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EMPIRICAL RESEARCH

Youth's Causal Beliefs About Success: Socioeconomic Differences and Prediction of Early Career Development

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Abstract Youth's career attainment is associated with socioeconomic background, but may also be related to their beliefs about causes of success. Relationships between 17-year-olds' socioeconomic status (SES) and causal beliefs about success, and whether these beliefs predict career attainment after completing a vocational or university degree were examined using data from the German Socio-Economic Panel Study ($n = 997$, 48.5% female). Youth with higher SES parents and those who attended higher levels of high schools were less likely to believe that success in society is due to external causes, but SES was unrelated to the belief that success is due to personal merit or ability. Youth who believe that success is due to external causes attained lower income, occupational prestige, and job autonomy, and slower increases in income over time. There were also significant indirect effects of youth's parents' SES and their own high school levels on career attainment through such external causal beliefs; merit beliefs, by contrast, were largely unrelated to career attainment. These results suggest that beliefs about external causes of success may uniquely contribute to the transmission and maintenance of SES across generations and over time.

Keywords Socioeconomic status · Causal beliefs · Career development · Youth · School-to-work transition

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Introduction

Intergenerational transmission of socioeconomic status (SES) is conveyed largely but not entirely by the direct transfer of wealth and the indirect transfer of social capital through the education system and labor market (Corak 2013). SES-differential psychological processes may play a significant role, complementing social structural SES differences in their influence on early career attainment. Among such psychological processes, beliefs about the causes of success in society are likely to influence youth's behavior regarding career choice and pursuit. Individuals from higher SES are more likely to believe that success is attainable by focused effort (Evans 2002; Kraus et al. 2012), individuals invest more time and effort into goals that are perceived as attainable (Eccles and Wigfield 2002; Heckhausen et al. 2010), and individuals who believe that success is due to factors within their own control report more rapid and positive progress toward their career goals (e.g., Shane and Heckhausen 2013, 2017). Thus, beliefs about causes of success in society may be an additional mechanism through which parents' SES is transferred to their children, and is then maintained over time. However, little research has investigated causal beliefs about success as a potential mechanism by which SES is transmitted across generations and maintained within an individual's life course.

The present study examines causal beliefs about success as a potential pathway of SES transmission and maintenance, and in so doing seeks to answer four questions related to youth's beliefs about how success is attained in society. First, are youth's causal beliefs about success associated with their parents' SES (intergenerational SES) and with their own academic attainment at age 17 (intragenerational SES)? Second, are youth's beliefs at age 17

about the role of merit in determining success longitudinally related to their career attainment following vocational or university degree completion, up to age 28? Third, are youth's beliefs at age 17 about the role of external causes in determining success longitudinally related to their career attainment following vocational or university degree completion, up to age 28? Fourth, are there indirect effects of youth's inter-generational and intra-generational SES on their career attainment through these causal beliefs about success? Together, these research questions seek to identify causal beliefs about success as a pathway by which SES is transmitted across generations and maintained across the life-course.

Importance of Causal Beliefs for Career Achievement

Beliefs about whether success in a particular goal is controllable inform individuals' goal selection and engagement levels, which in turn predict the likelihood of goal attainment (Eccles and Wigfield 2002; Heckhausen et al. 2010). Individuals are more likely to select, invest time and effort toward, and are more highly engaged with goals that they perceive as controllable and attainable (Heckhausen et al. 2010; Rotter 1966; Weiner 1985, 2000), leading to greater success in attaining these goals (Eccles and Wigfield 2002; Heckhausen et al. 2010). Greater success in achieving goals promotes individuals' beliefs about the controllability of their goals (Mirowsky and Ross 2007; Skinner et al. 1998), forming a positive feedback cycle that encourages faster progress towards goals and greater overall goal attainment (see Fig. 1). Higher control beliefs lead to greater levels of goal engagement and greater investment of time and effort into goal pursuits (Path A). This goal engagement leads to greater success in achieving goals (Path B), which feeds back into the first stage by promoting control beliefs (Path C).

The belief that success is attained via one's effort and ability (i.e., through personal merit) reinforces individuals' perceptions that goal attainment is personally controllable and in so doing encourages greater engagement with career goals (i.e., path A in Fig. 1) and which ultimately leads to greater progress toward career goal attainment (i.e., path B in Fig. 1) (Shane and Heckhausen 2013, 2016, 2017; Shane et al. 2012). Beliefs that one has personal control over one's career goal attainment reinforces a general mastery orientation and optimism about career goals that lead to higher engagement and less work-related burnout over time (Salmela-Aro et al. 2009). Conversely, youth who believe that success is due to factors outside of their direct control (e.g., due to luck) set lower educational goals (Kay et al. 2016), and are less engaged with and more likely to disengage from their career goals (Shane and Heckhausen 2016; Shane et al. 2012). Beliefs about a lack of control reinforce task-avoidant behavior which is associated with lower levels of work engagement (Salmela-Aro et al. 2009). Thus, causal beliefs help calibrate individuals' choice of and commitment toward goals, in turn influencing long-term goal attainment.

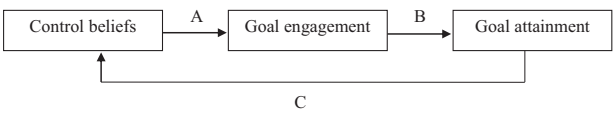

Fig. 1 Control beliefs—goal engagement—goal attainment cycle by which control beliefs promote goal engagement, which leads to greater goal attainment, and in turn encourages greater control beliefs

Importance of SES and Opportunities for Success

Individuals' opportunities for career success are limited by their SES, with wages and economic status persisting across generations (Cingano 2014; OECD 2010). In Germany, for example, parents' income explains approximately one third of the variance in children's income (OECD 2010). Such SES-transmissions may not only be conveyed via socio-structural differences in resources and access to education and careers, but also involve SES-specific belief systems about success in society. That is, parents may transmit beliefs about opportunities for control to their children, starting the control-engagement-success cycle depicted in Fig. 1. Adults from higher SES think that society is more meritocratic (Kunovich and Slomczynski 2007), and believe that they have more control over their environment (Kraus et al. 2012). Youth from higher SES families may share these beliefs because they reflect objective advantages and also because such belief systems are transmitted from parents to children through social learning and direct instruction (Jennings et al. 2009; Whitbeck and Gecas 1988). Accordingly, parents may convey to their children their beliefs about the importance of investing effort into goals (Armstrong 2012). Youth who expect to have a high SES when they are older are more likely to believe that success is based on individual merit and not based on luck (Shane and Heckhausen 2013). Moreover, youth who anticipate and experience positive labor market outcomes during the school-to-work transition are more likely to believe that their own merit will enable them to attain future upward social mobility (Shane and Heckhausen 2017). If parental SES is related to youth's beliefs that success is due to merit and not due to external or uncontrollable causes, and these beliefs are related to young adults' career success, then this may be one way in which SES is transmitted across generations.

Youth's own successes or failures may also contribute to their control-engagement-success cycles and long-term goal attainment. In the German context, youth's success may be

reflected by the level of high school they attend. Starting in 4th grade, students are assigned to one of three educational levels based on prior academic performance and teacher recommendations. The highest achieving students attend upper secondary school (*Gymnasium)*, which prepares them for university programs, while lower achieving students attend intermediate secondary school (*Realschule*) or lower secondary school (*Hauptschule*) which prepare students for technical schools or vocational training (Pietsch and Stubbe 2007). The early academic successes or failures that lead to students' placements in academic tracks may inform their control beliefs, with higher achieving students perceiving greater control as academic achievement leads to success expectancies (Wigfield and Eccles 2002), which would ultimately contribute to their long-term career attainment.

The Present Study

The present study examines the relationships between youth's background SES, their causal beliefs about how success in society is attained, and their career attainment in early adulthood following completion of a vocational or university degree, illustrated in Fig. 2. First, we examine associations between 17-year-olds' parents' SES (intergenerational SES transmission) and the level of high school (lower, middle- or upper tier in Germany's 3-tiered high-school system) they attended (intra-generational SES maintenance) with their beliefs that success in society is due to personal merit or to external and uncontrollable factors. We hypothesize that youth from higher SES backgrounds (i.e., higher parental SES and higher high school level) will be more likely to believe that success is attained through individual merit (*hypothesis 1a*) and less likely to believe that success is attained through external and uncontrollable factors (*hypothesis 1b*). Next, we test whether these causal beliefs at age 17 are associated with later markers of career attainment (i.e., monthly income, job prestige, and job autonomy) up to 4 years after university or vocational degree completion until age 28. We hypothesize that youth who believe that success in society is due to individual merit will report more positive career attainment (*hypothesis 2a*) and faster increases in career attainment as time since graduation and age increase (*hypothesis 2b*). On the other hand, we expect youth who believe that success in society is due to external factors to report less positive career attainment (*hypothesis 3a*), and slower increases in these outcomes as time since graduation and age increase (*hypothesis 3b*). Finally, we investigate whether there are indirect effects of youth's SES on their career attainment that are mediated through their beliefs about how success is attained in society. In this regard, we predict that both parental SES and high school level will have significant indirect effects on career outcomes and trajectories through youth's belief that success is due to merit (i.e., through higher merit beliefs) (*hypothesis 4a*, represented by the solid lines in Fig. 2) and due to external causes (i.e, through lower external causes beliefs) (*hypothesis 4b*, represented by the dashed lines in Fig. 2).

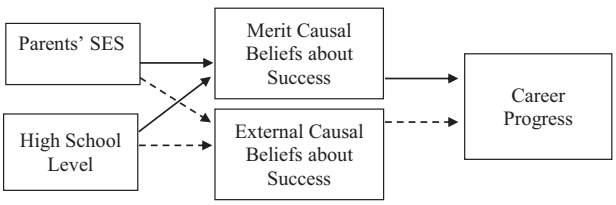

Fig. 2 Hypothesized associations between parents' SES and youth's high school level, beliefs about success, and career attainment. Solid lines represent expected positive associations; negative lines represent expected negative associations

Method

Sample

Data were drawn from the German Socio-Economic Panel study (SOEP). Participants were included if they entered the panel at age 17 between 2000 and 2011, completed the Youth Questionnaire upon entry, and subsequently reported completing a vocational or university degree before 2013 ($n = 997$, 48.5% female). Markers of career attainment for these participants were gathered from the SOEP annual surveys for up to 4 years after they reported completing their degree until age 28 or 2013 (if they entered the panel after 2002 and were therefore younger than 28 at the end of the study). Full details of the SOEP Youth Questionnaire sampling and methodology, and subsequent annual SOEP surveys can be found in the SOEP data documentation (Frick and Goebel 2011; Kroh et al. 2015). Youth were eligible to participate in the Youth Questionnaire if a parent was included in the annual SOEP questionnaire; households were initially selected through a multi-step random sampling of Germans, including East and West Germans, foreigners and immigrants, and high-income Germans. Initial participation rates (Kroh et al. 2015) ranged from 40–70% depending on subsample. Participants contributed up to 4 years of career attainment measures after completing a vocational or university degree. In total, 215 participants (21.6%) contributed 4 years of data, 236 (23.7%) contributed 3 years of data, 226 (22.7%) contributed 2 years of data, and 320 (32.1%) contributed 1 year of data.

Measures

Causal beliefs about success

Participants' beliefs about how success is attained in society were measured in the SOEP Youth Questionnaire at age 17.

Success due to merit The belief that success in society is attained through personal merit and effort was measured with five items such as "success in German society is achieved by working hard" and "through intelligence" (Sandberger 1983). Items were scored 1 = agree completely to 4 = do not agree at all, and were recoded so that higher scores reflect greater agreement that success is due to merit. All items were normally distributed (skew and kurtosis < |2|), Kaiser-Meyer-Olkin test of sampling adequacy indicated a middling degree of common variance (.718), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ($\chi^2 = 413.98$, $p < .001$). Items were averaged and inter-item reliability was acceptable ($\alpha = .61$).

Success due to external causes The belief that success is due to external and uncontrollable causes was measured through seven items such as "what one achieves in life is mainly a question of luck or fate" and "others make decisions regarding my life" (Richter et al. 2013). Items were scored from 1 = agree completely to 4 = do not agree at all until 2005 and then from 1 = do not agree at all to 7 = agree completely from 2006–2011. Scales were recoded so that higher scores reflect greater agreement and were standardized using a z-transformation. All items were normally distributed (skew and kurtosis < |2|), Kaiser–Meyer–Olkin test of sampling adequacy indicated a middling degree of common variance (.790), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ($\chi^2 =$ 1,166.85, $p < .001$). Items were averaged and inter-item reliability was acceptable ($\alpha = .74$).

Socioeconomic status

Participants' parental (intergenerational) SES combined the highest level of either parents' education (coded as 1 = high-school or less, 2 = vocational training, or 3 = university degrees or higher) and the highest level of either parents' occupational prestige, as measured in the SOEP biographical information survey. Participants parents' occupational prestige was coded according to the Standard International Occupational Prestige Score (SIOPS) (Ganzeboom and Treiman 1996). Occupations are scored from 6 to 78, with higher scores indicating that participant had a parent who worked in a more prestigious occupation. To combine items, both were standardized and then averaged.

Participants' own high school achievement was assessed by the level of high school youth attend (intragenerational SES), as reported in the Youth Questionnaire at age 17. Participants' high school was coded 1 = *Hauptschule*, or the lowest tier, 2 = *Realschule*, or the middle tier, and 3 = *Gymnasium*, or the highest tier.

Career attainment

Participants' objective career attainment was assessed in the SOEP annual surveys, and was gathered for as many years as were available up to 4 years after completing a vocational or university degree until age 28. Three different measures of career attainment were assessed:

Monthly income Participants were asked their gross income from the previous month each year until age 28 after completing a vocational or university degree. Since the focus of this research is on individuals who are in the workforce, any year in which a participant indicated that they did not work in the previous month was coded as missing rather than as 0, and thus that observation was not included in the analyses. In addition to using monthly income as reported by participants, models were also run using a logarithmic transformation of monthly income.

Job prestige Participants' job prestige was coded according to SIOPS each year until age 28 (described above for parents; Ganzeboom and Treiman 1996) from their annual reports of their primary occupation. Any year in which a participant did not work or was working in an apprenticeship, which are not categorized by SIOPS, was coded as missing to exclude that observation from the analyses.

Job autonomy Participants' job autonomy was gathered from the SOEP generated variables (SOEP Group 2014), and was coded based on their reports of their primary occupation each year until age 28. Job autonomy was categorized according to ISCO-88 classifications, based on the typical tasks and responsibilities associated with the jobs (Hoffmeyer-Zlotnik and Geis 2003; SOEP Group 2014). Jobs were coded 1 = low autonomy jobs such as manual laborers which require little specialization and are highly supervised to 5 = high autonomy jobs such as managers and freelancers which are not typically supervised and require high levels of specialization. Any year in which a participant did not work or was in an apprenticeship or internship was coded as missing to exclude that observation from the analyses.

Demographics

Participants' degree type (vocational degree = 1, university degree = 2) was measured in the annual surveys up to age 28. Gender and year of birth (because all participants entered the panel at age 17, but in different years from 2000–2011, so were born from 1983–1994) were gathered from SOEP biographical data and were included as covariates. Because participants completed their vocational or university degrees at different ages (from age 18–27), age was included as a covariate for all analyses involving career attainment.

Statistical Analyses

Analyses were conducted in Stata IC 13 (StataCorp 2013). Multiple linear regression analyses tested cross-sectional associations between participants' parental SES and their own high school level and their beliefs about how success is attained when they were 17 years of age (*hypotheses 1a–1b*). Multilevel modeling (MLM) was used to test longitudinal associations between participants' causal beliefs about how success is attained when they were 17 years of age and their career attainment for up to 4 years after post-secondary school degree completion until age 28 (*hypotheses 2–3*). Models were constructed separately for each belief and each measure of career attainment; all models controlled for gender, year of birth, and age, and models predicting monthly income also controlled for the number of hours worked that month. First, fixed effects of each of participant's causal beliefs about success on each measure of career attainment were calculated (*hypotheses 2a and 3a*). Next, interactions between participants' beliefs about success and time since graduation and then with age were tested to determine whether causal beliefs were associated with trajectories in career attainment over time (*hypotheses 2b and 3b*). Finally, we examined indirect effects from participants' parental SES and their own high school level through their causal beliefs on measures of their career attainment (i.e., main effects) or career trajectories (i.e., rates of change in career attainment over time since graduation or age). Bootstrapping was used to identify confidence intervals and significance levels for the estimates of indirect effects (*hypotheses 4a and 4b*). All regression and MLM analyses used centered variables as predictors in order to increase the meaningfulness of the intercept.

Results

Descriptive statistics for, and inter-item correlations between participants' causal beliefs about success, gender, and parental SES and high school level at age 17 are presented in Table 1.

Associations Between SES and Causal Beliefs about Success

Hypotheses 1a and *1b* examined associations between participants' parental SES and high school level and their causal beliefs about success at age 17. Table 2 presents results from the regression analyses predicting participants' beliefs that success is due to merit and external causes from their parental SES and high school level at age 17, controlling for gender and year of birth. Contrary to *hypothesis 1a*, the belief that success is due to merit was not associated with parents' SES or participants' high school level. However, both participants' parents' SES and participants' high school level were negatively associated with their belief that success is due to external causes, supporting *hypothesis 1b*.

Associations Between Merit Beliefs and Career Attainment

Direct effects of merit beliefs

Multilevel modeling tested the fixed and random effects of participants' causal belief that success is due to merit on their monthly income, job prestige, and job autonomy (presented in Tables 3–5). *Hypothesis 2a* predicted that participants' belief that success is due to merit would be positively associated with career attainment. However, participants' causal belief that success is due to merit was not significantly associated with their monthly income (logarithmic or untransformed), job prestige, or job autonomy (shown in Tables 3–5, Model 1).

Table 1 Descriptive statistics and inter-item correlations of demographics and beliefs about success in society

	Mean (SD)	Male	Parents' SES	High school	Merit Causal Beliefs
Male	509 (51.05%)				
Parents' SES	−.03 (.91)	−.04*			
High school	2.19 (.60)	−.17***	.32***		
Merit causal beliefs	3.41 (.39)	−.02	.03	.04*	
External causal beliefs	−.01 (.54)	−.04	−.10***	−.10***	−.06*

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Regression analyses predicting merit and external causes beliefs with gender, year of birth, parents' SES, and high school

	Success achieved through					
	Merit			External causes		
	B	95% CI	β	B	95% CI	β
Intercept	3.41***	3.39, 3.44		−.01	−.08, .06	
Male	−.00	−.05, .05	−.01	−.04†	−.09, .00	−.04
Year of birth	−.01†	−.02, −.00	−.07	.00	−.01, .01	.02
Parents' SES	.01	−.02, .04	.03	−.04**	−.07, −.02	−.08
High school	.04	−.00, .08	.07	−.07**	−.11, −.03	−.08

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Hypothesis 2b predicted that the belief that success is due to merit would be associated with career trajectories over time since graduation and age. However, contrary to *hypothesis 2b*, merit beliefs were not associated with career trajectories over time since graduation for income, job prestige, or job autonomy (shown in Tables 3–5, Model 2a). Those with high merit beliefs had marginally faster increases in job prestige by age and increases in job autonomy by age (shown in Tables 4 and 5, Model 3a). However, no such differences were found for increases in monthly income (logarithmic or untransformed) for merit beliefs by age (shown in Table 3, Model 3a). Collectively, these results provide limited support for *Hypothesis 2b*.

Indirect effects of SES through merit beliefs

Hypothesis 4a predicted that there would be significant indirect effects of SES on career attainment through the belief that success is due to merit. Indirect effects are presented in Table 6. However, neither parents' SES nor participants' high school level yielded indirect effects through merit on income (with the logarithmic transformation or untransformed), occupational prestige, or autonomy. Similarly, there were no indirect effects of parents' SES or participants' high school level through merit beliefs on the rate of change in income (with the logarithmic transformation or untransformed), occupational prestige, or autonomy by time since degree completion or age high school. These findings do not support *hypothesis 4a*, that parents' SES and participants' high school level would have indirect effects on career attainment and trajectories through the belief that success is attained through merit.

Associations Between External Causes Beliefs and Career Attainment

Direct effects of external causes beliefs

As predicted by *hypothesis 3a*, participants' belief that success is due to external causes had marginally negative associations with their monthly income (when run with an untransformed variable; no significant effect was found with the logarithmic transformed income variable), and significantly negative associations with job prestige, and job autonomy (shown in Tables 3–5, Model 1). Participants who believed that success is due to external causes had slower increases in income by years after graduation and by age (marginally slower increases with the logarithmic transformed income variable), supporting *hypothesis 3b*. However, the belief that success is due to external causes was not related to trajectories of occupational prestige by years after graduation or age nor were they related to trajectories of autonomy by years after graduation or age, limiting the support for *hypothesis 3b*.

Indirect effects of SES through external causes beliefs

Hypothesis 4b examined whether there were significant indirect effects of parents' SES or participants' high school level on career attainment through the belief that success is due to external causes. Indeed, there were significant indirect effects of parents' SES and of participants' high school level through external causes beliefs on income (with the logarithmic transformation and untransformed), job prestige, and autonomy, supporting *hypothesis 4b*, shown in Table 6. These effects were positive, in that youth with higher SES parents and attending higher levels of high school had lower beliefs in external causes of success, and these lower beliefs had positive effects on career attainment.

Additionally, there were significant indirect effects of parents' SES and participants' high school level through external causes beliefs on the rate of change in income by time since degree completion and age (with the logarithmic transformation and untransformed), the rate of change in occupational prestige by time since degree completion and age, and on the rate of change in occupational autonomy by time since degree completion and age (shown in Table 6). Collectively, these findings provide support for *hypothesis 4b*, that parents' SES and participants' high school level have significant indirect effects on career attainment and

Table 3 Maximum likelihood multilevel modeling estimates for untransformed income predicted by the belief that success is due to merit and external causes

	Untransformed monthly income B [95% CI]				
	Model 1 Main effects	Model 2a Merit × years post-degree	Model 2b Ext causes × years post-degree	Model 3a Merit × age	Model 3b Ext causes × age
Fixed part					
Intercept	1,842.53 [1,785.67, 1,899.38]***	1,845.54 [1,788.59, 1,902.48]***	1,846.00 [1,789.16, 1,902.84]***	1,839.09 [1,784.60, 1,893.57]***	1,837.68 [1,783.23, 1,892.14]***
Male	209.56 [100.30, 318.82]***	209.00 [99.83, 318.17]***	206.99 [97.95, 316.02]***	208.64 [103.73, 313.54]***	206.45 [101.62, 311.28]***
Year of birth	26.76 [5.03, 48.49]*	26.15 [4.41, 47.89]*	26.25 [4.55, 47.95]*	29.31 [7.98, 50.64]**	30.44 [9.15, 51.72]**
Parents' SES	−4.79 [−68.93, 59.34]	−4.17 [−68.36, 60.03]	−3.88 [−67.90, 60.14]	−14.98 [−77.12, 47.15]	−16.41 [−78.25, 45.43]
High school	156.00 [48.22, 263.77]**	159.29 [51.42, 267.16]**	155.56 [38.15, 263.23]**	158.40 [54.55, 262.25]**	158.17 [54.44, 261.89]**
Hours	27.86 [23.44, 32.28]***	27.46 [23.02, 31.91]***	27.48 [23.05, 31.92]***	26.44 [22.00, 30.88]***	26.34 [21.91, 30.77]***
University degree [a]	552.76 [378.88, 726.65]***	550.99 [374.93, 727.05]***	540.54 [365.09, 716.00]***	523.55 [349.59, 697.56]***	509.66 [335.50, 683.82]***
Age	71.00 [38.28, 103.72]***	70.46 [37.69, 103.23]***	70.85 [38.15, 103.55]***	67.58 [34.84, 100.31]***	67.28 [34.60, 99.96]***
External causes	−89.66 [−193.01, 13.69]†	−88.99 [−192.27, 14.28]†	−121.93 [−228.40, −15.46]*	−91.22 [−190.56, 8.11]†	−121.03 [−223.60, −18.46]*
Merit	26.46 [−110.40, 163.31]	36.19 [−103.09, 175.48]	28.23 [−108.36, 164.82]	34.06 [−99.15, 167.28]	25.31 [−106.25, 156.86]
Years post-degree	34.35 [1.37, 67.32]*	36.20 [2.76, 69.50]*	34.88 [1.65, 68.11]*	41.30 [7.97, 50.64]*	41.56 [8.74, 74.39]*
Merit × years post-degree		17.60 [−25.11, 60.31]			
Ext causes × years post-degree			−42.69 [−76.89, −8.48]*		
Merit × age				27.10 [−15.81, 70.00]	
Ext causes × age					−40.78 [−74.95, −6.60]*
Random					
Years post-degree / age (SE)		1,571.17 (1,343.61)	1,159.27 (1,311.13)	8,138.25 (2220.61)	7,863.51 (2,211.77)
Intercept (SE)	348,549 (28,007.92)	284,860.5 (34,544.84)	345,837.6 (27,958.39)	281,357.5 (28,590.19)	281,593.4 (28,645.27)
Log likelihood	−16,017.67	−16,008.34	−16,017.79	−16,005.09	−16,003.15

[a] Relative to vocational degree holders. Model 1 includes fixed effects only. Models 2a and 2b include fixed and random effects including interactions between years post-graduation and merit beliefs and external causes beliefs. Models 3a and 3b include fixed and random effects including interactions between age and merit and external causes beliefs

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

career trajectories through their negative association with the belief that success is due to external causes, and the negative associations between this causal belief and later career attainment and trajectories.

Discussion

This study investigated whether youth's background socioeconomic status (SES) was related to their beliefs about how success is attained in society and whether those beliefs predict career attainment or trajectories after university or vocational degree completion. Youth with parents from higher SES and who attended higher levels of high school believed that success is less likely to be due to external causes, but SES and high school status were not associated with the belief that success is due to personal merit. These external causal beliefs were associated with worse career attainment over time, and were one way in which socioeconomic background predicted later career outcomes. Beliefs about merit were largely unrelated to career outcomes. These results support the idea that socioeconomic status shapes youth's causal beliefs about success in society, and in turn through this influence, is associated with youth's career attainment in early adulthood.

Beliefs about External Causes of Success

At age 17, participants from lower socioeconomic backgrounds (i.e., those whose parents had a lower SES, and those who attended a lower level of high school) were more likely to believe that success is due to external and uncontrollable causes. Lower SES youth have fewer opportunities for success (OECD 2010), so these differences in youth's endorsement of external factors as a cause of success may be indicative of their actual opportunities for

Table 4 Maximum likelihood multilevel modeling estimates for job prestige predicted by the belief that success is due to merit and external causes

	Job prestige B [95% CI]				
	Model 1 Main effects	Model 2a Merit × years post-degree	Model 2b Ext causes × years post-degree	Model 3a Merit × age	Model 3b Ext causes × age
Fixed part					
Intercept	42.54 [41.90, 43.17]***	42.51 [41.87, 43.16]***	42.52 [−41.87, 43.16]***	42.42 [41.77, 43.06]***	42.41 [41.76, 43.05]***
Male	−1.38 [−2.55, −.21]*	−1.50 [−2.67, −.33]*	−1.50 [−2.67, −.33]*	−1.47 [−2.65, −.29]**	−1.50 [−2.69, −.32]*
Year of birth	−.10 [−.33, .12]	−.11 [−.34, .11]	−.11 [−.34, .11]	−.11 [−.34, .12]	−.10 [−.33, .13]
Parents' SES	1.03 [.35, 1.71]**	1.06 [.38, 1.74]**	1.06 [.39, 1.74]**	1.07 [.38, 1.76]**	1.05 [.36, 1.73]**
High school	2.38 [1.23, 3.54]***	2.35 [1.19, 3.51]***	2.35 [1.19, 3.51]***	2.23 [1.06, 3.40]***	2.24 [1.07, 3.40]***
University degree [a]	5.95 [4.39, 7.50]***	6.24 [4.60, 7.88]***	6.22 [4.58, 7.87]***	6.19 [4.56, 7.81]***	6.10 [4.47, 7.73]***
Age	1.06 [.73, 1.40]***	1.03 [.68, 1.37]***	1.03 [.68, 1.37]***	1.04 [.68, 1.39]***	1.04 [.69, 1.40]***
External causes	−1.95 [−3.05, −.84]**	−1.94 [−3.05, −.84]**	−2.01 [−3.17, −.85]**	−2.00 [−3.11, −.88]**	−2.18 [−3.32, −1.03]***
Merit	.55 [−.96, 2.06]	.44 [−1.11, 2.01]	.43 [−1.08, 1.94]	.49 [−1.05, 2.03]	.40 [−1.13, 1.93]
Years post-degree	−.78 [−1.12, −.43]***	−.78 [−1.14, .42]***	−.78 [−1.14, −.42]***	1.04 [.68, 1.39]***	1.04 [.69, 1.40]***
Merit × years post-degree		.02 [−.43, .47]			
Ext causes × years post-degree			−.07 [−.42, .29]		
Merit × age				.28 [−.04, .60]†	
Ext causes × age					−.23 [−.53, .08]
Random					
Years post-degree / age (SE)		1.12 (.23)	1.13 (.23)	.73 (.17)	.76 (.17)
Intercept (SE)	60.51 (3.75)	60.00 (3.76)	59.97 (3.76)	60.11 (3.81)	59.92 (3.81)
Log likelihood	−9,255.41	−9,225.07	−9,225.00	−9233.70	−9,233.56

[a] Relative to vocational degree holders. Model 1 includes fixed effects only. Models 2a and 2b include fixed and random effects including interactions between years post-graduation and merit beliefs and external causes beliefs. Models 3a and 3b include fixed and random effects including interactions between age and merit and external causes beliefs

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5 Maximum likelihood multilevel modeling estimates for job autonomy predicted by the belief that success is due to merit and external causes

	Job autonomy B [95% CI]				
	Model 1 Main effects	Model 2a Merit × years post-degree	Model 2b Ext causes × years post-degree	Model 3a Merit × age	Model 3b Ext causes × age
Fixed part					
Intercept	2.29 [2.23, 2.34]***	2.29 [2.23, 2.35]***	2.29 [2.23, 2.35]***	2.29 [2.23, 2.34]***	2.29 [2.23, 2.34]***
Male	−.08 [−.18, .03]	−.08 [−.19, .03]	−.08 [−.18, .03]	−.08 [−.19, .03]	−.08 [−.19, .02]
Year of birth	−.00 [−.02, .02]	−.00 [−.02, .02]	−.00 [−.02, .02]	−.00 [−.02, .02]	−.00 [−.02, .02]
Parent SES	.03 [−.03, .09]	.04 [−.03, .10]	.03 [−.03, .10]	.04 [−.02, .10]	.04 [−.02, .10]
High school	.15 [.05, .25]**	.16 [.06, .26]**	.16 [.05, .26]**	.15 [.05, .25]**	.15 [.05, .26]
University degree [a]	.70 [.55, .86]***	.67 [.51, .84]***	.67 [.51, .83]***	.67 [.51, .83]***	.66 [.50, .82]***
Age	.11 [.07, .14]***	.11 [.08, .14]***	.11 [.08, .14]***	.10 [.06, .13]***	.10 [.07, .13]***
External causes	−.11 [−.21, −.01]*	−.11 [−.21, −.01]*	−.11 [−.22, −.00]*	−.11 [−.21, −.01]*	−.12 [−.23, −.02]*
Merit	−.01 [−.15, .12]	.00 [−.14, .15]	−.02 [−.15, .12]	−.01 [−.15, .13]	−.02 [−.15, .12]
Years post-degree	−.02 [−.06, .01]	−.02 [−.06, .01]	−.02 [−.06, .01]	−.01 [−.05, .02]	−.01 [−.05, .02]
Merit × years post-degree		.03 [−.03, .09]			
Ext causes × years post-degree			−.00 [−.05, .04]		
Merit × age				.03 [−.00, .06]†	
Ext causes × age					−.02 [−.05, .02]
Random					
Years post-degree / age (SE)		.03 (.00)	.03 (.00)	.02 (.00)	.02 (.00)
Intercept (SE)	.40 (.03)	.39 (.03)	.40 (.03)	.38 (.03)	.38 (.09)
Log likelihood	−3,401.85	−3,340.72	−3,341.22	−3,359.75	−3,359.59

[a] Relative to vocational degree holders. Model 1 includes fixed effects only. Models 2a and 2b include fixed and random effects including interactions between years post-graduation and merit beliefs and external causes beliefs. Models 3a and 3b include fixed and random effects including interactions between age and merit and external causes beliefs

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

success. This causal belief orientation may also reflect parents' beliefs, since lower SES individuals are less likely to believe they have control over their lives (e.g., Kraus et al. 2012), and youth learn causal beliefs from their parents (Eccles and Wigfield 2002; Parke and Buriel 2006). The belief that success is due to external factors may be self-protective and reflect a self-serving bias for low SES parents and for youth who have not experienced successes in school, allowing them to maintain self-esteem despite difficulties in attaining their career or educational goals (Campbell and Sedikides 1999).

External Causes of Success and Career Attainment

Participants who believed that success is due to external causes reported lower income, job prestige, and job autonomy up to 4 years after completing a vocational or university degree and up to age 28, and slower increases in income over that time. Youth's belief that success in society is due to external factors may reflect a belief that their own personal success is uncontrollable and not dependent on the effort they invest toward their goals. These external-oriented causal beliefs may lead youth to invest less effort into pursuing their career goals, and thus in turn experience less success in their early careers (Shane and Heckhausen 2016; Shane et al. 2012). Indeed, goal engagement mediates the associations between control beliefs and career attainment (Shane and Heckhausen 2016), suggesting that control beliefs are important for career attainment because of their effects on goal engagement. The slower increase in income over time among youth who believe that success is due to external causes may reflect path C in Fig. 1, with early failures reinforcing lower control beliefs, further discouraging the investment of time and effort into career goals.

Table 6 Indirect effects of beliefs parents' SES and high school attainment on job attainment and trajectories of job attainment through merit beliefs and external causes beliefs

	Untransformed monthly income B [95% CI]			Job prestige B [95% CI]			Job autonomy B [95% CI]		
		Trajectories by			Trajectories by			Trajectories by	
	Overall	Year post-degree	Age	Overall	Years post-degree	Age	Overall	Years post-degree	Age
Merit									
Parent SES	.17 [−.23, .51]	−2.56 [−11.48, 4.12]	−2.56 [−6.60, 1.47]	.00 [−.01, .02]	−.01 [−.11, .08]	−.03 [−.10, .03]	.00 [−.00, .00]	−.00 [−.01, .00]	−.00 [−.01, .00]
High school	.38 [−.72, 1.11]	−.42 [−6.21, .85]	.83 [−1.71, 5.66]	.00 [−.01, .02]	−.03 [−.14, .08]	.02 [−.09, .10]	−.00 [−.00, .00]	−.00 [−.01, .01]	.00 [−.00, .01]
Ext. causes									
Parent SES	3.92 [2.17, 4.53]***	17.35 [11.17, 29.44]***	18.20 [11.45, 26.62]***	.08 [.07, .09]***	.13 [.07, .24]***	.12 [.08, .20]***	.00 [.00, .01]***	.01 [.00, .02]**	.01 [.01, .02]**
High school	3.95 [2.54, 5.36]***	39.02 [26.37, 54.17]***	34.59 [21.10, 51.14]***	.08 [.06, .09]***	.25 [.13, .41]***	.21 [.11, .31]***	.00 [.00, .01]***	.02 [.01, .04]***	.02 [.01, .03]***

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Our findings also indicate that participants' beliefs that success is due to external causes are one way in which SES is transmitted across generations and maintained over time. Given the importance of these beliefs for youth's long-term career attainment, these beliefs may be one target for interventions aimed at increasing upward mobility among lower SES youth. Indeed, attributional retraining interventions which promote perceptions of control have shown success in improving academic and career motivation and outcomes, particularly for those most vulnerable (Haynes et al. 2009; Jackson et al. 2009).

Beliefs about Merit as a Cause of Success

We did not find the expected positive associations between socioeconomic background and the belief that success is due to personal merit or ability. Individuals across social settings are motivated to believe that success is controllable (Evans 2002), even in settings where this is not the case (Ledgerwood et al. 2011), so these beliefs may not be informed by actual opportunities or experiences. Youth's beliefs that success is due to personal merit and ability were also not related to their career attainment, nor were they a pathway by which socioeconomic advantages are transmitted or maintained across generations or time. However, previous research has found that these beliefs are associated with educational aspirations and achievement (Kay et al. 2016), as well as career-directed engagement (Shane et al. 2012; Shane and Heckhausen 2016). Beliefs about the importance of merit for success in society may be less stable than beliefs about external causes, and may not have the same long-term consequences for this reason. It is also possible that these merit beliefs do not have the same motivational consequences because they focus on society generally, as opposed to being specific to one's own personal merit, and beliefs about the importance of personal merit have a stronger influence on future expectations and motivation than more general beliefs about the importance of merit in society (Shane and Heckhausen 2017).

Limitations

Despite strengths of this study, it is not without limitations. Although participants' career attainment was assessed annually, their causal beliefs about success and their SES were only measured at age 17 and were used to predict career attainment up to age 28. Causal beliefs about success likely change as youth experience successes and setbacks in their goal pursuits while in school and during the school-to-work transition. Therefore, bi-directional effects between youth's career development and their causal beliefs about how success is attained should be explored in future multi-

wave longitudinal research. Although we suggest that youth's causal beliefs about success are related to career achievement through goal engagement and goal disengagement processes, no such mediators were assessed in this study, and this too would merit further research to specifically test such mediational pathways. Youth reported their causal beliefs about how success is attained generally, but the outcomes measured are all specific to their own careers. It is possible that youth have domain-specific causal beliefs about how success is attained and hold distinct causal beliefs for themselves and people in general (Shane and Heckhausen 2017). Finally, we found indirect effects of SES on career attainment through the beliefs about how success is attained, but these beliefs did not fully explain the effects of SES on career attainment. We do not suggest that these beliefs are the only way in which SES is transmitted across generations or maintained over time, but rather that they are one of many ways, others of which were not tested in this research.

Conclusion

Although SES is largely stable across generations and over time, the mechanisms by which it is transmitted and maintained are not always clear. This research identifies causal beliefs about success in society as one pathway by which socioeconomic status is maintained or even amplified across generations and over time. Higher SES youth are less likely to believe that success is due to external causes than their lower SES peers. This, in turn predicts greater early career success as measured by income, job prestige, and job autonomy after vocational or university degree completion, potentially amplifying the effect of intergenerational and intragenerational socioeconomic status. This research provides insight into how these causal belief systems originate and their implications for early career attainment and suggests a possible target for interventions with the goal of increasing social mobility as individuals pursue their careers.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval The authors used only de-identified data so were exempt from IRB review.

Informed Consent Consent was obtained by providing all participants (or their legal guardians if under 18 and guardians were available) with a declaration of data protection indicating that participation was voluntary and identities would be confidential.

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