

Contents lists available at [ScienceDirect](#)

Journal of Adolescence

journal homepage: [www.elsevier.com/locate/jado](http://www.elsevier.com/locate/jado)

## High-school predictors of university achievement: Youths' self-reported relationships with parents, beliefs about success, and university aspirations

Joseph S. Kay <sup>a,\*</sup>, Jacob Shane <sup>b</sup>, Jutta Heckhausen <sup>a</sup><sup>a</sup> University of California Irvine, USA<sup>b</sup> Brooklyn College, City University of New York, USA

### ARTICLE INFO

#### Article history:

Available online 22 September 2016

#### Keywords:

Academic achievement  
Beliefs about success  
Parent–child relationships

### ABSTRACT

Associations between youths' reported relationships with their parents, beliefs about how success is attained, educational aspirations, and university completion were examined. Data come from the German Socioeconomic Panel. At age 17, youth ( $n = 3284$ ) reported on their relationships with their parents, beliefs about success, and educational aspirations. University completion was assessed up to eight years later. At age 17, perceptions of parental warmth and interest in youths' academics were associated with beliefs that success is due to merit (positively) and that success is due to external factors or dominance over others (negatively). Beliefs that success is due to merit and external factors were associated with educational aspirations positively and negatively respectively. Educational aspirations positively predicted university completion up to eight years later. Relationships with parents had stronger associations with achievement when parents completed a university degree; beliefs about success had stronger associations with aspirations when parents did not.

© 2016 The Foundation for Professionals in Services for Adolescents. Published by Elsevier Ltd. All rights reserved.

Parents have an important influence on their children's beliefs, goals, and in what they invest effort. One area where this has long-term consequences is in children's engagement and achievement in education. Youths' perceptions of specific parenting behaviors, such as parents' involvement in their academics (Kim & Schneider, 2005; McNeal, 1999), as well as the overall reports of relationship quality (Hill et al., 2004; Pomerantz, Moorman, & Litwack, 2007; Spera, 2005), are important for youths' academic aspirations and achievement in high-school and post-secondary school. In addition to high aspirations, youth also need motivational resources in order to succeed: close to half of students across the Organisation for Economic Co-operation and Development (OECD) who begin university programs do not ultimately graduate (OECD, 2014). Those who believe that success is controllable are more likely to succeed (Eccles & Wigfield, 2002), but little research has examined motivational beliefs as a potential mechanism by which youths' perceptions of their relationships with their parents are associated with their academic aspirations and achievement.

\* Corresponding author. 4201 Social and Behavioral Sciences Gateway, University of California, Irvine, CA 92697-7085, USA.  
E-mail address: [jskay@uci.edu](mailto:jskay@uci.edu) (J.S. Kay).

## Motivational beliefs and parental relationships

Youths' long-term educational aspirations while in high-school are important predictors of their educational achievement (e.g., [Beal & Crockett, 2010](#); [Eccles & Roeser, 2009](#); [Schoon, 2008](#); [Vuolo, Mortimer, & Staff, 2014](#)). However, less is known about the motivational factors associated with educational aspirations. Individuals are more likely to set higher goals and are more highly engaged with their goals when they believe success is due to internally controllable factors (e.g., one's own merit) rather than uncontrollable or external factors ([Rotter, 1966](#); [Shane & Heckhausen, 2013, 2016](#); [Weiner, 1985](#)). Those who are more engaged with their goals believe they have more control over attaining these goals ([Gollwitzer & Kinney, 1989](#); [Gollwitzer, 2003](#); [Heckhausen & Gollwitzer, 1987](#)), which further stimulates greater engagement as a control–engagement cycle develops ([Mirowsky & Ross, 2007](#); [Shane, Heckhausen, Lessard, Chen, & Greenberger, 2012](#); [Skinner, Zimmer-Gembeck, Connell, Eccles, & Wellborn, 1998](#)). Conversely, individuals who believe they lack control over their goals (e.g., that success is attained due to fate or other external factors) are more likely to disengage from their goal pursuit ([Shane & Heckhausen, 2013, 2016](#)). Thus, youth who believe their educational goals are controllable are likely to set loftier educational goals and be more engaged in the pursuit of these goals, in turn leading to greater success in higher education.

Youths' perceptions of their parents help shape how they view the world ([Parke & Buriel, 2006](#)), and so may also inform their beliefs about the appropriateness and achievability of goals related to higher education. University students who perceive their parents to be warm also believe they have greater control over their actions and academic outcomes, which in turn is positively associated with their grades ([Fulton & Turner, 2008](#)). Furthermore, youth who report their parents to be warm tend to put more effort into pursuing their goals ([Armstrong, 2012](#)) and believe that the world is fair ([Dalbert & Radant, 2009](#)), leading to better academic outcomes over time ([Dalbert & Stoeber, 2006](#)). The belief that the world is fair can facilitate individuals' commitment to long-term goal pursuits ([Laurin, Fitzsimons, & Kay, 2011](#); [Shane & Heckhausen, 2016](#)), such as completing post-secondary education, possibly because of the corresponding belief that one will be rewarded according to one's own personal merit ([Heckhausen & Shane, 2016](#); [Shane & Heckhausen, 2013, 2016](#)). Thus, youths' perceptions of the controllability of success, and ultimately their educational aspirations, may be informed by their relationships with their parents, with parents who are perceived to be warm and supportive setting up an internal working model that their efforts will ultimately be fairly rewarded, leading to higher aspirations and achievement.

## Socioeconomic status moderates parental influences

While motivational beliefs and strategies may help youth attain educational goals, sociodemographic factors could constrain the realization of these goals. Youth from higher socioeconomic status (SES) are more likely to succeed in university ([OECD, 2014](#); [Schoon, 2008](#)), and have greater academic success, both in the United States ([Sirin, 2005](#)) and internationally ([Marks, 2005](#)). These associations result in part from differences in the quality of schools youth attend ([Perry & McConney, 2010](#)). Parents from higher SES can also provide more financial support and are more able to use social capital to help their children succeed ([Roksa & Potter, 2011](#); [Sirin, 2005](#)), and may be more inclined to do so when relationships with their children are stronger.

Parental behavior and attitudes can influence youths' academic motivation and achievement through different pathways depending on SES ([Hill et al., 2004](#)). Parents with higher levels of education typically have higher educational aspirations for their children, and their children have greater academic motivation and aspirations themselves, which predict greater academic achievement and continued higher SES ([Fan & Chen, 2001](#); [Schoon & Parsons, 2002](#); [Schoon, 2008](#); [Trusty, 1998](#)). Parents' goals for their children are more closely reflected by youths' goals when youth perceive their relationship to be warm ([Mortimer, Lorence, & Kumka, 1986](#)), so the combination of high parents' SES and relationships perceived to be warm may be associated with youths' high aspirations for themselves.

On the other hand, youth from lower SES benefit more from social support ([Malecki & Demaray, 2006](#); [Sy, Fong, Carter, Boehme, & Alpert, 2011](#)), and from parents' participation in students' academic decision-making processes (e.g., by attending school guidance programs with the student) ([Kim & Schneider, 2005](#)). Youth from lower SES may benefit more from motivational beliefs about the attainability of success compared with youth from higher SES, since they face greater challenges. Since motivational resources are most important when tasks are challenging ([Heckhausen, Wrosch, & Schulz, 2010](#)), and given that students from lower SES have greater difficulty completing university ([Sirin, 2005](#)), motivational resources related to beliefs about how success is attained may be more valuable for these youth.

These issues may be particularly important in the context of a relatively rigidly structured and differentiated secondary education system such as Germany's. In Germany, elementary school teachers make recommendations about whether their students should attend the top tier of high school (Gymnasium), middle tier (Realschule), or lower tier (Hauptschule) after 4th grade. Parents can help select the top tier of high-schools, which channels youth toward university, or lower two tiers of the general-level high-schools from which it is more difficult (although still possible) to attend university ([Buchmann & Dalton, 2002](#); [Pietsch & Stubbe, 2007](#)). Because SES is associated with the type of high-schools students attend, this educational tracking makes it more difficult to overcome socioeconomic disadvantages ([Maaz, Trautwein, Lüdtke, & Baumert, 2008](#)). However, more than one third of students in Germany's tertiary education system are attempting to complete higher levels of education than their parents ([OECD, 2014](#)), indicating that upward mobility is a goal to which many aspire.

## The present study

The present study seeks to extend our understanding of how youths' perceptions of their relationships with their parents are associated with their beliefs about how success is attained, their academic aspirations, and university completion several years later. Using a structural equation modeling framework, we build and examine a model as shown in Fig. 1, which measures cross-sectional pathways from youths' reports of parental relationships through their beliefs about how success is attained to their educational aspirations, and longitudinal associations with whether they complete a university degree by age 26.

Specifically, we hypothesize that youth who report parents to be warmer, more interested in, and involved in their academics will be more likely to believe that success is attained through merit (*Hypothesis 1a*), and less likely to believe that success is due to external factors (*Hypothesis 1b*) or dominance over others (*Hypothesis 1c*). Next, we expect that youth who believe that success is due to merit will report higher educational aspirations (*Hypothesis 2a*), while youth who believe that success is due to external factors will report lower educational aspirations (*Hypothesis 2b*). The belief that success is due to dominance could encourage youth to attain higher educational credentials in order to increase their status; it may also lead youth to perceive higher education as inaccessible and controlled by others who are more dominant. Therefore, we do not have predictions about dominance-related beliefs' associations with educational aspirations or achievement. Youths' reports of their relationships with their parents, beliefs about how success is attained, and educational aspirations are all measured at age 17, so *Hypotheses 1* and *2* are cross-sectional in nature. Finally, we expect that youth who report higher educational aspirations will be more likely to complete university degrees (*Hypothesis 3*) by age 26.

Next, we examine the degree to which more proximal stages of the model (i.e., beliefs about success) mediate the more distal stages (i.e., educational aspirations and achievement). Specifically, we expect that youths' reported relationships with their parents will have significant indirect effects on their educational aspirations via beliefs about causes of success (*Hypothesis 4a*) and on university completion via beliefs about causes of success and educational aspirations (*Hypothesis 4b*). Similarly, we expect there will be significant indirect effects of beliefs about causes of success on university completion via educational aspirations (*Hypothesis 4c*). Furthermore, a mediated model in which youths' perceptions of parent–child relationships are associated with beliefs about causes of success, which in turn are associated with educational aspirations, which finally are associated with university completion, will fit the data better than a model that also includes direct effects of parent–child relationships on educational aspirations and university completion, and of beliefs about success on university completion (*Hypothesis 4d*). Because university completion is measured until age 26 and other variables are measured only at age 17, *Hypotheses 4b* and *4c* test longitudinal effects, while *Hypothesis 4a* tests cross-sectional effects, and *Hypothesis 4d* measures cross-sectional and longitudinal effects.

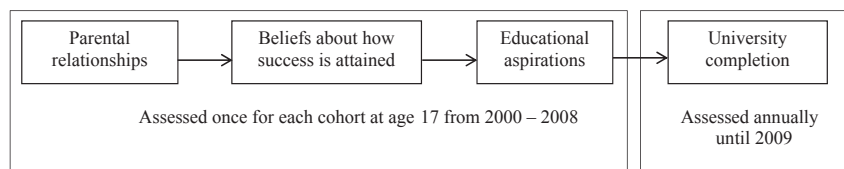
After construction of the model and examination of the mediated model, we will examine moderation of pathways by youths' parents' education levels. We expect that effects of youths' reports of their relationships with parents on university completion will be stronger if a parent completed a university degree (*Hypothesis 5a*), while the effects of beliefs about causes of success will be stronger among youth without a parent who completed a university degree (*Hypothesis 5b*).

## Method

### Sample

Data were drawn from the German Socioeconomic Panel (SOEP) Youth Questionnaires collected from each incoming cohort of 17-year-olds from 2000 to 2009, and these cohort's subsequent annual surveys from 2001 to 2009. Full details of the SOEP Youth Questionnaire sample and annual follow-up surveys can be found in the SOEP data documentation (Frick & Goebel, 2011). This sample includes a total of 3284 youth born between 1983 and 1992. Participants were selected if they were born into a household which included at least one member already in the SOEP panel. Households were initially selected through multi-step random sampling of East and West Germans, foreigners and immigrants, and high-income Germans. SOEP participation rates ranged from 40 to 70% depending on subsample.

After completing the youth survey, participants were entered into the SOEP longitudinal panel survey until 2009. Whether participants completed a university degree by 2009 (i.e., by age 26 for those who entered the panel in 2000; younger for those



**Fig. 1.** Hypothesized model by which youths' reports of parental relationships are associated with university completion through beliefs about success and educational aspirations. Participants in the 2000 cohort had 9 years of data; subsequent cohorts had fewer years of data.

who entered the panel later) is tracked via these subsequent annual surveys. The cross-sectional and longitudinal structure of this data is shown in Fig. 1. In total, 1948 (59.3%) of participants completed the survey in 2009; over 60% of participants completed the survey in all of the other years of data collection.

### Measures

**Parental warmth.** Youths' reports of their parents' warmth were gathered in the SOEP Youth Questionnaire at age 17. Participants were asked 18 items about the warmth they perceive within their relationships with their mothers and fathers (9 items that were repeated for mothers and for fathers). These included questions about youths' perceptions of how important their parents were to them, and the frequency with which they felt trusted by, loved, and valued by their mothers and fathers. Items asking the perceived importance of mothers and fathers were rated on a 4-point scale with 1 = *not important at all* and 4 = *very important*; all other items were rated on a 5-point scale with 1 = *never* and 5 = *very often*. All items were normally distributed (skewness and kurtosis < |1.8|). Kaiser-Meyer-Olkin test of sampling adequacy indicated a middling degree of common variance (.775), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ( $\chi^2 = 39,781.25$ ,  $p < .001$ ). Scores were standardized using a z-transformation and then averaged ( $\alpha = .91$ ).

**Parental involvement in academics.** Youths' reports of their parents' involvement in their academics was assessed in the SOEP Youth Questionnaire at age 17 by asking whether either or both parents met with teachers during or outside of office hours, helped youth study, were involved as parent representatives in youths' school, and attended parent evenings. This measure did not distinguish mothers from fathers. Items were coded such that 1 = *at least one parent was involved* and 0 = *neither parent was involved*. Scores were averaged across the 5 items. Visual inspection of scree plot and Eigen values from polychoric factor analysis used to analyze dichotomous variables indicated that these items fit well together.

**Parental interest in youths' academic performance.** Youths' reports of their parents' interest in their academic performance was measured in the SOEP Youth Questionnaire at age 17 with a single item "To what extent do or did your parents show interest in your grades and progress in school?" This measure did not distinguish mothers from fathers. Responses ranged from 1 = *very much* to 4 = *not at all*, and items were recoded so that higher values reflected greater interest in youths' academic performance. This item was normally distributed (skewness and kurtosis < |1.0|), and exploratory factor analysis indicates it should not be included with reports of parental warmth or involvement in academics (uniqueness > .72).

**Beliefs about success.** Youths' beliefs regarding how success is attained in German society were measured in the SOEP Youth Questionnaire at age 17. The belief that success is attained through merit was assessed with five items such as "success in German society is achieved by working hard," and "through initiative" (Sandberger, 1983). Items were scored from 1 = *agree completely* to 4 = *do not agree at all*, and were recoded so that higher scores reflect greater agreement. All items were normally distributed (skewness and kurtosis < |1.4|). Kaiser-Meyer-Olkin test of sampling adequacy indicated a middling degree of common variance (.745), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ( $\chi^2 = 1571.04$ ,  $p < .001$ ), so items were combined into a single scale by averaging them. Inter-item reliability was acceptable ( $\alpha = .63$ ).

Youths' belief that success in German society is attained through dominance over others was measured at age 17 with six items such as "Success in German society is attained through money" and "by being ruthless" (Sandberger, 1983). Items were scored from 1 = *agree completely* to 4 = *do not agree at all*, and were recoded so that higher scores reflect greater agreement. All items were normally distributed (skewness and kurtosis < |.9|). Kaiser-Meyer-Olkin test of sampling adequacy indicated a meritorious degree of common variance (.821), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ( $\chi^2 = 5068.00$ ,  $p < .001$ ), so items were combined into a single scale by averaging. Inter-item reliability was good ( $\alpha = .73$ ).

Youths' belief that success is due to external factors was measured at age 17 with 4 items such as "I often have the experience that others make decisions regarding my life," and "What one achieves in life is mainly a question of luck or fate" reflecting external locus of control beliefs (Richter, Metzger, Weinhardt, & Schupp, 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 to 2009. Scales were recoded so that higher scores reflect greater agreement and standardized using a z-transformation. All items were normally distributed (skewness and kurtosis < |1|). Kaiser-Meyer-Olkin test of sampling adequacy indicated a mediocre degree of common variance (.656), and Bartlett's test of sphericity indicated that items are significantly intercorrelated ( $X^2 = 942.94$ ,  $p < .001$ ), so items were combined into a single scale. Although inter-item reliability was low ( $\alpha = .55$ ), a visual inspection of the scree plot from a factor analysis indicated that a single factor was the best fit, and the conceptual similarity of the items suggested combining the items.

**Educational aspirations.** Youths' post-secondary aspirations were measured in the SOEP Youth Questionnaire at age 17. University aspirations were coded as 3, technical college or white collar job training was coded as 2, and apprenticeships or no aspirations were coded as 1.

**University completion.** Whether participants completed four-year university degrees was assessed using the last survey the participant completed up until 2009. For those who did not complete the 2009 survey, university completion status from the most recent annual survey completed was used.

**Demographic and other control variables.** Participants' gender, grades in high-school math and German classes (coded 1 through 6 such that high scores reflect better grades and averaged), the tier of high-school coded from 1 (lowest tier) to 3 (highest tier), and whether they lived at home were assessed in the SOEP Youth Questionnaire at age 17. Whether youth had a

parent who completed a university degree was gathered from the SOEP computed variables (SOEP Group, 2014). Demographics for the sample at age 17 and for those who completed the survey in 2009 are presented in Table 1.

### Statistical analyses

Maximum likelihood structural equation modeling (SEM) with missing values was used in Stata IC 13 (StataCorp, 2013). The first model examined cross-sectional associations between youths' reports of relationships with their parents and beliefs about success (Hypothesis 1), cross-sectional associations between beliefs about success and educational aspirations (Hypothesis 2), and longitudinal associations between educational aspirations and university completion (Hypothesis 3). Indirect effects (Hypothesis 4a-c) were calculated with this model.

A second model was run to assess mediation (Hypotheses 4d). In the second model, cross-sectional associations between each of the measures of youths' relationships with parents and educational aspirations and longitudinal associations with university completion were added, as well as longitudinal associations between beliefs about success and university completion. Model fit statistics for the two models were compared, and a  $\Delta \chi^2$  test was further used to determine whether the full model (Model 2) fit the data better than the mediated model (Model 1).

Moderation was tested by first holding all parameters equal then allowing structural coefficients to vary according to whether youth had a parent who completed a university degree (Hypothesis 5). Moderation was assessed by comparing  $\chi^2$  and model fit statistics between the constrained and the unconstrained models. Direct and indirect effects were compared by groups defined by whether youth had a parent who completed a university degree.

All analyses controlled for gender, youths' high-school type, grades in math and German, and whether participants lived at home at age 17. Analyses examining university degree completion also controlled for the oldest age at which university completion data is available. Parents' level of education was included as a covariate in analyses other than when moderation by parents' education was tested.

## Results

Descriptive statistics and inter-item correlations for the three aspects of youths' relationships with parents, beliefs about how success is attained, educational aspirations, and university achievement are presented in Table 2. Participants who completed the follow-up survey in 2009 perceived relationships with parents to be warmer and reported higher educational aspirations than participants from earlier cohorts ( $t_s > 3.65$ ,  $p_s < .05$ ), but did not differ significantly on other variables tested in the models.

### Model building

Hypothesis 1 examined whether youths' beliefs about success were associated with their self-reported relationships with their parents at age 17. Results are presented in Table 3. As predicted by Hypothesis 1a, youths' belief that success is due to merit was positively associated with their perceptions of parents' warmth ( $\beta = .065$ , 95% CI [.041, .090],  $p < .001$ ), and with their reports of parents' interest in their academics ( $\beta = .032$ , 95% CI [.012, .053],  $p = .002$ ). As predicted by Hypothesis 1b, youths' belief that success is due to external factors was negatively associated with their perceptions of parents' warmth ( $\beta = -.184$ , 95% CI [-.222, -.146],  $p < .001$ ), and marginally with their reports of parents' interest in their academics ( $\beta = -.032$ , 95% CI [-.064, .001],  $p = .054$ ). Finally, as predicted by Hypothesis 1c, youths' belief that success is due to

**Table 1**  
Demographic information of participants at age 17 and in final survey in 2009.

	Youth survey	2009
	n (%)	n (%)
Total	3284 (100)	1948 (59.3)
Age	17.1	21.1
(SD, range)	(.45, 16–18)	(2.89, 17–26)
Male	1668 (50.8)	1011 (51.9)
Father completed university	483 (16.8)	295 (17.3)
Mother completed university	360 (12.3)	228 (13.2)
Migration background		
Both parents born in Germany	2568 (78.2)	1556 (80.0)
One/both parent(s) born abroad	489 (14.9)	291 (15.0)
Participant born abroad	224 (6.8)	99 (5.1)
High school tier		
Top tier (Gymnasium)	1342 (42.3)	882 (46.5)
Middle tier (Realschule)	1439 (45.4)	805 (42.5)
Lowest tier (Hauptschule)	389 (12.3)	209 (11.0)
Completed university degree	0	346 (17.8)

**Table 2**

Descriptive statistics and correlations among parental relationships, beliefs about how success is achieved, educational aspirations, and university achievement.

	Mean (SD)	Parental relationships			Success due to			Educational aspirations
		Warmth	Interest	Involvement	Merit	Dominance	External factors	
Parental								
Warmth	-.01 (.64) <sup>a</sup>							
Interest	2.98 (.75)	.26***						
Involvement	.49 (.23)	.20***	.35***					
Success due to								
Merit	3.40 (.41)	.14***	.08***	.05**				
Dominance	2.19 (.56)	-.11***	-.06**	.01	.02			
External factors	.00 (.65) <sup>a</sup>	-.23***	-.08***	-.07***	-.15***	.25***		
Educational aspirations	2.30 (1.34)	.18***	-.05**	.04*	.10***	.03	-.17***	
University completion <sup>b</sup>	.11 (.31)	.08***	-.04*	-.01	.06***	.02	-.05**	.33***

Notes: *n* varies from 2703–3270 due to missing data. \**p* < .05, \*\**p* < .01, \*\*\**p* < .001. a. measures are comprised of standardized items to combine different scales. b. point biserial correlations are provided for university completion since it is measured as a dichotomous variable.

**Table 3**

Unstandardized coefficients from structural equation models predicting youths' parental relationships and beliefs about how success is attained.

	Parental relationships			Success due to		
	Warmth β [95% CI]	Interest β [95% CI]	Involvement β [95% CI]	Merit β [95% CI]	Dominance β [95% CI]	External factors β [95% CI]
Intercept (UM)	-.43 [-.66, -.19]***	3.88 [3.61, 4.15]***	.60 [.52, .68]***	3.05 [2.88, 3.21]***	2.49 [2.27, 2.72]***	.63 [.37, .90]***
Intercept (moderated)	-.36 [-.60, -.12]**	3.93 [3.64, 4.21]***	.60 [.51, .69]***	3.01 [2.84, 3.19]***	2.51 [2.27, 2.74]***	.71 [.43, .99]***
Parental						
Warmth (UM)	–	–	–	.07 [.04, .09]***	-.10 [-.13, -.06]***	-.18 [-.22, -.15]***
Low PE	–	–	–	.07 [.04, .10]***	-.10 [-.14, .07]***	-.20 [-.24, -.16]***
High PE	–	–	–	.06 [.00, .12]*	-.10 [-.18, -.02]*	-.11 [-.21, -.02]*
Interest (UM)	–	–	–	.03 [.01, .05]**	-.03 [-.06, -.00]*	-.03 [-.06, .00]†
Low PE	–	–	–	.03 [.01, .05]*	-.04 [-.07, -.01]**	-.04 [-.08, -.01]*
High PE	–	–	–	.04 [-.00, .08]†	.00 [-.06, .06]	-.03 [-.07, .07]
Involvement (UM)	–	–	–	.02 [-.05, .08]	.07 [-.02, .15]	-.04 [-.14, .06]
Low PE	–	–	–	.02 [-.05, .09]	.06 [-.04, .16]	-.05 [-.17, .07]
High PE	–	–	–	-.01 [-.15, .12]	.04 [-.15, .23]	-.03 [-.26, .19]
Female (UM)	.05 [.00, .09]*	-.06 [-.11, -.01]*	-.03 [-.04, -.01]**	.01 [-.02, .04]	-.14 [-.18, -.10]***	.05 [.00, .10]*
Low PE	.03 [-.02, .08]	-.06 [-.12, .00]†	-.03 [-.05, -.01]**	-.00 [-.04, .02]	-.15 [-.19, -.10]***	.03 [-.02, .08]
High PE	.13 [.03, .23]*	-.08 [-.20, .03]	-.01 [-.05, .03]	.08 [.01, .14]*	-.08 [-.17, .01]†	.10 [-.01, .20]†
High-school type (UM)	.15 [.11, .18]***	-.05 [-.09, -.01]*	.01 [-.00, .02]	.05 [.03, .07]***	.02 [-.01, .05]	-.11 [-.15, -.07]***
Low PE	.14 [.10, .17]***	-.05 [-.09, -.00]*	.01 [-.01, .02]	.05 [.02, .05]***	.02 [-.02, .05]	-.11 [-.14, -.07]***
High PE	.18 [.08, .28]***	-.05 [-.16, .07]	.02 [-.01, .06]	.09 [.02, .15]*	.03 [-.05, .12]	-.17 [-.26, -.06]**
Grades (UM)	.11 [.08, .14]***	-.04 [-.07, -.00]*	-.01 [-.02, .00]	.03 [.01, .04]**	.00 [-.02, .03]	-.06 [-.10, -.03]***
Low PE	.09 [.06, .12]***	-.04 [-.08, -.00]*	-.00 [-.02, .01]	.03 [.01, .05]**	.01 [-.02, .04]	-.07 [-.11, -.04]***
High PE	.15 [.09, .21]***	-.06 [-.13, .02]	-.03 [-.05, -.01]*	.01 [-.04, .05]	.00 [-.06, .06]	-.07 [-.13, .00]†
Living away from home (UM)	-.43 [-.61, -.25]***	-.53 [-.74, -.32]***	-.08 [-.15, -.02]*	.01 [-.10, .12]	-.12 [-.27, .03]	-.07 [-.25, .11]
Low PE	-.38 [-.56, -.19]***	-.57 [-.80, -.35]***	-.08 [-.15, -.01]*	.07 [-.05, .19]	-.07 [-.23, .10]	-.07 [-.26, .12]
High PE	-.85 [-1.23, -.47]***	-.48 [-.91, -.06]*	.01 [-.13, .14]	-.10 [-.36, .17]	-.28 [-.64, .08]	-.22 [-.66, .23]
Parent ed (UM)	.05 [-.01, .11]	.01 [-.08, .06]	.04 [.02, .07]***	-.01 [-.03, .01]	.03 [-.02, .08]	-.03 [-.09, .03]

Notes: †*p* < .10 \**p* < .05, \*\**p* < .01, \*\*\**p* < .001. Results are shown for the unmoderated model (UM) first; Low PE and High PE refers to the moderated model, with structural coefficients varying according to whether youth have a parent who completed a university degree (High PE) or not (Low PE).

dominance was negatively associated with their perceptions of parents' warmth ( $\beta = -.097$ , 95% CI [-.130, -.064],  $p < .001$ ), and with their reports of parents' interest in their academics ( $\beta = -.032$ , 95% CI [-.060, -.005],  $p = .022$ ). However, contrary to our predictions, youths' report of their parents' involvement in their academics was not associated with any of the beliefs about success ( $ps > .05$ ).

*Hypothesis 2* examined whether youths' beliefs about how success is attained were associated with their educational aspirations at age 17. Results are shown in [Table 4](#). Youths' belief that success is due to merit was positively associated with educational aspirations ( $\beta = .096$ , 95% CI [.007, .185],  $p = .035$ ), while the belief that success is due to external factors was negatively associated with educational aspirations ( $\beta = -.108$ , 95% CI [-.169, -.047],  $p = .001$ ), supporting *Hypotheses 2a* and *2b* respectively. However, youths' belief that success is due to dominance over others was not significantly associated with their academic aspirations ( $\beta = .037$ , 95% CI [-.031, .106],  $p > .05$ ). Finally, youths' educational aspirations at age 17 were positively associated with whether they completed university during the course of the study ( $\beta = .052$ , 95% CI [.042, .063],  $p < .001$ ), supporting *Hypothesis 3* (also shown in [Table 4](#)).

Mediation and indirect effects

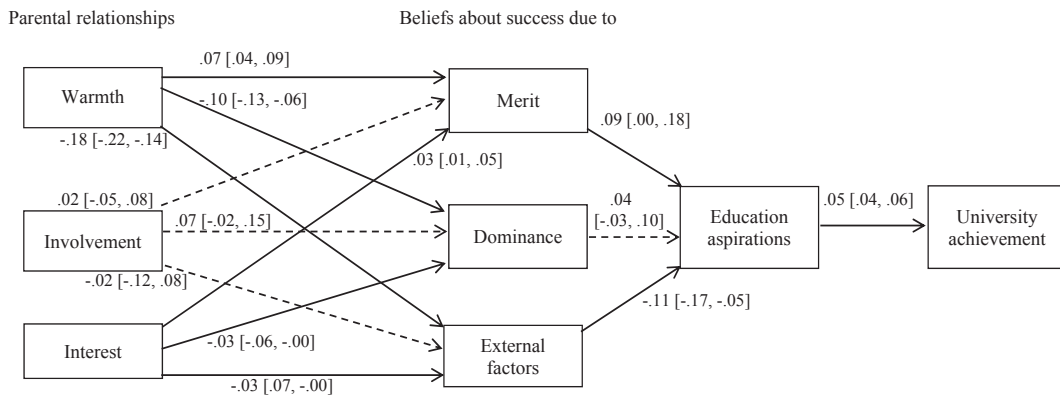
*Hypothesis 4* examined indirect effects of youths' perceptions of their relationships with their parents on their educational aspirations and university completion, and of beliefs of success on university completion. In the fully mediated model (displayed in Fig. 2 and shown in Table 4, Model 1), significant indirect effects were found such that reports of parental warmth ( $\beta = .022$ , 95% CI [.017, .027],  $p < .001$ ) and reports of parents' interest in youths' academics ( $\beta = .005$ , 95% CI [.001, .012],  $p = .009$ ) had small positive indirect effects on educational aspirations via youths' beliefs about success, supporting *Hypothesis 4a*. Supporting *Hypothesis 4b*, small significant indirect effects on university completion were found for youths' reports of parental warmth ( $\beta = .001$ , 95% CI [.001, .001],  $p < .001$ ) and reports of parents' interest in academics ( $\beta = .001$ , 95% CI [.000, .001],  $p = .012$ ). However, no indirect effects were found for youths' reports of parents' involvement in youths' academics on their educational aspirations or university completion ( $ps > .05$ ).

Additionally, there were small but significant positive indirect effects of youths' belief that success is attained through merit at age 17 on whether they eventually completed university via their educational aspirations at age 17 ( $\beta = .005$ , 95% CI [.000, .010],  $p = .035$ ), and significant negative indirect effects of youths' belief that success is due to external factors at age 17 on eventual university completion ( $\beta = -.005$ , 95% CI [-.009, -.002],  $p = .001$ ), supporting *Hypothesis 4c*. However, youths' beliefs that success is due to dominance at age 17 did not have significant indirect effects on eventual university completion ( $\beta = .002$ , 95% CI [-.002, .006],  $p > .05$ ).

**Table 4**  
Unstandardized coefficients from structural equation models predicting youths' educational aspirations and university achievement.

	Education aspirations		University achievement	
	Model 1 $\beta$ [95% CI]	Model 2 $\beta$ [95% CI]	Model 1 $\beta$ [95% CI]	Model 2 $\beta$ [95% CI]
Intercept (UM)	-1.60 [-2.09, -1.10]***	-1.46 [-1.99, -.92]***	42.65 [35.52, 49.77]***	42.49 [35.33, 49.65]***
Intercept (moderated)	-1.54 [-2.06, -1.03]***	-1.41 [-1.96, -.86]***	42.04 [34.86, 49.22]***	41.76 [34.55, 48.96]***
Parental				
Warmth (UM)	—	.04 [-.02, .10]	—	.01 [-.01, .03]
Low PE	—	.05 [-.02, .12]	—	-.00 [-.02, .01]
High PE	—	.05 [-.10, .02]	—	.06 [.02, .10]**
Interest (UM)	—	-.03 [-.08, .02]	—	-.00 [-.02, .01]
Low PE	—	-.03 [-.09, .02]	—	-.01 [-.02, .01]
High PE	—	.00 [-.10, .11]	—	.01 [-.02, .04]
Involvement (UM)	—	-.00 [-.16, .16]	—	-.03 [-.07, .01]
Low PE	—	.06 [-.13, .24]	—	-.01 [-.06, .04]
High PE	—	-.20 [-.55, .14]	—	-.11 [-.20, -.01]*
Success through				
Merit (UM)	.10 [.01, .19]*	.09 [.00, .18]*	—	.01 [-.01, .04]
Low PE	.10 [.00, .20]*	.09 [-.01, .19]†	—	.03 [-.00, .05]†
High PE	-.01 [-.20, .18]	-.01 [-.21, .18]	—	-.02 [-.07, .04]
Dominance (UM)	.04 [-.03, .11]	.04 [-.03, .11]	—	.01 [-.01, .02]
Low PE	.05 [-.02, .13]	.05 [-.02, .13]	—	.00 [-.02, .02]
High PE	.00 [-.15, .15]	.01 [-.14, .16]	—	.01 [-.03, .06]
External factors (UM)	-.11 [-.17, -.05]**	-.10 [-.16, -.04]**	—	.01 [-.01, .03]
Low PE	-.12 [-.19, -.05]**	-.11 [-.18, -.04]**	—	.00 [-.02, .02]
High PE	-.08 [-.23, .07]	-.08 [-.23, .06]	—	.03 [-.01, .07]
Education aspirations (UM)	—	—	.05 [.04, .06]***	.05 [.04, .06]***
Low PE	—	—	.05 [.04, .06]***	.05 [.04, .06]***
High PE	—	—	.04 [.01, .08]**	.04 [.01, .07]**
Female (UM)	.00 [-.08, .07]	-.01 [-.08, .06]	.01 [-.01, .03]	.01 [-.01, .03]
Low PE	-.02 [-.10, .06]	-.03 [-.11, .05]	.02 [-.00, .04]	.02 [-.01, .04]
High PE	.07 [-.09, .23]	.06 [-.10, .23]	-.01 [-.05, .04]	-.00 [-.05, .04]
High-school type (UM)	1.06 [1.00, 1.12]***	1.06 [1.00, 1.12]***	.04 [.02, .05]***	.04 [.02, .05]***
Low PE	1.02 [.96, 1.08]***	1.01 [.95, 1.08]***	.03 [.01, .05]**	.03 [.01, .05]**
High PE	1.41 [1.24, 1.58]***	1.41 [1.24, 1.58]***	.06 [-.00, .13]†	.07 [.00, .13]*
Grades (UM)	.24 [.19, .29]***	.23 [.19, .28]***	.04 [.02, .05]***	.04 [.02, .05]***
Low PE	.24 [.18, .29]***	.23 [.18, .29]***	.02 [.01, .04]**	.02 [.01, .04]**
High PE	.20 [.10, .30]***	.18 [.08, .29]***	.09 [.05, .12]***	.08 [.05, .11]***
Living away from home (UM)	-.10 [-.40, .20]	-.10 [-.40, .20]	-.03 [-.10, .05]	-.02 [-.10, .05]
Low PE	-.08 [-.40, .24]	-.08 [-.40, .24]	-.03 [-.11, .06]	-.04 [-.12, .05]
High PE	.11 [-.66, .88]	.16 [-.66, .98]	.06 [-.22, .35]	.13 [-.15, .42]
Years in panel (UM)	—	—	-.02 [-.03, -.02]***	-.02 [-.02, -.02]***
Low PE	—	—	-.02 [-.02, -.17]***	-.02 [-.02, -.02]***
High PE	—	—	-.02 [-.02, -.17]***	-.02 [-.02, -.02]***
Parent ed (UM)	.73 [.63, .82]***	.72 [.67, .82]***	.07 [.04, .10]***	.07 [.04, .10]***

Notes: † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model 1 is the mediated model; Model 2 is the full (unmediated) model. Results are shown for the unmoderated model (UM) first. Low PE and High PE refers to the moderated model, with structural coefficients varying according to whether youth have a parent who completed a university degree (High PE) or not (Low PE).



**Fig. 2.** Fully mediated model showing associations between reports of parental relationships, beliefs about success, educational aspirations and achievement. Note: Unmoderated  $\beta$  [95% CI] for the mediated path model (Model 1) are presented. Solid lines represent significant associations ( $p < .05$ ) and dashed lines represent non-significant associations ( $ps > .05$ ). Covariances between warmth, interest and involvement, and between merit, dominance and external factors are also included in this model (not shown). Youths' gender, parents' education, tier of high-school, grades, and living away from home at age 17 are covariates, predicting each of the measures. Number of years in the panel is also included as a covariate predicting university achievement. In the full model (Model 2), parental relationship measures also predict educational goals and achievement; beliefs about success also predict university achievement.

*Hypothesis 4d* compared the fit statistics between the mediated (Model 1) and the full model (Model 2). Both the mediated model [ $\chi^2(16, n = 3284) = 59.84$ , RMSEA = .029, CFI = .989, TLI = .950] and the full model [ $\chi^2(7, n = 3284) = 51.03$ , RMSEA = .044, CFI = .989, TLI = .885] fit the data well. The  $\Delta\chi^2$  between Model 1 and Model 2 is not significant [ $\chi^2(9) = 8.81$ ,  $p > .05$ ]. Given the improved model fit statistics and non-significant  $\Delta\chi^2$  test, and in the interest of parsimony, the fully mediated model was favored over the full model, supporting *Hypothesis 4d*.

#### Moderation by parents' level of education

*Hypothesis 5* examined moderation by whether youth had a parent who completed a university degree. To test for moderation, the model was run first holding structural and measurement coefficients and intercepts equal then run allowing the structural coefficients to vary according to whether youth had a parent who completed a university degree. The  $\Delta\chi^2$  test between the model holding structural and measurement coefficients and intercepts equal [ $\chi^2(111) = 1567.29$ ,  $p < .001$ ] and the model allowing structural coefficients to vary [ $\chi^2(56) = 1209.35$ ,  $p < .001$ ], was significant [ $\Delta\chi^2(55) = 357.94$ ,  $p < .001$ ], indicating that there are structural differences in the models depending on whether youth had a parent who completed a university degree.

Lagrange multiplier tests indicate that removing the constraint on the structural coefficients for the associations between each measure of the relationships with parents and youths' educational aspirations and university degree completion all improve the model fit [all  $\chi^2(1) > 7.76$ ,  $ps < .01$ ]. Additionally, removing the constraint on the structural coefficients on each of the associations between youths' belief about success and educational aspirations and on the associations between the belief that success is attained through merit and dominance on university degree completion also improved the model fit [all  $\chi^2(1) > 4.46$ ,  $ps < .05$ ]. This indicates significant differences in these pathways according to youths' parents' levels of education.

*Hypothesis 5a* predicted that youths' reports of their relationships with parents would be more strongly associated with educational aspirations and university completion among youth with a parent who completed a university degree. When structural coefficients are allowed to vary (shown in Table 4), reports of parents' warmth ( $\beta = .059$ , 95% CI [.015, .103],  $p = .008$ ) and involvement in academics ( $\beta = -.106$ , 95% CI [-.204, -.009],  $p = .032$ ) significantly predicted university completion among youth with a parent who completed a university degree. Reports of relationships with parents were not significantly associated with university degree completion among youth whose parents did not complete university degrees ( $ps > .05$ ). However, contrary to our predictions, parents' involvement was negatively, not positively associated with university completion. Educational aspirations were not significantly associated with any of the aspects of relationships with parents for either group of youth ( $ps > .05$ ), even though Lagrange multiplier tests indicate that moderation is present.

*Hypothesis 5b* predicted that beliefs about success would be more important among youth without a parent who completed a university degree. In support of this hypothesis, the belief that success is due to external factors ( $\beta = -.113$ , 95% CI [-.181, -.044],  $p = .001$ ) and due to merit ( $\beta = .093$ , 95% CI [-.007, .193],  $p = .070$ ) were associated with educational aspirations among youth whose parents did not complete a university degree. Beliefs about success were not associated with educational aspirations among youth with a parent who completed a university degree ( $ps > .10$ ). Additionally, youths' beliefs that success is attained through merit was marginally associated with university degree completion among youth whose parents did not complete university ( $\beta = .026$ , 95% CI [-.001, .053],  $p = .061$ ) and not among youth with a parent who completed a university degree ( $\beta = -.017$ , 95% CI [-.073, .040],  $p > .10$ ), shown in Table 4.



## Discussion

While prior research has demonstrated the importance of parent–child relationships for youths' academic goals and achievement (e.g., Pomerantz et al., 2007; Schoon & Parsons, 2002; Steinberg, Elmen, & Mounts, 1989), much less research has explored the mechanisms by which parent–child relationships have these effects. The importance of beliefs about the controllability of success for academic goal engagement and achievement has been shown (e.g., Eccles & Wigfield, 2002; Skinner et al., 1998), but the origins of these beliefs are not well understood. The present study is the first to connect these bodies of research. We show that at age 17, youths' relationships with their parents are associated with their beliefs about how success is attained. These beliefs are associated with youths' educational aspirations at age 17, and ultimately with university completion up to eight years later. We also find these associations vary by youths' parents' level of education. Collectively, the results suggest that one pathway by which youths' perceptions of their relationships with their parents are associated with their educational aspirations and long-term achievement is through youths' beliefs about how success is attained, but this pathway may differ depending on parents' levels of education.

### *Youths' reports of parental relations*

At age 17, youth who reported their parents to be warm and interested in their academics were more likely to believe that success is the result merit, whereas youth who reported that their parents lacked these traits were more likely to believe that success is due to external factors or dominance over others. Youth who see their parents as warmth and responsiveness may believe that the world is meritocratic because they extend their views of the fairness of their relationships to the world more generally (e.g., Dalbert & Radant, 2009). These findings are consistent with research showing that when parents are not supportive, youth feel they do not have the ability to achieve their goals and thus have less academic motivation (Legault, Green-Demers, & Pelletier, 2006).

Furthermore, youths' reports of parents' interest in their academics were positively associated with meritocratic beliefs and negatively with beliefs that success is due to dominance or external factors. Parents' interest in academics may highlight the value of hard work, thereby transmitting this value to the youth (e.g., Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001), whereas youth may not receive this message when see their parents to be uninterested in their academics. Interestingly, youths' reports of their parents' involvement in their academics were not associated with their beliefs about how success is attained. This is consistent with findings showing that parents' school-related behaviors are not as strongly related to academic achievement as the values and goals they have for their children (Fan & Chen, 2001). Parents may get involved for reasons unrelated to youths' academics (e.g., to demonstrate community involvement, due to feelings of obligation) which could lead to less coherent messages about the importance of school for their children. Thus, youths' perceptions of their parents' objective school-related behaviors (e.g., attending PTA meetings) may be less important than the more subjective quality of the parent–youth relationship and interest in their academics that youth perceive about their parents.

University completion was associated with previous reports of parental warmth (positively) and parents' involvement in academics (negatively) only among youth with a parent who completed a university degree. When the relationship is characterized by warmth, parents may be more inclined to help their children in their education. Even though youth in this study only reported on their relationships with their parents at age 17, young-adults' relationships with their parents are dependent on the relationships they had earlier in adolescence (Aquilino, 1997), indicating that these effects may extend beyond youths' high-school academics. Help may be more effective coming from parents who have completed a university degree since parents from higher SES are more effective in helping their children's education through their discussions with their children, involvement in their schools, monitoring, and educational support (Desimone, 1999; McNeal, 1999).

The negative association between youths' reports of parents' involvement in youths' academics at age 17 and university completion years later may reflect youths' struggles in high school and the parents' desire to help when children are struggling. Parents may be more inclined to get involved when youth are not on track to succeed in university. This off-track performance may lead parents to become involved, but also diminish youths' chances of university success, rather than the parents' involvement leading to lower chances of success. This result may be stronger when parents have university degrees because parents from higher SES have higher aspirations for their children (Schoon & Parsons, 2002), and may be less satisfied if their children are not on track to complete university. That is, parents who have completed university degrees may recognize when their children are not on track to complete university and become involved in an attempt to change their children's educational trajectory.

### *Beliefs about how success is attained, educational aspirations and achievement*

Youth who believed that success is due to merit reported higher educational aspirations, while youth who believed that success is due to external factors reported lower educational aspirations. Believing that success is controllable (i.e., due to one's own hard work and not due to external factors) likely promotes the belief that a specific goal (e.g., attaining a university degree) is also controllable, and in so doing leads to higher aspirations and motivational commitment (Rotter, 1966; Shane & Heckhausen, 2013, 2016; Weiner, 1985). Conversely, the belief that success is due to external factors conveys that the goal is uncontrollable, which in turn can be expected to lead to lower aspirations and disengagement (Shane & Heckhausen, 2013,

2016). These associations between beliefs about success and educational aspirations were stronger among youth without a parent who completed a university degree. Youth whose parents are less educated face greater challenges and are overall less likely to complete university compared to youth whose parents have more education (OECD, 2014). In the face of this greater challenge, youth whose parents did not complete university appear to benefit more from the motivational resources associated with believing that success is controllable and are more hindered by the belief that success is uncontrollable.

Youths' educational aspirations at age 17 were associated with actual university achievement up to eight years later. This finding is convergent with previous research illustrating the beneficial effect of educational aspirations on long-term post-secondary educational attainment (Heckhausen & Chang, 2009; Villarreal, Heckhausen, Lessard, Greenberger, & Chen, 2015), and extends these prior U.S. findings by showing similar relationships in a German sample. Higher aspirations likely encourage greater goal engagement, including investing more effort and time in pursuit of the goal, and thus can enable better achievements, even if lofty aspirations are not attained (Villarreal et al., 2015).

The belief that success in society is due to dominance over others was not associated with educational aspirations or university completion. Believing that success requires dominance over others may promote goal engagement when individuals believe that they are personally able to access these dominance paths, and promote goal disengagement when individuals feel that they do not have access to these paths. Dominance over others may also be less valuable for educational achievement than one's merit or hard work, since taking advantage of others may not lead to greater academic success in the same way that hard work does. However, the belief that success is due to dominance over others may be more relevant in domains of life that feature more competition with others (e.g., when seeking a job or promotion).

### Limitations

Youths' perceptions of their relationships with their parents, their beliefs about success, and their educational aspirations were all assessed at a single time at age 17; only university completion was assessed afterward. Therefore, these findings cannot identify the direction of the associations between the variables assessed at age 17, and would benefit from longitudinal research to determine how these processes unfold over time. Additionally, all measures in this study were from the youths' perspective, and most measures of the relationships were of perceptions of parents generally rather than of mothers separately from fathers. Measures of parent–child relationships that include items from the parents' perspective would provide a more complete picture, since parent- and child-reports of relationships are often not strongly correlated (Aquilino, 1999; Mandemakers & Dykstra, 2008). However, youths' perspectives are critical, and youths' interpretation of their parents' behavior may be a more important influence on youths' behavior than parents' perceptions of their own behavior (Steinberg, Lamborn, Dornbusch, & Darling, 1992). Including separate items for mothers' and fathers' involvement and interest would allow for an interesting gendered approach to the analysis which was unavailable from this data (e.g., identifying the relative importance of mothers compared to fathers and whether this depends on youths' gender).

Additionally, whether youth completed a university degree was the only objective outcome included in this research. Although completing university is important for economic success, this measure does not capture smaller differences in academic attainment (e.g., getting better grades or completing a more challenging degree). Finally, it is also important to consider the participants' context within the German education system. At age 17, parents likely have already had a significant impact on youths' educational trajectories, since Germany's educational tracking channels youth toward or away from university at the start of high-school. Therefore, it is important to expand this line of research to other societies and their educational systems.

### Conclusion

This research highlights the importance of youths' motivational beliefs when facing the challenge of attending and completing university, and the multiple roles that parents may play in their children's lives. For youth with a parent who completed a university degree, the relationships may serve as direct resources to model and advise them with attaining their baccalaureate degrees. For others, the benefit of their relationships with their parents for college success may be more about parents supporting their children's motivational beliefs about the achievability of success. The differing pathways by which parental relationships are associated with youths' educational attainment indicate that parents may have an impact on their children regardless of their own resources. Promoting parental warmth and interest in youths' academics may be beneficial for youth even if parents do not have experience in higher education, especially if they are fostering meritocratic beliefs about success in society.

### References

- Aquilino, W. S. (1997). From adolescent to young adult: A prospective study of parent-child relations during the transition to adulthood. *Journal of Marriage and Family*, 59(3), 670–686. <http://dx.doi.org/10.2307/353953>.
- Aquilino, W. S. (1999). Two views of one relationship: Comparing parents' and young adult children's reports of the quality of intergenerational relations. *Journal of Marriage and the Family*, 61(4), 858. <http://dx.doi.org/10.2307/354008>.
- Armstrong, A. (2012). Belief in a just world and children's cognitive scores. *National Institute Economic Review*, 222, R7–R19. <http://dx.doi.org/10.1177/002795011222200102>.

- Beal, S. J., & Crockett, L. J. (2010). Adolescents' occupational and educational aspirations and expectations: Links to high school activities and adult educational attainment. *Developmental Psychology*, 46(1), 258–265. <http://dx.doi.org/10.1037/a0017416>.
- Buchmann, C., & Dalton, B. (2002). Interpersonal influences and educational aspirations in 12 countries: The importance of institutional context. *Sociology of Education*, 75(2), 99–122. <http://dx.doi.org/10.2307/3090287>.
- Dalbert, C., & Radant, M. (2009). Parenting and young adolescents' belief in a just world. In C. Dalbert, & S. Hedvig (Eds.), *The justice motive in adolescence and young adulthood: Origins and consequences* (pp. 12–25). New York, NY: Routledge.
- Dalbert, C., & Stoerber, J. (2006). The personal belief in a just world and domain-specific beliefs about justice at school and in the family: A longitudinal study with adolescents. *Journal of Behavioral Development*, 30, 200–207. <http://dx.doi.org/10.1177/0165025406063638>.
- Desimone, L. (1999). Linking parent involvement with student achievement: Do race and income matter? *The Journal of Educational Research*, 93(1), 11–30. <http://dx.doi.org/10.1080/00220679909597625>.
- Eccles, J. S., & Roeser, R. W. (2009). Schools, academic motivation, and stage-environment fit. In R. M. Lerner, & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 404–434). New York: Wiley.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109–132. [v10.1146/annurev.psych.53.100901.135153](http://dx.doi.org/10.1146/annurev.psych.53.100901.135153).
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13(1), 1–22. <http://dx.doi.org/10.1023/A:1009048817385>.
- Frick, J. R., & Goebel, J. (2011). *Biography and life history data in the German socio economic panel (SOEP, v27, 1984–2010)*. Berlin. Retrieved from [www.diw.de](http://www.diw.de).
- Fulton, E., & Turner, L. A. (2008). Students' academic motivation: Relations with parental warmth, autonomy granting, and supervision. *Educational Psychology*, 28(5), 521–534. <http://dx.doi.org/10.1080/01443410701846119>.
- Gollwitzer, P. M. (2003). Why we thought that action mind-sets affect illusions of control. *Psychological Inquiry*, 14(3/4), 261–269. [http://dx.doi.org/10.1207/S15327965PLI1403&4\\_14](http://dx.doi.org/10.1207/S15327965PLI1403&4_14).
- Gollwitzer, P. M., & Kinney, R. F. (1989). Effects of deliberative and implemental mind-sets on illusion of control. *Journal of Personality and Social Psychology*, 56(4), 531–542. <http://dx.doi.org/10.1037/0022-3514.56.4.531>.
- Heckhausen, J., & Chang, E. S. (2009). Can ambition help overcome social inequality in the transition to adulthood? Individual agency and societal opportunities in Germany and the United States. *Research in Human Development*, 6(4), 235–251. <http://dx.doi.org/10.1080/15427600903281244>.
- Heckhausen, H., & Gollwitzer, P. M. (1987). Thought contents and cognitive functioning in motivational versus volitional states of mind. *Motivation and Emotion*, 11(2), 101–120. <http://dx.doi.org/10.1007/BF00992338>.
- Heckhausen, J., & Shane, J. (2016). Social mobility in the transition to adulthood: Educational systems, career entry, and individual agency. In L. A. Jensen (Ed.), *Action and self Development: Theory and research through the life-span* (pp. 535–553). New York: Oxford University Press.
- Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review*, 117(1), 1–53. <http://dx.doi.org/10.1037/a0017668.A>.
- Hill, N. E., Castellino, D. R., Lansford, J. E., Nowlin, P., Dodge, K. A., Bates, J. E., et al. (2004). Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*, 75(5), 1491–1509. <http://dx.doi.org/10.1111/j.1467-8624.2004.00753.x>.
- Jodl, K. M., Michael, A., Malanchuk, O., Eccles, J. S., & Sameroff, A. (2001). Parents' roles in shaping early adolescents' occupational aspirations. *Child Development*, 72(4), 1247–1265. <http://dx.doi.org/10.1111/1467-8624.00345>.
- Kim, D. H., & Schneider, B. (2005). Social capital in action: Alignment of parental support in adolescents' transition to postsecondary education. *Social Forces*, 84(2), 1181–1206. <http://dx.doi.org/10.1353/sof.2006.0012>.
- Laurin, K., Fitzsimons, G. M., & Kay, A. C. (2011). Social disadvantage and the self-regulatory function of justice beliefs. *Journal of Personality and Social Psychology*, 100, 149–171. <http://dx.doi.org/10.1037/a0021343>.
- Legault, L., Green-Demers, I., & Pelletier, L. (2006). Why do high school students lack motivation in the classroom? Toward an understanding of academic motivation and the role of social support. *Journal of Educational Psychology*, 98(3), 567–582. <http://dx.doi.org/10.1037/0022-0663.98.3.567>.
- Maaz, K., Trautwein, U., Lüdtke, O., & Baumert, J. (2008). Educational transitions and differential learning environments: How explicit between-school tracking contributes to social inequality in educational outcomes. *Child Development Perspectives*, 2(2), 99–106. <http://dx.doi.org/10.1111/j.1750-8606.2008.00048.x>.
- Malecki, C. K., & Demaray, M. K. (2006). Social support as a buffer in the relationship between socioeconomic status and academic performance. *School Psychology Quarterly*, 21(4), 375–395. <http://dx.doi.org/10.1037/h0084129>.
- Mandemakers, J. J., & Dykstra, P. A. (2008). Discrepancies in parent's and adult Child's reports of support and contact. *Journal of Marriage and Family*, 70(2), 495–506. <http://dx.doi.org/10.1111/j.1741-3737.2008.00496.x>.
- Marks, G. N. (2005). Cross-national differences and accounting for social class inequalities in education. *International Sociology*, 20, 483–505. <http://dx.doi.org/10.1177/0268580905058328>.
- McNeal, R. B. (1999). Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out. *Social Forces*, 78(1), 117–144. <http://dx.doi.org/10.2307/3005792>.
- Mirowsky, J., & Ross, C. E. (2007). Life course trajectories of perceived control and their relationship to education. *American Journal of Sociology*, 112(5), 1339–1382. <http://dx.doi.org/10.1086/511800>.
- Mortimer, J. T., Lorence, J., & Kumka, D. S. (1986). *Work, family, and personality: Transition to adulthood*. Norwood, NJ: Ablex Publishing Corporation.
- OECD. (2014). *Education at a glance 2014: OECD indicators*. OECD publishing. <http://dx.doi.org/10.1787/eag-2013-en>.
- Parke, R. D., & Buriel, R. (2006). Socialization in the family: Ethnic and ecological perspectives. In W. Damon, R. Lerner, & N. I. Eisenberger (Eds.), *Handbook of child psychology: Vol 3, social, emotional, and personality development* (6th ed., pp. 95–140). Hoboken, NJ: John Wiley & Sons, Inc.
- Perry, L. B., & McConney, A. (2010). Does the SES of the school matter? An examination of socioeconomic status and student achievement using PISA 2003. *Teachers College Record*, 112(4), 1137–1162.
- Pietsch, M., & Stubbe, T. C. (2007). Inequality in the transition from primary to secondary school: School choices and educational disparities in Germany. *European Educational Research Journal*, 6(4), 424–445. <http://dx.doi.org/10.2304/eej.2007.6.4.424>.
- Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research*, 77(3), 373–410. <http://dx.doi.org/10.3102/003465430305567>.
- Richter, D., Metzger, M., Weinhardt, M., & Schupp, J. (2013). SOEP scales manual. *SOEP Survey Papers*, 138. Retrieved from <http://www.econstor.eu/handle/10419/85279>.
- Roksa, J., & Potter, D. (2011). Parenting and academic achievement: Intergenerational transmission of educational advantage. *Sociology of Education*, 84, 299–321. doi:10.1177/0038040711417013.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1), 1–28.
- Sandberger, T. (1983). Zwischen Legitimation und Kritik. Vorstellungen von Akademikern, Studenten und Bevölkerung zur sozialen Ungleichheit [Between legitimacy and criticism. Ideas of academics, students and populations towards social inequality]. *Zeitschrift Für Soziologie*, 12, 181–202.
- Schoon, I. (2008). A transgenerational model of status attainment: The potential mediating role of school motivation and education. *National Institute Economic Review*, 205, 72–82. <http://dx.doi.org/10.1177/0027950108096590>.
- Schoon, I., & Parsons, S. (2002). Teenage aspirations for future careers and occupational outcomes. *Journal of Vocational Behavior*, 60(2), 262–288. <http://dx.doi.org/10.1006/jvbe.2001.1867>.
- Shane, J., & Heckhausen, J. (2013). University students' causal conceptions about social mobility: Diverging pathways for believers in personal merit and luck. *Journal of Vocational Behavior*, 82(1), 10–19. <http://dx.doi.org/10.1016/j.jvb.2012.08.003>.

- Shane, J., & Heckhausen, J. (2016). For better or worse: Young adults' opportunity beliefs and motivational self-regulation during career entry. *International Journal of Behavioral Development, 40*(2), 107–116. <http://dx.doi.org/10.1177/0165025415589389>.
- Shane, J., Heckhausen, J., Lessard, J., Chen, C., & Greenberger, E. (2012). Career-related goal pursuit among post-high school youth: Relations between personal control beliefs and control strivings. *Motivation and Emotion, 36*(2), 159–169. <http://dx.doi.org/10.1007/s11031-011-9245-6>.
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75*(3), 417–453. <http://dx.doi.org/10.3102/00346543075003417>.
- Skinner, E. A., Zimmer-Gembeck, M. J., Connell, J. P., Eccles, J. S., & Wellborn, J. G. (1998). Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development, 63*(2), i–231. <http://doi.org/10.2307/1166220>.
- SOEP Group. (2014). SOEP 2013 – Documentation of person-related status and generated variables in PGEN for SOEP v30. *SOEP Survey Papers, 252*.
- Spera, C. (2005). A review of the relationship among parenting practices, parenting styles, and adolescent school achievement. *Educational Psychology Review, 17*(2), 125–146. <http://dx.doi.org/10.1007/s10648-005-3950-1>.
- StataCorp. (2013). *Stata statistical software: Release 13*. College Station, TX: StataCorp LC.
- Steinberg, L., Elmen, J. D., & Mounts, N. S. (1989). Authoritative parenting, psychosocial maturity, and academic success among adolescents. *Child Development, 60*(6), 1424–1436. <http://dx.doi.org/10.1111/1467-8624.ep9772457>.
- Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed. *Child Development, 63*(5), 1266–1281. <http://dx.doi.org/10.2307/1131532>.
- Sy, S. R., Fong, K., Carter, R., Boehme, J., & Alpert, A. (2011). Parent support and stress among first-generation and continuing-generation female students during the transition to college. *Journal of College Student Retention: Research, Theory and Practice, 13*(3), 383–398. doi:0.2190/CS.13.3.g.
- Trusty, J. (1998). Family influences on educational expectations of late adolescents. *The Journal of Educational Research, 91*, 260–271. <http://dx.doi.org/10.1080/00220679809597553>. February 2015.
- Villarreal, B., Heckhausen, J., Lessard, J., Greenberger, E., & Chen, C. (2015). High-school seniors' college enrollment goals: Costs and benefits of ambitious expectations. *Journal of Adolescence, 45*, 327–340. <http://dx.doi.org/10.1016/j.adolescence.2015.08.0120140-1971/>.
- Vuolo, M., Mortimer, J. T., & Staff, J. (2014). Adolescent precursors of pathways from school to work. *Journal of Research on Adolescence, 24*(1), 145–162. <http://dx.doi.org/10.1111/jora.12038>.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548–573. <http://dx.doi.org/10.1037/0033-295X.92.4.548>.