.092 (.081)	.277 (.10)*	.034 (.088)	−.07 (.104)
Hispanic ethnicity	.098 (.104)	−.289 (.127)*	.226 (.067)*	−.052 (.08)
Born outside U.S.	−.223 (.087)*	.1 (.106)	−.098 (.067)	.052 (.064)
Log (household income)	.033 (.01)**	−.078 (.012)***	.081 (.02)***	−.11 (.023)***
Married	−.048 (.041)	−.104 (.05)*	.043 (.046)	−.107 (.049)*
Father absent	−.186 (.102)	−.097 (.125)	−.024 (.072)	.001 (.11)
No. of medical conditions	−.099 (.024)***	.231 (.029)***	−.082 (.012)***	.134 (.015)***
Education				
0–8 years	Reference	Reference	Reference	Reference
9–12 years	−.057 (.114)	−.54 (.14)***	.201 (.084)*	−.288 (.116)*
13–15 years	−.125 (.11)	−.69 (.146)***	.168 (.092)	−.383 (.122)***
16 or more years	−.03 (.122)	−.91 (.15)***	.24 (.093)*	−.559 (.11)***
Father's education				
0–8 years	Reference	Reference	Reference	Reference
9–12 years	−.054 (.053)	.001 (.065)	−.054 (.051)	.001 (.048)
13–15 years	−.07 (.08)	.004 (.098)	−.012 (.077)	−.017 (.078)
16 or more years	−.071 (.077)	.022 (.094)	−.057 (.068)	−.006 (.071)
Missing	−.272 (.083)**	−.076 (.101)	.114 (.068)	.083 (.064)
Mother's education				
0–8 years	Reference	Reference	Reference	Reference
9–12 years	−.004 (.054)	.032 (.066)	−.069 (.04)	−.138 (.047)*
13–15 years	.003 (.076)	.085 (.094)	−.124 (.073)	−.21 (.064)*
16 or more years	−.035 (.084)	−.247 (.103)*	−.064 (.088)	−.114 (.093)
Missing	.084 (.089)	.004 (.109)	−.069 (.07)	.048 (.062)

Note. MIDUS = National Survey of Midlife Development in the United States; HRS = Health and Retirement Study.
* $p < .05$. ** $p < .001$. *** $p < .0001$.

not significant, in part due to the small number in this subgroup. Additionally, those whose mothers had 16 or more years of education were themselves more highly educated (65% vs. 22% college graduates; $p < .0001$) and had substantially higher mean incomes ($71,680 vs. $37,421; $p < .0001$) than those with less educated mothers; adjustment likely attenuated the difference in perceived constraints between this subgroup and the other participants. Testing fathers' and mothers' education levels in separate models did not alter these associations. The difference in perceived constraints by levels of maternal education was 20%–24% of the difference in perceived constraints by levels of participant education (online Supplemental Table 2).

Older age was associated with lower levels of mastery in HRS, but not in MIDUS (Table 3). Income and number of medical conditions were strongly associated with sense of control in both surveys. Men had higher levels of mastery and lower levels of perceived constraints than women in MIDUS. Blacks had higher levels of mastery than whites in both samples. Hispanics also had higher levels of mastery than non-Hispanics in HRS and lower levels of perceived constraints in MIDUS. Those born outside the United States had lower levels of mastery in MIDUS. Being married was associated with lower levels of perceived constraints.

Tests of Moderation

There was no evidence of moderation by age or gender for either parental education measure in either survey. There were no significant interactions between either father's or mother's educational attainment and participant's education in predicting personal mastery or perceived constraints in HRS. In MIDUS, mother's education had a stronger inverse association with perceived constraints among those with less education ($p = .04$; online Supplemental Table 3). Among participants whose mothers had 0–8 years of education, adjusted mean perceived constraint scores varied from 4.06 in those with 0–8 years of education to 2.67 among college graduates; among participants whose mothers had 13 or more years of education, comparable scores were 2.54 and 2.41. There were no significant interactions between maternal and paternal educational attainment and sense of control measures in either survey.

Discussion

Maternal educational attainment was associated with perceived constraints in mid- and late-adulthood, even with adjustment for personal education level and income. These findings extend the associations of previous studies beyond young adulthood (Bosma et al, 1999; Lewis et al, 1999; Mirowsky & Ross, 2007). Associations were of similar magnitude in MIDUS and HRS, suggesting durability even in old age. Neither parent's level of education was associated with mastery. The pattern of associations was consistent in both surveys.

The differential associations of personal mastery and perceived constraints indicate that it is important to consider individual aspects of control in associations with parental education. Parental education is not associated with one's sense of competence during adulthood. Personal education, SES, and life experiences may override any differences in mastery associated with childhood circumstances. In contrast, beliefs regarding the degree to which circumstances in the environment are responsive to one's actions were associated with parental education, net of personal SES. This may reflect persistence of a worldview learned during childhood. Parents with lower levels of education may have imbued their children with the notion that others, including those higher in the social order, had influence on their lives. This association may have been overlooked in studies in which unidimensional measures of sense of control or only mastery was examined.

The lack of association with the father's education suggests that childhood SES, per se, may not be as important a correlate of perceived constraints as factors associated specifically with the mother's education level. This finding raises the possibility that SES-related differences in maternal instruction or parenting styles are important factors influencing the development of perceived constraints that last through adulthood. Alternatively, maternal education level may more closely reflect material aspects relevant to sense of control than paternal education level. This study does not identify factors that may mediate the association between maternal education and perceived constraints. No associations were found with the father's educational attainment when it was analyzed separately, indicating that this association was not masked by collinearity of parents' education levels. In MIDUS, the association with the mother's education was stronger among participants with less education, suggesting that personal education may partially attenuate associations with maternal educational attainment.

In MIDUS but not in HRS, men had higher levels of mastery and lower levels of perceived constraints than women. These results suggest that sense of control may wane to a greater degree during adulthood among men. In both surveys, Blacks had higher personal mastery than Whites, and Hispanics in HRS had higher personal mastery than non-Hispanics. These findings are consistent with Pearlin et al. (2007). Race/ethnicity may have specific associations with mastery not evident with other aspects of sense of control. Our findings for married persons were also consistent with prior associations (Bruce & Thornton, 2004; Schieman, 2001).

Inaccurate recall of parental education level may have lead to some misclassification, but any misclassification would not be expected to vary by sense of control. Information on educational attainment was missing for up to 9% of mothers and 16% of fathers, but persons with missing data were included in the analyses. The proportion of participants in HRS who had parents with 0–8 years of education was relatively high, which may have facilitated detection of associations. Increases in educational attainment over time may make it more difficult to detect similar associations in future studies.

This study adds to researchers' understanding of the development of mastery over the life course and on changing influences on mastery with age. Higher parental education has a consistent positive association with mastery in childhood, adolescence, and early adulthood (Flouri & Hawkes, 2008; Lefcourt, 1982). That childhood socioeconomic position continues to be associated with mastery through age 30 suggests that this association is not mediated by personal educational attainment, which for most people has been completed by age 30. Between age 30 and 45, the influence of parental education becomes more variable and is not present among older individuals (Lewis et al., 1999; Mirowsky & Ross, 2007). The transitional period into mid-adulthood is marked by solidification of independence, financially and emotionally, from one's family of origin and establishment in one's career and family. In this context, parental influences likely wane as new and more immediately influential life events occur: job promotion or

job loss, economic comfort or hardship, successful marriage or divorce, and good or ill health (Pearlin et al., 2007; Reynolds, Burge, Robbins, Boyd, & Harris, 2007). In contrast, contingency beliefs appear to reflect a more stable worldview that continues to be shaped by early maternal exposures even into old age.

This study indicates that being raised by a mother who is more highly-educated is associated with lower levels of perceived constraints late in adulthood. This may be part of the mechanism by which childhood SES is associated with well-being in adulthood. Sense of control may be one of the nonmaterial qualities gained in one's family of origin that contributes to the cumulative advantage associated with higher SES (Lynch, 2003; Ross & Wu, 1996). Interventions to foster a stronger sense of control in children may have benefits that persist throughout life.

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