Student Characteristics and Behaviors at Age 12 Predict Occupational Success 40 Years Later Over and Above Childhood IQ and Parental Socioeconomic Status

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Drawing on a 2-wave longitudinal sample spanning 40 years from childhood (age 12) to middle adulthood (age 52), the present study was designed to examine how student characteristics and behaviors in late childhood (assessed in Wave 1 in 1968) predict career success in adulthood (assessed in Wave 2 in 2008). We examined the influence of parental socioeconomic status (SES), childhood intelligence, and student characteristics and behaviors (inattentiveness, school entitlement, responsible student, sense of inferiority, impatience, pessimism, rule breaking and defiance of parental authority, and teacher-rated studiousness) on 2 important real-life outcomes (i.e., occupational success and income). The longitudinal sample consisted of $N = 745$ persons who participated in 1968 ($M = 11.9$ years, $SD = 0.6$; 49.9% female) and 2008 ($M = 51.8$ years, $SD = 0.6$; 53.3% female). Regression analyses and path analyses were conducted to evaluate the direct and indirect effects (via education) of the predictors on career success. The results revealed direct and indirect influences of student characteristics (responsible student, rule breaking and defiance of parental authority, and teacher-rated studiousness) across the life span on career success after adjusting for differences in parental SES and IQ at age 12.

Keywords: student characteristics and behaviors, childhood personality, teacher rating, longitudinal MAGRIP study, career success and income

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Parents and teachers spend countless hours discussing, worrying about, and working on how their children approach schoolwork. Students themselves often share the same concerns and thoughts about how their actions at school might affect their future. Are any of these concerns well founded? Obviously, one can make the case that how students perform in school, at least in terms of their overall grades, will have some concrete ramifications for their near future, such as whether they get into college. However, what about other qualities that students have? Does it matter if they have a

good attitude in school? Does it matter whether they work hard as a student or suffer from debilitating anxiety when faced with tests and challenges? Recently, scientists have argued that educational systems should pay more attention to the soft skills (or social-emotional skills) students learn, under the assumption that these skills might help them succeed later in life (Tough, 2012). Unfortunately, there have been very few opportunities to investigate whether students' behaviors and thoughts about school have any lasting effects on their lifetime accomplishments.

In the current study, we used a unique data set to address these questions. Specifically, we used data from the Luxembourgish MAGRIP study. The original sample included more than 2,800 students from the 6th grade, representing half of the student population of this age in Luxembourg in 1968 at the time of the assessment. The initial assessment took place in primary school before the selection process had begun to direct students into different school tracks. It included measures of intelligence, educational aspirations, socioeconomic status (SES), family background, and a questionnaire on students' school-related and everyday feelings, thoughts, and habits. The items covered either school-related (e.g., "If I am interrupted while doing my homework, I still try hard to do it properly") or nonschool-related contexts (e.g., "Life is usually hard; only sometimes is it nice"). Moreover, the teachers were asked to rate their students on studiousness because teachers tend to be a valid source of information with regard to studiousness and willingness to learn. Recently, the MAGRIP sample was tracked down and followed up, and researchers collected basic information on the targets' lifetime educational and occupational achievements. Thus, we had a unique opportunity to ask about the extent to which it really matters how someone acted and thought in school. To evaluate the relevance of such constructs across the life span, we related them to important later life outcomes, namely, status and occupational achievement while controlling for other important childhood information (IQ and parental SES). The associations between childhood IQ, parental SES, and income that are present in the MAGRIP sample have been previously reported (Fischbach, Baudson, Preckel, Martin, & Brunner, 2013). These analyses were conducted before the data on the childhood characteristics had been analyzed. The present article is the first investigation to use the childhood student characteristics and the teachers' ratings of studiousness.

Theoretical Models of Status Attainment

To better understand the effects of student characteristics and behaviors on status attainment, as well as their interplay with other predictors and their relations to life outcomes, we considered different theoretical perspectives, which can be split into (a) sociological and (b) psychological approaches.

In sociological approaches, the main focus has been on the effects of parental SES on students' academic achievement, educational attainment, and occupational success. For example, Boudon (1974) introduced the distinction between primary and secondary influences of family SES to explain differences in educational outcomes. In his model, primary influences are those factors that affect educational attainment indirectly, through their impact on educational competences, whereas secondary influences are those factors that have a direct impact on educational attainment.

Moreover, sociological theories of status attainment also include human resources (i.e., capital) that play a role in addition to social resources such as SES (see Coleman, 1988). Most of these theories can be traced back to Blau and Duncan (1967) who assumed that after controlling for direct and indirect influences of parental SES, the most important form of human capital was educational achievement (and prior occupational status). Although most of these theoretical models focus on social capital (e.g., SES) as a predictor of higher occupational attainment, they tend to provide only a limited inclusion of psychological factors that might explain status and occupational attainment.

Psychological approaches aim at adding individual difference variables, such as general cognitive ability, personality, and motivational variables, to the prediction of occupational outcomes, and testing their incremental validity above and beyond SES (e.g., Damian et al., 2014). We will present three models that provide a broad and integrative view on the relation of the different sets of predictors: (a) the Eccles expectancy-value model (see Eccles, Wigfield, & Schiefele, 1998), (b) the Wisconsin model (Sewell, Haller, & Portes, 1969), and (c) the Credé and Kuncel model of academic performance (Credé & Kuncel, 2008).

The Eccles expectancy-value model is a broad model that links psychological and social factors to predict educational, vocational, and other achievement-related choices and activities. The Eccles model is one of the most comprehensive models and includes a broad range of factors, such as cultural norms, experiences, aptitudes, socializers' influences, personal expectations, beliefs, and attitudes in the prediction of expectations (Eccles, 2005). Although the focus of this model is to understand the development of expectations (such as self-concept and task value; e.g., Eccles & Wigfield, 2002), the model highlights general pathways that might help identify possible predictors of educational and occupational success. The model has two basic components, a psychological and a socialization component: Expectations and beliefs (psychological factors) as well as beliefs and behaviors of parents, teachers, and peers, and parental SES (social factors).

The Wisconsin model of status attainment is a psychological model of how parental SES is linked to occupational outcomes via educational attainment, aspirations, academic performance, general cognitive ability, and the role of significant others (Sewell et al., 1969). One critical feature of the Wisconsin model of status attainment is the assumption that educational attainment, aspirations, and general cognitive ability have direct effects on later occupational status. However, the Wisconsin model omits other psychological dimensions such as personality traits or student characteristics, behaviors, and attitudes.

In a more recent approach, Credé and Kuncel (2008) proposed an academic performance model that builds on the Wisconsin status attainment model by incorporating a variety of predictors of performance. They introduced student characteristics as important predictors of academic success in addition to general cognitive ability, prior and actual knowledge, personality, and motivation. Moreover, they showed that student characteristics could be subsumed under three broad domains: study habits, skills, and attitudes. The Credé and Kuncel model, although more inclusive with regard to possible predictors, is not as encompassing in its scope with regard to the outcomes, such as educational and occupational attainment. Although the Credé and Kuncel model did not include occupational attainment as an outcome, it is reasonable to assume that the predictors that are relevant for educational attainment would also be relevant for occupational attainment, given that education is one of the strongest predictors of career success.

Each of these theories provides different sets of predictors and focuses on different developmental periods and outcomes of the process. The sociological and Eccles models both focus on educational attainment as a primary outcome and stepping stone for

later occupational attainment. The Credé and Kuncel model, despite being focused primarily on children and teens, may be equally applicable to adults. Based on these models, we would assume that family background and cognitive predictors should have their largest effect on early adulthood educational attainment. Less is known about the long-term predictors of occupational success, but prior work in personality psychology has focused on personality traits as potential predictors of success throughout adulthood (e.g., Roberts et al., 2007). Moreover, psychological models, like Credé and Kuncel's hold that both personality and intelligence are largely independent of family background in their effects on occupational outcomes. Therefore, we expect personality-related variables and cognitive ability to play multiple roles in both educational attainment, which occurs primarily in young adulthood, and in occupational attainment across the life course. Inspired by the different theoretical approaches we adapted a comprehensive set of factors that should predict outcomes both in the short and long run.

Still, little is known about the mechanisms through which job performance and career success are determined by cognitive (e.g., intelligence) and noncognitive predictors (e.g., student characteristics) as well as socioeconomic family background. Credé and Kuncel (2008) as well as Sewell and colleagues (1969) assumed indirect paths in their models. Especially in a longitudinal study, possible mediating variables might be able to explain the mechanisms in a little more detail, most prominently educational attainment (see Shanahan, Hill, Roberts, Eccles, & Friedman, 2014). Ending up with a good job or high income depends on successful attainment of the previous step. Educational attainment, which is an important determinant for entering the job market, can therefore, be seen as the most important gateway into the job market. This can be understood as a process of cumulative advantage (see DiPrete & Eirich, 2006): having good education leads to better jobs. Therefore, it seems reasonable to treat educational attainment as a mediator. We know from previous research that SES, general cognitive ability, and personality predict academic success and educational attainment (see Poropat, 2009; Spengler, Lüdtke, Martin, & Brunner, 2013). Accordingly, in addition to the direct influences of SES, general cognitive ability, and student characteristics on life outcomes, we might expect an indirect pathway for each of our predictors via education. Therefore, it is important to use a multidetermined approach to explain career success.

Longitudinal Studies of Career Success

The goal of uncovering the long-term predictors of career success is highly relevant to several academic fields, such as psychology, education, sociology, and economics (see Almlund, Duckworth, Heckman, & Kautz, 2011; Blossfeld, Roβbach, & von Maurice, 2011; Heckman, 2006). Previous studies investigating predictors of occupational success, as measured by high SES or a good income, have focused on cognitive predictors such as intelligence (Gottfredson, 2002; Heckman, 2006; Kuncel, Hezlett, & Ones, 2004; Schmidt & Hunter, 2004). Other studies have focused on the roles of SES and prestige in predicting future achievement and occupational success (Bradley & Corwyn, 2002; Caro, Cortina, & Eccles, 2014; Heckman, Stixrud, & Urzua, 2006; Schnabel, Alfeld, Eccles, Köller, & Baumert, 2002). Finally, some studies

have focused on the role of education as a predictor of career success (e.g., Heckman, 2006).

In recent decades, researchers have investigated a broad array of determinants of academic and educational success. Such determinants can also be used as a basis for the identification of predictors of career success because most variables probably overlap between the two outcomes. Furthermore, educational success is one of the most important predictors of career success.

To understand the determinants of career success, it is essential to conduct longitudinal investigations of the relations between individual differences and occupational outcomes. As the main focus of the current investigation was to elaborate on the influences of childhood characteristics on later occupational success, we focused the literature review on prospective longitudinal studies that included noncognitive predictors measured early in life.

Viinikainen, Kokko, Pulkkinen, and Pehkonen (2010) drew on the Jyväskylä Longitudinal Study of Personality and Social Development (JYLS; $N = 243$) in which four dimensions of childhood characteristics were assessed via teacher ratings and peer nominations: Extraversion, inattentiveness, aggression, and constructiveness. Constructiveness (active and well-controlled social behavior) assessed at age 8 had a positive association with income at age 43 (a 1 SD increase in constructiveness was related to a 10% increase in income). Those results remained even after controlling for education, sex, and work-related information.

Similarly, childhood personality traits were shown to predict academic attainment and work competence (Shiner, Masten, & Roberts, 2003). In a sample of children between the ages of 8 and 12 ($N = 205$), academic conscientiousness, agreeableness, surgency, and mastery motivation were assessed by a combination of teacher reports, self-reports, and parent reports. After controlling for gender, academic competence, and childhood IQ, academic conscientiousness and agreeableness still had small but significant effects on academic attainment and work competence 20 years later.

Judge and colleagues (Judge, Higgins, Thoresen, & Barrick, 1999) related child and adult personality to intrinsic and extrinsic career success in middle age ($N = 116$ to 118). Adolescent personality ratings were made at ages 12 to 14 and 15 to 18 and were based on different resources (observational data; interviews with participants, teacher, and parents). Childhood Neuroticism was found to be negatively related and childhood Extraversion to be positively related to extrinsic career success (occupational status and income). Conscientiousness was associated with both intrinsic and extrinsic outcomes. The personality factors predicted career success over and above general cognitive abilities.

Recently, and relevant to the focus on school behaviors, Lleras (2008) investigated the contribution of noncognitive factors in predicting educational attainment and income. Cognitive abilities, work habits, social skills and behaviors, and family background were assessed in a cohort of 10th graders. In predicting income 10 years later, work habits, social skills, and participation in extracurricular activities predicted educational attainment and income after controlling for general cognitive abilities ($N = 7,656$).

In summary, existing research has indicated that childhood characteristics should be related to adult achievements, though few studies have focused on school-related behaviors. Furthermore, no research to date has linked school-related behaviors to educational and occupational outcomes across a long period of the adult life

course such as the one we had available in the MAGRIP study. Moreover, most studies have relied on only small or moderate sample sizes.

The Present Investigation

Because MAGRIP used a unique set of questions to assess student characteristics and behaviors in adolescence, and because no documentation of these measures was archived, the assessment framework that was behind the student questionnaire from 1968 had to be reconstructed. Therefore, as a first step, we examined both the factor structure of the item set in the original MAGRIP sample as well as in a sample of students assessed recently. This initial step provides critical information about the meaning of the measures administered at that time. We first identified the structure underlying the survey items, we then examined the nomological network of correlations linked to these student characteristics and behaviors in an attempt to better understand how they might be related to later educational and occupational outcomes. Detailed information about the development and validity of the scales can be found in the online Supplementary Material.

In the second step, we used the dimensions identified in the first step to predict educational attainment, occupational attainment, and income several decades after the original assessment of student characteristics. In this latter step, we included variables common to the occupational attainment models described above, such as cognitive ability and childhood SES.

The comprehensive set of predictors allowed us to test multiple factors drawn from sociological, educational, and psychological models reviewed above. For example, we used family background (SES) as a primary predictor, which is consistent with sociological models. We also included psychological variables that were consistent with both personality and educational models, such as the Eccles model. We also included teacher ratings of studiousness, which provides an approximation of Eccles "social factors."

On the basis of the results from previous longitudinal studies as outlined above, we expected childhood IQ, parental SES, educational attainment, and the student characteristics and behaviors to independently predict occupational success and income. Also consistent with prior work predicting occupational attainment, we tested educational attainment as a potential mediator of childhood factors when predicting adult work outcomes. Based on the theoretical models we would expect that childhood IQ and parental SES will have both significant direct and significant indirect paths. Concerning our student characteristics, this is the first study that investigated direct and indirect paths in one model. Therefore, we have no explicit expectations about the significance of the direct and indirect paths.

Method

Participants

The present investigation capitalized on longitudinal data from the Luxembourgish MAGRIP study (Brunner & Martin, 2011), which used a prospective epidemiological cohort design spanning 40 years, from 1968 (Wave 1) to 2008 (Wave 2). The multistage sampling procedure is described in detail in the online Supplemen-

tary Material (Figure 1). A random stratified representative subsample, which was stratified by region of residence in 1968 and gender, from Wave 1 participated in the second wave ($N = 745$; $M = 51.8$ years of age, $SD = 0.6$; 53.3% female) in 2008. In 1968, data on student characteristics, cognitive ability, and family background were collected from about half of the Luxembourgish student population at the end of primary school when most children were in the 6th grade ($N = 2,824$; $M = 11.9$ years of age, $SD = 0.6$; 49.9% female). In Grade 6 students were still in primary school. The selection process into different secondary school tracks took place after Grade 6 in Luxembourg.

Analyses were computed on data from the participants for whom complete data for both waves were available. We excluded participants when they had missing values on the outcome variables. This resulted in a final sample of $N = 730$ participants for the analyses on occupational success and $N = 575$ participants for the analyses on income.

Analyses concerning selection bias showed that the sample at Wave 2 was fairly representative of the original sample. Relative to the total 1968 sample, participants had slightly higher mean childhood general cognitive ability (Cohen's $d = 0.20$) and childhood SES ($d = 0.08$). With respect to the seven scales of the MAGRIP personality scales (MPS), the four largest mean differences relative to the total 1968 sample were observed for pessimism ($d = -0.15$), sense of inferiority ($d = -0.11$), school entitlement ($d = -0.08$), and the responsible student scale ($d = 0.08$) with negative values indicating that persons participating in both waves of measurement had lower levels on these scales. Although statistically significant, the magnitudes of the differences were quite small.

Measures

Childhood student characteristics and behaviors. Students completed the MPS, which is a questionnaire that includes a large set of items concerning the students' feelings, thoughts, and habits toward their school and everyday lives. The questionnaire consists of 108 items with a dichotomous answer format for which students have to decide whether the item is true for them or not. We divided the sample into school- and nonschool-related items and conducted two sets of exploratory factor analyses (EFA) with oblique rotations for each set of variables. Four school-related and three nonschool-related scales were extracted: inattentiveness, school entitlement, responsible student, sense of inferiority, impatience, pessimism, and rule breaking and defiance of parental authority. The validation of the scales and the items can be found in detail in the online Supplementary Material.

School entitlement describes the demands that students make of their teachers or their expectations of school in general (e.g., "Students' wishes should always be fulfilled"). The responsible student can be summarized as industrious and achievement-striving (e.g., "I usually try hard to do my homework very accurately and carefully"). The sense of inferiority scale includes items such as "If an exercise is very difficult, I give up more easily than my classmates," and depicts the students' (mainly upward) social comparisons in school contexts. Impatience covers behaviors related to impatience (e.g., "I run out of patience quickly"). Pessimism includes items that describe stu-

dents' negative and depressed view of the world (e.g., "I am usually sad; I am happy only sometimes"). Rule breaking and defiance of parental authority encompasses items that demonstrate a low level of rule orientation (e.g., "I have talked back to my mother before").

Childhood studiousness (teacher rating). Teachers' ratings of students' studiousness at age 12 were assessed by a single item on which teachers rated their students according to the students' studiousness. Teachers responded using a 5-point rating scale (1 = *very low*, 2 = *low*, 3 = *average*, 4 = *high*, and 5 = *very high*).

Childhood intelligence. In 1968, intelligence was assessed by 14 subtests of the "Leistungsprüfsystem" (L-P-S [Performance test system]; Horn, 1962, 1983). The L-P-S is a standardized German intelligence test battery that builds on Thurstone's (1938) model of primary mental abilities. Its total score correlates .94 with the total score of the German version of the Wechsler Adult Intelligence Scale (Sturm & Büssing, 1982). Each subtest contains 40 items and has to be completed within strict time constraints as specified in the test manual. The L-P-S subtests were averaged to create a single IQ score, which was z-standardized (α = .86).

Parental SES in childhood. Parental SES was assessed by obtaining children's descriptions of their parents' occupations. These occupations were mapped onto the categories of the International Standard Classification of Occupations (ISCO-88; Elias, 1997). For the present study, occupations were transformed using the International Socio-Economic Index of occupational status (ISEI; Ganzeboom, De Graaf, & Treiman, 1992). The ISEIs theoretical range spans from 16 (farm hands, laborers, helpers, and cleaners) to 90 (judges), with higher ISEI values indicating higher SES. In the present study, the highest ISEI value in a family (usually the father's ISEI value) was used. Interrater reliability of this ISEI coding was tested for two independent groups of raters and was satisfactory (.72).

Educational attainment. Educational attainment was operationalized as the number of school years attended after Grade 6. To make sure that the variable reflected actual exposure to educational opportunities rather than time spent in a classroom, repeated grades were counted only once.

Occupational success. Participants' current or most recent occupation (when participants were unemployment at follow-up) served as a measure of occupational success. Occupations were again mapped onto the ISCO code and then transformed into the ISEI (Ganzeboom et al., 1992). Higher values indicate higher occupational prestige and SES.

Income. Individual income was assessed with a scale ranging from less than 150 Euro to 10,000 Euro or more per month. Participants were presented with 14 income ranges and had to indicate which range indicated their individual income per month. For the present analyses, each range was recoded to the midpoint of the range. For instance, if participants indicated that their income was between 1,000 Euro and 1,499 Euro, their income was recoded to 1,225 Euro. For analyses that involved income, we included only participants with a valid individual income >0 Euro. Mean income was 5,814 Euro per month for men and 5,168 Euro per month for women. Therefore, individual income was centered on the mean for males or females to account for mean differences between the two sexes before the analyses.

Analyses

To provide a full picture of the relations between childhood characteristics, educational attainment, and occupational success, we specified several sets of regression models and two saturated path models that included mediation via educational attainment.

We began our statistical analyses by investigating a set of regression models to test the incremental validity of the MPS scales and the teachers' ratings of studiousness on occupational status and income, respectively. To this end, Model Set A included only IQ and SES, Model Set B additionally included years of education (over and above Model Set A), and Model Set C additionally included the MPS scales and the teachers' ratings of studiousness (over and above Model Set B).

Further, we investigated two path models that included all of the predictors from the regression analyses (i.e., the predictor variables included in regression Model Set C) and occupational status and income as central outcome variables, respectively. In addition, we specified years of education as a mediator between all other predictors and the outcome variable to test whether educational attainment mediated the effects of our predictors on career success. Therefore, every predictor (MPS scales, teacher ratings, IQ, and SES) was allowed to have both a direct and an indirect (via years of education) path to the outcome variables. Parameters in both model sets were estimated using Mplus (Muthén & Muthén, 1998-2012). The percentage of missing data that were included in the two path models was less than 5% for each variable, respectively. Hence, missing data were unlikely to be a critical problem. We used the full information maximum likelihood approach (maximum likelihood estimation with robust *SE*s; MLR) to obtain parameter estimates and *SE*s that accounted for the missing data (and that were also robust to the nonnormality of the data).

To evaluate the direct and indirect effects of the predictors, we ran a mediation (path) analysis. In such a model, the total effect of a predictor variable on an outcome variable can be decomposed into a direct and an indirect or mediated effect. The latter effect represents an effect that is transmitted via one (or more) mediator(s). We computed bias-corrected bootstrap confidence intervals for the model parameter estimates to assess the significance of the direct, indirect, and total effects of the predictors on the outcomes. This method accounts for the expected nonnormality of the sampling distribution of the mediation effect (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In addition, we computed the proportion of the total effect of the three predictors that were mediated by educational attainment as a measure of effect size (cf. Kelley & Preacher, 2012).

For industriousness, we were able to provide a multimethod approach that included the self- and teacher reports. Both modalities were thought to have the potential to predict the long-term outcomes.

Results

First, we tested whether students' characteristics and behaviors were related to career outcomes. Table 1 shows the means, *SD*s, and correlations of the constructs under investigation. School entitlement, sense of inferiority, and pessimism measured in childhood were significantly negatively correlated with the outcome variables 40 years later (education, occupational success, and individual income). The responsible student scale measured in

Table 1

Descriptive Statistics for and Bivariate Correlations Between Study Variables

	M	*SD*	α	2	3	4	5	6	7	8	9	10	11	12	13
1. Inattentiveness	.64	.29	.77	**.26**	−.22	**.31**	**.60**	**.16**	**.65**	.03	.05	−.04	.00	.03	.06
2. School entitlement	.39	.23	.71		−.17	**.40**	**.33**	**.54**	.12	−.28	−.22	−.18	−.21	−.21	−.15
3. Responsible student	.83	.14	.57			−.18	−.16	−.03	−.16	.18	.13	.03	.10	**.16**	.12
4. Sense of inferiority	.44	.25	.60				**.41**	**.50**	.19	−.35	−.28	−.15	−.26	−.27	−.17
5. Impatience	.51	.35	.51					**.31**	**.37**	−.08	−.07	−.07	−.06	−.06	−.06
6. Pessimism	.39	.24	.67						.06	−.34	−.30	−.17	−.26	−.26	−.17
7. Rule breaking and defiance	.56	.35	.68							.13	.08	.00	.08	.07	**.14**
8. Studiousness (teacher ratings)	3.6	1.01	—								**.41**	**.28**	**.41**	**.40**	**.29**
9. IQ	.00	1.00	—									**.24**	**.39**	**.37**	**.34**
10. Parental SES	40.14	12.65	—										**.41**	**.33**	**.21**
11. Years of education	5.83	3.46	—											**.56**	**.47**
12. Occupational status	46.52	14.59	—												**.55**
13. Individual income	3,134.65	2,337.09	—												

Note. SES = socioeconomic status (at Time 1); occupational status was coded as the International Socioeconomic Index of Occupational Status. Individual income was mean-centered for males and females at age 52. Characters in bold indicate significant correlations ($p < .01$).

childhood was significantly positively correlated with occupational success and individual income. Rule breaking and defiance of parental authority was positively correlated with income only. Specifically, the more responsible and industrious students reported finding more prestigious jobs and earning higher incomes irrespective of whether childhood characteristics and behaviors were measured by self-report (occupational success: $r = .16$; income: $r = .12$) or teacher reports (occupational success: $r = .40$; income: $r = .29$). Moreover, teacher-rated studiousness was positively related to educational attainment (education: $r = .41$). School entitlement, sense of inferiority, and pessimism were negatively related to educational attainment ($r = −.21$ to $r = −.26$), occupational success ($r = −.21$ to $r = −.27$), and income ($r = −.15$ to $r = −.17$). Moreover, childhood intelligence was also significantly related to the outcomes (educational attainment: $r = .39$; occupational success: $r = .37$; income: $r = .34$). Similarly, parental SES was significantly correlated with the outcomes (educational attainment: $r = .41$; occupational success: $r = .33$; income: $r = .21$). Furthermore, educational attainment was significantly associated with occupational success ($r = .56$) and income ($r = .47$). These correlations provided the basis for the subsequent analyses. Overall, the correlational pattern showed that most of the student scales were related to educational attainment, occupational success, and income.

Second, we tested the incremental validity of each MPS scale and teachers' ratings over and above IQ, SES, and educational attainment by computing regression analyses that had occupational success and income as outcome variables. We included all scales that showed significant bivariate correlations with the outcome variables (see Table 1). The results of these analyses are reported in Table 2. We found different patterns of results for occupational success and income (as indicated by the bivariate correlations). To contrast the influence of the student characteristics and IQ, parental SES, and educational attainment, we tested three model sets (see Table 2). In Model Set A, IQ and SES explained 18% of the variance in occupational status and 10% of the variance in income. This result was comparable with the single effects of only the student characteristics as predictors (that were $R^2 = .19$ and $R^2 = .12$, respectively; not displayed in Table 2). Adding educational attainment in Model Set B increased the explained variance (to

35% and 22%, respectively). When the student scales and teacher-rated studiousness were added to the regression model (see Model Set C), all predictors explained 38% of the variance in occupational status and 27% of the variance in income. In Model Set C the responsible student scale (β = .08), teacher-rated studiousness (β = .13), IQ (β = .10), parental SES (β = .07), and years of education (β = .42) were significant predictors of occupational success. Income was predicted by rule breaking and defiance of parental authority (β = .12), IQ (β = .15), and years of education (β = .37). To investigate the possible suppression effects of any predictor that was not significantly related to the outcomes in the bivariate correlations we reran Model C with all possible predictors. The results did not differ from the results presented in Table 2 and are, therefore, not included in the article (when predicting occupational status, the responsible student scale (β = .09), teacher-rated studiousness (β = .12), IQ (β = .09), parental SES (β = .07), and years of education (β = .42) were significant predictors. Income was predicted by rule breaking and defiance of parental authority (β = .12), IQ (β = .16), and years of education (β = .38). In summary, we demonstrated that the responsible student scale, teacher-rated studiousness, and rule breaking and defiance of parental authority showed incremental validity over and above IQ, parental SES, and educational attainment.

We also tested possible moderation effects of IQ and the student characteristics as well as SES and the student characteristics. None of the moderations was significant and we, therefore, decided to not present the results in the manuscript.

Third, we tested whether educational attainment would mediate the effects of student characteristics and behaviors, intelligence, and parental SES on occupational success. Therefore, we tested two path models, one for each outcome variable. The results of these analyses are reported in Table 3, which contains the standardized coefficients for each path and the explained variance in the outcome variables. As we were interested in the direct and indirect effects of childhood personality characteristics, childhood IQ, and parental SES, we tested a mediation model in which educational attainment (operationalized as years of education) served as a mediator.

The results obtained for Model 1 (see Table 3) showed that rule breaking and defiance of parental authority, sense of inferiority,

Table 2

Results of Linear Regression Analysis: Predictors of Career Success

	Model Set A		Model Set B		Model Set C	
	β	95% CI	β	95% CI	β	95% CI
Occupational status (ISEI)						
IQ	**.31**	**[.25; .37]**	**.16**	**[.10; .22]**	**.10**	**[.03, .16]**
Parental SES	**.23**	**[.16; .29]**	**.08**	**[.03; .15]**	**.07**	**[.01, .13]**
Years of education			**.47**	**[.41; .54]**	**.42**	**[.35, .49]**
School entitlement					.00	[−.07, .08]
Responsible student					**.08**	**[.01, .14]**
Sense of inferiority					−.04	[−.11, 03]
Pessimism					−.05	[−.12, .03]
Studiousness (teacher ratings)					**.13**	**[.06, .20]**
R^2	.18		.35		.38	
Individual income						
IQ	**.26**	**[.19; .33]**	**.13**	**[.06; .20]**	**.15**	**[.07, .24]**
Parental SES	**.12**	**[.04; .20]**	.00	[−.07, .08]	.00	[−.09, .07]
Years of education			**.41**	**[.31; .50]**	**.37**	**[.27, .46]**
School entitlement					−.02	[−.11, .08]
Responsible student					.05	[−.03, .12]
Sense of inferiority					−.01	[−.10, .08]
Pessimism					−.02	[−.11, .08]
Rule breaking and defiance					**.12**	**[.04, .19]**
Studiousness (teacher ratings)					.03	[−.05, .12]
R^2	.09		.22		.27	

Note. SES = socioeconomic status; ISEI = International Socioeconomic Index of Occupational Status at age 52; CI = confidence interval. Individual income was mean-centered for males and females. Characters in bold indicate that the CI do not include 0. Predictors were included only when they had significant bivariate correlations with the outcome variables.

teacher-rated studiousness, IQ, and parental SES were significantly related to educational attainment and explained 29% of its variance. For occupational success, the predictors that were significant in the regression analyses were also significant here (responsible student scale, teacher-rated studiousness, IQ, parental SES, and years of education). In summary, the predictor variables explained 38% of the variance in occupational success after 40 years.

In predicting income, the pattern for the personality characteristics was slightly different (see Model 2). Sense of inferiority, teacher-rated studiousness, intelligence, and parental SES were significantly related to educational attainment and explained 32% of its variance. For individual income, the predictors that were significant in the regression analyses were also significant here (defiance of parental authority, intelligence, and years of education). In summary, the predictor variables explained 28% of the variance in individual income after 40 years.

The results of the mediation analyses are reported in Table 4, which comprises the standardized direct, indirect, and total effects of the predictors (via educational attainment) on the outcomes (occupational success and individual income). We did not display the decomposition of the effects of school entitlement and pessi-

Table 3

Results of Path Analyses: Predictors of Career Success

	Model 1				Model 2			
	Years of education		Occupational status (ISEI)		Years of education		Individual income	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
IQ	**.21**	**[.15, .28]**	**.10**	**[.03, .16]**	**.21**	**[.13, .28]**	**.15**	**[.07, .24]**
Parental SES	**.24**	**[.17, .31]**	**.07**	**[.01, .13]**	**.28**	**[.20, .37]**	.00	[−.09, .07]
Years of education	—	—	**.42**	**[.35, .49]**	—	—	**.37**	**[.27, .46]**
School entitlement	−.00	[−.09, .07]	.00	[−.07, .08]	−.02	[−.11, .06]	−.02	[−.11, .08]
Responsible student	.02	[−.05, .09]	**.08**	**[.01, .14]**	.04	[−.03, 11]	.05	[−.03, .12]
Sense of inferiority	−.09	[−.16, −.01]	−.04	[−.11, 03]	**−.10**	**[−.17, −.02]**	−.01	[−.10, .08]
Pessimism	−.05	[−.13, .03]	−.05	[−.12, .03]	.00	[−.09, .09]	−.02	[−.11, .08]
Rule breaking and defiance	**.07**	**[.01, .13]**	—	—	.05	[−.01, .12]	**.12**	**[.04, .19]**
Studiousness (teacher ratings)	**.19**	**[.12, .25]**	**.13**	**[.06, .20]**	**.20**	**[.13, .28]**	.03	[−.05, .12]
R^2	.29		.38		.32		.28	

Note. SES = socioeconomic status; ISEI = International Socioeconomic Index of Occupational Status at age 52; CI = confidence interval. Characters in bold indicate that the CI do not include 0. Individual income was mean-centered for males and females.

Table 4

Standard Direct, Indirect, and Total Effects of Childhood Characteristics and Behaviors, IQ, and Parental SES at Age 12 on Career Success at Age 52

Effect decomposition	Model 1: Occupational status (ISEI)			Model 2: Individual income		
	β	95% CI	% mediated	β	95% CI	% mediated
IQ						
Direct effect	**.10**	**[.03, .16]**		**.16**	**[.09, .24]**	
Indirect effect via education	**.09**	**[.06, .12]**		**.08**	**[.04, .11]**	
Total effect	**.18**	**[.11, .25]**	48.35	**.24**	**[.16, .32]**	31.54
Parental SES						
Direct effect	**.07**	**[.01, .14]**		.00	[−.08, .08]	
Indirect effect via education	**.10**	**[.06, .13]**		**.10**	**[.06, .15]**	
Total effect	**.17**	**[.11, .24]**	57.56	**.11**	**[.02, .19]**	96.30
Responsible student						
Direct effect	**.08**	**[.02, .14]**		.05	[−.03, .12]	
Indirect effect via education	.01	[−.02, .04]		.02	[−.01, .04]	
Total effect	**.09**	**[.02, .16]**	7.49	.06	[−.02, .14]	25.80
Sense of inferiority						
Direct effect	−.05	[−.13, .02]		−.02	[−.11, .07]	
Indirect effect via education	**−.04**	**[−.07, −.01]**		**−.04**	**[−.07, −.01]**	
Total effect	**−.09**	**[−.17, −.01]**	39.33	−.06	[−.16, .04]	62.71
Rule breaking and defiance						
Direct effect	.04	[−.02, .10]		**.12**	**[.04, .20]**	
Indirect effect via education	.03	[.00, .05]		.02	[−.01, .05]	
Total effect	**.07**	**[.01, .13]**	39.13	**.14**	**[.06, .22]**	14.29
Studiousness (teacher ratings)						
Direct effect	**.13**	**[.05, .20]**		.03	[−.06, .11]	
Indirect effect via education	**.08**	**[.05, .11]**		**.08**	**[.04, .11]**	
Total effect	**.20**	**[.11, .28]**	38.69	**.10**	**[.01, .19]**	73.78

Note. The total effect is the sum of the direct and indirect effects. Education was measured as years of education. SES = socioeconomic status; ISEI = International Socioeconomic Index of Occupational Status at age 52; CI = confidence interval. Individual income was mean-centered for males and females; Characters in bold indicate that the CI do not include 0. Effect estimates came from the completely standardized solution of the corresponding models. Percent mediated was calculated by dividing the total indirect effect by the total effect (cf. MacKinnon et al., 2001) but may differ slightly from the quotient total indirect effect/total effect in Table 4 because of rounding errors.

mism because they had no significant (in-)direct effects. With regard to the prediction of occupational success, 39% of the effect of sense of inferiority was mediated via educational attainment. There was almost no mediation of the responsible student scale. For teacher-rated studiousness, about one third of the total effect of teacher-rated studiousness was mediated by educational attainment. For childhood intelligence, almost half of the total effect was mediated by educational attainment. The percentage of the effect of the influence of parental SES that was mediated was almost two thirds.

For individual income, more than half of the effect of sense of inferiority was mediated by educational attainment. Rule breaking and defiance of parental authority was not mediated. More than two thirds of the effect of teacher-rated studiousness was mediated, whereas only one third was mediated by educational attainment. In addition, the effect of parental SES on income was almost entirely mediated by educational attainment. In summary, the mediational effect of educational attainment differed across the predictors.

Discussion

Drawing on a longitudinal nationally representative sample spanning 40 years from childhood to middle adulthood, this study was designed to add to the empirical body of knowledge on the relations between student characteristics and behaviors in childhood and important life outcomes. In doing so, we showed that

some of these noncognitive student predictors operate along both direct paths and indirect paths via educational attainment. More important, noncognitive childhood personality characteristics were found to predict educational attainment, occupational success, and individual income over and above childhood IQ and parental SES. Overall, our results show that individual differences in cognitive and noncognitive childhood characteristics may lead to cumulative effects on key life outcomes across the life span.

Which Childhood Characteristics Predict Educational Attainment?

In general, we found significant relations for childhood IQ and SES with educational attainment that is in line with the sociological and psychological models (see Blau & Duncan, 1967; Eccles, 2005). As there is much previous research on the validity of these predictors for educational success (e.g., Gottfredson, 2002; Gustafsson & Undheim, 1996; Kuncel et al., 2004), we will focus our discussion on student characteristics and behaviors.

Educational attainment was best predicted by defiance of parental authority, sense of inferiority, and teacher-rated studiousness. The effects were still significant after including IQ and parental SES as predictors. This is in line with Credé and Kuncel's assumption of independent effects. There are different possible explanations for the influences of the different scales.

First, students with high rule breaking and defiance of parental authority might be more competitive in the school context and more visible in interactions in the classroom. This might lead to at least higher oral grades compared with students with lower levels of rule breaking and defiance and to more demanding and encouraging teacher behavior. Rosenbaum (2001) demonstrated that teachers used not only the students' cognitive abilities to determine grades but also students' noncognitive behaviors. However, because of the archival nature of the data, we consider this finding as preliminary. Further research is needed to replicate this finding using a more comprehensive measurement approach (see below).

Second, a high level of sense of inferiority was associated with lower educational attainment. As the validation study (see the online Supplementary Material) revealed, this scale encompasses a feeling of inferiority in comparison with classmates with regard to exercises, homework, and abilities. It is also highly related to pessimism. Feeling inadequate in school seems to be a repressive and inhibiting factor for educational success. Yates (2002), for instance, demonstrated a negative link between pessimism and achievement in mathematics. Such negative values and beliefs seem to play an important role in learning and achievement; thus, they are expected to negatively influence educational attainment. In particular, maladaptive perceptions and attitudes might become self-fulfilling prophecies as feeling inadequate in the school context might lead to lower self-esteem and self-concept, both of which are known to be related to lower school achievement (Marsh, 1990; Nolen-Hoeksema, Girgus, & Seligman, 1986).

Third, teacher-rated studiousness was one of the most robust predictors of educational and occupational success. The teacher might be an especially good source of students' studiousness because teachers' ratings are based on observable behavior in the classroom and they keep track of how hard students work and students' willingness to learn. In a sample of high-ability males, Kern and colleagues (2009) demonstrated that teacher and parent ratings of Conscientiousness in childhood showed small but significant associations with occupational success. Our results also revealed an effect of teacher-rated studiousness on educational attainment.

Which Childhood Characteristics Predict Occupational Success and Income?

For predicting occupational success, several predictors were important over and above IQ, parental SES, and educational attainment: the responsible student scale and teacher-rated studiousness. We picked those variables as controls because they have been shown to be the most promising candidates: Childhood IQ and parental SES were previously shown to predict occupational success (e.g., Bradley & Corwyn, 2002; Heckman et al., 2006; Kuncel et al., 2004; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007) as predicted by Credé and Kuncel (2008). Therefore, we will focus our discussion on student characteristics and behaviors.

We found a direct influence of the responsible student scale on occupational success. This direct path may be accounted for by different mechanisms or processes. Being a responsible student may lead to higher task effectiveness (Roberts et al., 2007). Therefore, one could imagine that individuals who work harder and are more studious could also be more effective at accomplishing their tasks and daily routines. Moreover, individuals who are well-organized, act responsibly, work hard, demonstrate task persistence, and complete tasks thoroughly—all of which are aspects of the responsible student scale—are more productive in the long-term than individuals who score lower on such skills and abilities (Andersson & Bergman, 2011; Barrick, Mount, & Judge, 2001). For example, Duckworth and colleagues (2007) demonstrated that students with a high perseverance for long-term goals achieved higher educational attainment. In addition, attitudes and work habits were ranked as important factors for influencing hiring decisions (Stasz, 2001). Barrick and Mount (1991) showed in their meta-analysis that working hard and being conscientious were associated with higher job proficiency ratings.

Furthermore, the responsible student is characterized by focusing on homework and sustaining attention even when distracted. Therefore, another mechanism that might explain the association of the responsible student scale and midlife success outcomes might be task persistence, which was also shown to predict career success (Andersson & Bergman, 2011). We know from the validation study (see the online Supplementary Material) that students who score high on the responsible student scale can also be described as conscientious, open, and agreeable. This specific constellation of positive characteristics and behaviors seems like a potent combination for predicting success in life, and this is also in line with findings by Viinikainen and colleagues (2010). They found that constructiveness (high activity and high self-control) was related to career success. They also demonstrated that being reliable and reasonable in childhood led to higher success in adulthood. Moreover, Duckworth and colleagues (2007) demonstrated that students with a high perseverance for long-term goals achieved higher educational attainment.

In line with the self-report results, teacher-rated studiousness also had a direct relation to occupational success. This effect might work through the same mechanisms that apply to the responsible student scale, especially for studiousness, as it might be a proxy for the adult personality trait of conscientiousness. If so, then students who were ranked higher on studiousness in childhood would also be higher on Conscientiousness in adulthood and might be recruited into more challenging and complex jobs because of their personality traits (see Shiner & Caspi, 2003).

More important, the results demonstrate that a substantial part of the association between teacher-rated studiousness and occupational success across 40 years was mediated via educational attainment. Educational attainment was the strongest predictor as also predicted by Blau and Duncan (1967). The indirect path via educational attainment may be triggered by active niche-picking (see Roberts et al., 2007). Students choose educational experiences and environments whose qualities match their own personalities. Therefore, they might be more likely to choose challenging tasks and environments, which may then lead to higher qualifications and degrees. In turn, these environments may also reward such industrious behaviors and conscientiousness-related traits, and higher qualifications or educational attainment may open the door for more prestigious and better paying jobs (see Ritchie & Bates, 2013; Schoon, 2008).

One surprising finding was that rule breaking and defiance of parental authority was the best noncognitive predictor of higher income after accounting for the influence of IQ, parental SES, and educational attainment. Given the nature of our archival data, the possible explanations are rather ad hoc and our exploratory results

need to be replicated. This will help us better understand the construct. If there are no other omitted third variables, we might assume that students who scored high on this scale might earn a higher income because they are more willing to be more demanding during critical junctures such as when negotiating salaries or raises. For instance, individuals who scored low on Agreeableness were also shown to earn more money (Judge, Livingston, & Hurst, 2012). One explanation Judge and colleagues (2012) gave for this finding was that it might be because of the fact that such individuals value competition more than interpersonal relations and therefore want to advance their interests relative to others. Another explanation might be that individuals with higher levels of rule breaking and defiance of parental authority also have higher levels of willingness to stand up for their own interests and aims, a characteristic that leads to more favorable individual outcomes (Barry & Friedman, 1998)—in our case, income. This may be one of the reasons why defiance of parental authority plays a role in determining income—students who show higher levels of rule breaking and defiance are more likely to engage in negotiations about earning and payment (see Judge at al., 2012) and fight more strongly to achieve personal benefits. We also cannot rule out that individuals who are likely or willing to break rules get higher pay for unethical reasons. For instance, research in the field of organizational psychology showed that employees invest in unethical or deviant workplace behavior when they are not satisfied with their income and when they have a high level of love of money (Tang & Chiu, 2003). Thus, this kind of behavior might in turn lead to higher income. Nevertheless, further research is needed to better understand the construct and its mechanisms.

Early Individual Differences and Cumulative Advantages Over the Life Course

With the life span perspective of our dataset, we were able to identify the developmental significance of individual differences that emerge early for later important life outcomes. This supports the more general goal of life span approaches to understand personality across the life course (see Friedman, Kern, Hampson, & Duckworth, 2014; Kern, Hampson, Goldberg, & Friedman, 2014). Student characteristics and behaviors were rewarded in school and led to higher educational attainment as already stated in sociological models (e.g., Blau & Duncan, 1967). However, above and beyond the gatekeeping function of educational attainment, some of these characteristics (e.g., being a responsible student and showing defiance of parental authority) contributed to later occupational success. These initial individual differences in school-related and nonschool-related student characteristics and behaviors, particularly being an industrious and responsible student, might develop into a cumulative advantage over time over and above individual differences in education, IQ, and parental SES. Students behave in a certain way on the basis of their characteristics, and they experience events across the different phases of their lives. Thereby, those characteristics can be viewed as factors that initiate a cascade of events that will influence behavior and decisions over a long period of time. This idea of phase-specific and continuous processes linking personality traits (in particular: Conscientiousness) and important life outcomes (in particular: health) was also proposed by Shanahan and colleagues (see Shanahan et al., 2014). To the extent that these qualities are

consistent over time, the behaviors that are based on these traits (e.g., working hard) will be rewarded in educational and occupational environments, and such rewards in turn may lead to stability in showing these kinds of behaviors. In summary, this might lead to different developmental trajectories that are in part the result of the cumulative influences of individual differences in childhood in the student characteristics and behaviors.

Strengths, Limitations, and Future Directions

Major strengths of the present work consist of the life span longitudinal design, the inclusion of intelligence and family SES as predictors, and the (multiperspective) assessment of student characteristics and behaviors. Moreover, we assessed student characteristics and behaviors at a young age—before any selection process had begun. Therefore, it is unlikely that faking or social desirability could have biased the estimates. Despite these strengths, the present study has several limitations that have implications for the design of future investigations.

First, teacher-rated studiousness was measured by a single item. It is likely that this single item carries variance from multiple dimensions. This is especially the case given how well it predicts all outcomes in our study. Our single-item might overlap for instance with student achievement. Nevertheless, it is a unique and different construct because it captures also the motivational and personality-based component of achievement. Studiousness or related constructs such as industriousness and Conscientiousness were shown to be related to and predict achievement in earlier studies (see Poropat, 2009). We, of course, would prefer to have a multi-item rating scale provided by the teachers, but that was not gathered in the original assessment. We still feel it is important to include the single item rating, as it is unusual for studies of this structure to have access to both self-reports and observer ratings of any sort. In future studies we aim to examine the potential multidimensional nature of the rating.

Second, because the current study involved longitudinal data from 40 years ago, we had to rely on the questionnaires that were administered back then because the currently more widely used personality questionnaires such as the Big Five did not exist 40 years ago. Thus, we had to reconstruct the measurement framework for the student questionnaire as the original documentation was not available. We believe we overcame this limitation by factor analyzing our items and then testing the reliability and validity of our empirically derived scales. Moreover, we studied the relations of these scales with existing questionnaires in an additional sample. Here, we applied methods of integrative data analysis (Curran & Hussong, 2009) by drawing on data from two independent samples. In doing so, our goal was to make the most of the information provided by the MPS instrument (for which no measurement framework was available) and a more comprehensive measure of personality (see online Supplementary Material). Even if this additional step is somewhat uncommon, the results obtained in the validation study (see the online Supplementary Material) confirmed the validity and reliability of the scales obtained from the original student questionnaire and used in the present study. Our results showed that another challenge of future research will be to incorporate existing longitudinal data with reliable, new measures of personality. Moreover, our results need

to be replicated as our findings were demonstrated in a specific population (students in the 1960s) and a specific educational system (Luxembourg).

One avenue for future research should be to provide a closer examination of the relation between individual differences and educational research. Theories about personality development and knowledge about educational environments such as school should be connected to identify possible influences on stability and change in student characteristics and behaviors within the school context. Students spend the majority of their adolescent lives in school. Some of these environments probably have the potential to shape personality development. In a next step, the important elements of these environments need to be identified and tested.

Conclusion

To conclude, student characteristics and behaviors play significant roles in important life outcomes over and above socioeconomic factors and cognitive abilities. We demonstrated that being successful is more than "just" having good cognitive resources and coming from a socially advantaged family and that personality-related characteristics and student behavior measured early in life are important predictors of life outcomes in midlife. This coherent pattern of results strengthens the power of personality and personality-related traits in the context of real-life outcomes. Considering that several traits and characteristics that were previously demonstrated to be predictive of educational attainment and career success (e.g., parental SES and intelligence) were controlled for, the incremental and independent influences of student behavior and childhood personality characteristics—measured early in life—add to our understanding of which factors in late childhood are important for successful adaptation in middle adulthood.

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