

Intention to Study and Personality Traits

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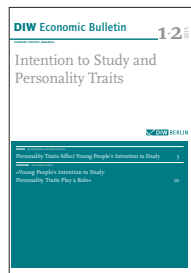


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Personality Traits Affect Young People's Intention to Study

By Frauke Peter and Johanna Storck

Although in recent years the number of new students has been growing constantly, socio-economic differences remain an issue in the transition from school to college: those eligible for higher education whose parents do not have a college degree are less likely to take up higher education than their peers from academic parental homes. This means that they may not be fully utilizing their educational potential. A study by DIW Berlin examines how personality traits for both groups play a role in creating the intention to go to college. The present study is based on data from the Socio-Economic Panel (SOEP) study and shows that personality traits do indeed affect the intention to study of adolescents aged 17. The probability of taking up tertiary education increases among students taking their *Abitur* (school-leaving certificate that serves as a qualification for German university entrance) when they are more open to new experiences or are less anxious and insecure. This applies to young people with the same academic performance and in particular to students from non-academic parental homes.

The transition from school to college is still a debated issue among family and education policy-makers. Despite almost 50 percent of the population taking up tertiary education during their lifetime,¹ equality of opportunity remains an important issue: the probability of *Abitur* graduates from families in which no one has a higher education degree going to college is 20 percentage points lower than for *Abitur* graduates from academic families.²

The main reasons provided by international studies in education economics for the different groups making unequal decisions about studying are financial restrictions. High tuition fees can be a huge burden on students, especially in the English-speaking world. In contrast, financial restrictions in Germany should be less relevant — particularly since the abolition of tuition fees.³

A lack of information is more likely to affect the decision to study for students whose parents have not studied.⁴ High-school students who are potentially the first in the family to go to college frequently underestimate the economic advantages of studying. In this case, the parents do not act as a reference group in which the advantages of studying would be observable. Moreover, uncertainties as to whether they can successfully complete tertiary education often results in students first starting a vocational training course in order to have something to fall back on.⁵

¹ Storck, J., "Hochschulstudium: nicht ausgeschöpfte Potentiale trotz „Akademisierungswahn“, DIW Roundup, no. 2, DIW Berlin (2013).

² Autorengruppe Bildungsberichterstattung, Bildung in Deutschland 2014. Ein indikatorengestützter Bericht mit einer Analyse zur Bildung von Menschen mit Behinderungen (Bielefeld: Bertelsmann, 2014).

³ It has been shown that government financed student aid in Germany (BAföG) can have an effect on the decision to study, but this is relatively low (see Steiner, V. and K. Wrohlich, "Financial Student Aid and Enrollment in Higher Education: New Evidence from Germany," *Scandinavian Journal of Economics* 114 (2012): 124–147.

⁴ Compare this section with Peter, F. and V. Zambre, "Wer studiert, ist informiert? Studienentscheidungen und Informationsdefizite," DIW Roundup, no. 35 (2014).

⁵ Lörz, M., "Mechanismen sozialer Ungleichheit beim Übergang ins Studium. Prozesse der Status- und Kulturreproduktion," *Kölner Zeitschrift für Soziologie*

Nevertheless, financial restrictions and information inequality still do not fully explain the entire decision-making behavior of young people who have left school and are faced with making a decision about their future education path. To some extent, this decision-making behavior remains unexplained by economic models. Possible reasons might be found among differences in non-cognitive skills. Examples of these skills include risk behavior, locus of control, motivation, and personality traits. This study considers personality traits as a factor affecting decision-making and examines whether these traits are essential in removing barriers to taking up tertiary education.

Personality Is an Important Factor in Making Education Choices

Economic studies to date have examined the relevance of personality traits for success in the labor market, including risk of unemployment and achievable wages, or for health.⁶ The correlation between personality traits and preferences for studying has been rarely considered, however.

In the literature on education economics, it is mainly studies in English-speaking regions that examine the effect of personality traits on education.⁷ First, they show that non-cognitive skills affect education decisions two-fold: they can influence both the desire for a college degree and the actual transition after school. Second, a US study by Lundberg shows that personality has varying effects on educational decisions depending on family background.⁸ What is critical here is that the personality traits in this study are measured *after* graduation. However, graduation may have already affected the personality traits of those young adults.⁹

The analyses underlying the present study are based on data on personality surveyed at the same time as intention to study.¹⁰ Consequently, it has been possible to calculate the effect of personality traits on young people's

intention to study without graduation having influenced those personality traits.

Our analysis also differs from others in that it examines intention to study and not the actual transition to college. In contrast to the actual transition to college, the desired degree (intention to study) measures the individual preference for higher education. This is useful since this parameter may be less affected by external circumstances such as a lack of college places. It is also assumed that the intention tends to be more influenced by personality traits than the action.¹¹

The Socio-Economic Panel Study is Well Suited to Examining Personality Traits

The following analyses are based on data from a household and individual survey representative of Germany, the Socio-Economic Panel (SOEP) study.¹² This draws on data from the SOEP survey waves between 2006 and 2013 which were collected by DIW Berlin in cooperation with the fieldwork organization TNS Infratest Sozialforschung. Personality traits are recorded in the SOEP using five factors (see box).¹³ The five-factor model allows to summarize young people's details about their person using five personality dimensions which are important indicators of an individual's personality. The first dimension is *conscientiousness*, for instance, a person's tendency to be well organized, responsible, and hardworking. The *openness* dimension describes an individual's preference for learning and the *neuroticism* dimension describes emotional stability and resistance to stress. *Extraversion* includes, for example, a person's drive and assertiveness and the *agreeableness* dimension shows willingness to cooperate.

Only young people aged 17, attending a high school, a comprehensive school, or a vocational school, aiming to complete their *Abitur*, and still living with their parents were included in our study. Overall, the analyses are based on a sample of approximately 1,000 young people aged 17 who indicated a preference for or against studying for a college degree. The study also divided families into non-academic and academic based on the highest parental educational attainment. Specifically, a young

und Sozialpsychologie, no. 52 (2013): 302–324.

6 For a summary of the literature on personality traits, see Storck, J., "Wie Bildungsentscheidungen mit Persönlichkeitseigenschaften zusammenhängen," DIW Roundup, no. 38 (2014).

7 See for a detailed overview, J. Storck, "Wie Bildungsentscheidungen mit Persönlichkeitseigenschaften zusammenhängen."

8 Lundberg, S.J., "The College Type: Personality and Educational Inequality," *Journal of Labor Economics*, vol. 31, no. 3 (2013): 421–441.

9 Psychologists McCrae and Costa show that a person's personality only remains stable for the rest of his or her life after the age of 30 (see McCrae, R. and Costa, P.J., "A five-factor theory of personality," in L. A. Pervin and O. John, eds, *Handbook of Personality: Theory and Research* (New York: Guilford, 1999): 139–153).

10 For a detailed analysis, see Peter, F. and J. Storck, "Personality Traits and Preferences for College Education," unpublished manuscript available on request.

11 One reason for the focus on intentions is described by psychologist I. Ajzen in "The theory of planned behavior" in *Organizational Behavior and Human Decision Process* 50, (1991): 179–211. He describes intentions as an indication of how strongly the individual will try to induce an actual action.

12 See Wagner et al., "The German Socio-Economic Panel Study (SOEP)—Scope, evolution, and enhancements," *Schmollers Jahrbuch* 127 (1) (2007): 139–169.

13 See Weinhardt, M. and J. Schupp, "Multi-Itemskalen im SOEP Jugendfragebogen," *DIW Data Dokumentation* 60 (2011).

Box

Personality Traits of the Five-Factor Model

The personality traits of young people are surveyed in the SOEP through statements about their person that they agree or disagree with. The response scale includes values from 1 (strongly disagree) to 7 (strongly agree). The table in this box shows how the individual statements are assigned to five personality dimensions based on the five-factor model by McCrae and Costa (1995). Lang and Lüdtke (2005) and Almlund et al (2011)¹ summarize the significance of the individual personality dimensions as follows: *openness* (to new experiences) describes willingness to embrace change, *conscientiousness* includes the pursuit of achievements and responsibility, *extraversion* includes drive and assertiveness, *agreeableness* describes trust and altruism, and *neuroticism* refers to the different facets of anxiety, impulsiveness, and vulnerability. The measures of personality traits are formed using the method of factor analysis and contain standardized values with a mean of 0 and a standard deviation of 1. This allows us to describe an individual's personality as a combination of the five dimensions in varying degrees.

¹ McCrae, R. and P.J. Costa, "Domains and Facets: Hierarchical Personality Assessment Using the Revised NEO Personality Inventory," *Journal of Personality Assessment*, 64(1) (1995): 21-5; Lang, F.R. and O. Lüdtke, "Der Big Five-Ansatz der Persönlichkeitsforschung: Instrumente und Vorgehen," in Schumann, eds, *Persönlichkeit: eine vergessene Größe der empirischen Sozialforschung* (Wiesbaden, 2005); Almlund et al, "Personality psychology in economics," NBER Working Paper 16822 (2011).

Table

Recording Personality Traits in Adolescents Aged 17 Years

Personality dimension	I am...
Openness (to new experiences)	...original, sometimes come up with new ideas; ... someone who values artistic, aesthetic experiences; ...imaginative; ...eager for knowledge
Conscientiousness	...a thorough worker; ...somewhat lazy (-) ¹ ; ... effective and efficient in completing tasks
Extraversion	...communicative, talkative; ...outgoing, sociable; ...reserved
Agreeableness	...sometimes a bit rude to others (-) ¹ ; ...forgiving; ... considerate and kind to others
Neuroticism (emotional stability) ²	...a worrier; ...nervous; ...relaxed, able to deal with stress (-) ¹

¹ In these three items, the 1-7 scale is reverse coded, i.e., 7=1 and 1=7.

² People with a low neuroticism value are emotionally stable and less prone to stress.

Source: DIW Berlin/SOEP (Ed.) (2014): *SOEP 2013 – Erhebungsinstrumente 2013 (Welle 30) des Sozio-oekonomischen Panels: Jugendfragebogen, Altstichproben, SOEP Survey Papers, No. 183.*

person is categorized as coming from an academic home if at least one parent has a college degree.

The SOEP surveys the educational qualifications young people are striving to attain after completing their *Abitur*. If a student states that he or she would like to attend college after *Abitur*, this is generally summarized as an intention to study. Our evaluations show that 66 percent of young people aged 17 would like to take up further education. A total of 73 percent of academic children are aiming for a degree; in contrast, the corresponding figure for their classmates whose parents do not have an academic background is only 56 percent.¹⁴

Are All Five Personality Traits Relevant for Intention to Study?

In order to determine the link between personality traits and intention to study, other factors such as school

grades or parents' income, also have to be taken into account, since these, too, can affect the intention to study.

A first descriptive glance, excluding other factors, shows there are some differences between the personality traits of young people who are planning to study and those who are not (see Table 1). For instance, young people who want to go to college are more open to new experiences, less agreeable, and less neurotic, than 17-year-olds not aiming to obtain a college degree.

School grades are also included in the analyses to take into account the role of cognitive skills in the intention to study. This is essential since cognitive and non-cognitive skills are closely connected and both are possibly linked to intention to study.¹⁵ Table 1 shows that better grades are associated with a greater preference for college.

¹⁴ These figures are unweighted and therefore only apply to our sample.

¹⁵ Poropat, A., "A meta-analysis of the five-factor model of personality and academic performance," *Psychological Bulletin* 135 (2) (2009): 322-38.

Table 1

Personality Traits and Grades by Intention to Study at Age 17

In Standard Deviations

	No Intention to study	Intention to study	Difference
	Mean		
Conscientiousness	-0.07	0.04	-0.11
Agreeableness	0.10	-0.03	0.14*
Openness	-0.09	0.06	-0.15*
Extraversion	0.05	-0.03	0.08
Neuroticism	0.16	-0.08	0.24***
Standardized German grade	0.17	-0.12	0.30***
Standardized Math grade	0.15	-0.09	0.25***
Observations	1 017		

Note: Grades are standardized according to school type.

Source: Own calculations based on SOEP v30, Waves 2006–2013.

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Personality traits of students who have the intention to go to college differ from those who do not intend to go.

Moreover, personality traits may vary according to parents' educational background which, in turn, affects the intention to study to varying degrees. The following section will therefore show to what extent high-school students' personality traits differ according to the educational level of their parents.

Children from non-academic parental background are less open to new experiences while being more agreeable than those from an academic parental background (see Table 2). For instance, the value for *openness* among high-school students whose parents did not study is significantly below that of children who come from an academic parental home. These values also differ for *agreeableness*: here, non-academic children have a higher value than their "academic" classmates. The standardized¹⁶ grades in math and German are somewhat higher for students from academic families than for the group of non-academics.

To ensure the differences identified are not due to other factors, in the further course of the analysis, additional factors affecting intention to study and personality are taken into consideration: these include parents' education, household income, number of siblings, birth order, school grades in math and German, grade repetition,

¹⁶ Grades are given by the students themselves from their last school report. Since the students attend different types of school and the grading system can vary under certain circumstances, the grades were standardized according to school type.

Table 2

Personality Traits and Grades at Age 17 by Parental Education

In Standard Deviations

	Non-Academic background	Academic background	Difference
	Mean		
Conscientiousness	0.04	−0.02	0.05
Agreeableness	0.09	−0.04	0.13*
Openness	−0.10	0.09	−0.19**
Extraversion	0.04	−0.03	0.07
Neuroticism	0.06	−0.04	0.11
Standardized German grade	0.10	−0.11	0.21**
Standardized Math grade	0.08	−0.07	0.16*
Observations	1 017		

Note: Grades are standardized according to school type.

Source: Own calculations based on SOEP v30, Waves 2006–2013.

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Students whose parents did not attend college are less open to new experience than their classmates from an academic home.

gender, and migration background. Maternal personality traits are also included in a further specification.¹⁷

Openness to New Experiences Is an Important Personality Dimension for the Intention to Study

The findings of the analyses are estimated using a linear probability model. The findings without additional control variables suggest that *openness* to new experiences has a positive effect on intention to study. Conversely, students with high values for the traits of *agreeableness* and *neuroticism* appear to be less inclined to go to college (see Table 3, column 1).

If the effect of personality is examined, while taking into account all the characteristics mentioned above – apart from grades (see Table 3, column 2) – the positive effect of *openness* on the probability of striving to go to college is confirmed. Conscientious young people are also more likely to want to study. This last correlation no longer applies, however, if academic performance is integrated into the model. Since the trait of *conscientiousness* and school performance are relatively closely correlated, the effect of *conscientiousness* is explained by school performance. The association with *openness* and *neuroticism* (emotional stability) still holds, however. The effect of

¹⁷ On the correlation of personality traits between parents and their children, see Anger, S., "Die Weitergabe von Persönlichkeitseigenschaften und intellektuellen Fähigkeiten von Eltern an ihre Kinder," DIW Wochenbericht, no. 29 (2012): 3–12.

Table 3

Correlation between Personality Traits and Intention to Study

Coefficients from a linear probability model

	Model Specification			
	1	2	3	4
Conscientiousness	0.023	0.028*	0.010	0.008
Agreeableness	-0.035**	-0.030**	-0.027*	-0.024
Openness	0.042***	0.031**	0.027*	0.021
Extraversion	-0.022	-0.019	-0.016	-0.011
Neuroticism	-0.061***	-0.053***	-0.049***	-0.053***
East	-0.089**	-0.066*	-0.084**	-0.092**
Academic parental background		0.119***	0.113***	0.103***
Female		-0.018	-0.034	-0.043
Migration background		0.051	0.054	0.056
Household income		0.081***	0.067**	0.076**
Place of living: urban		0.087***	0.080**	0.082**
Number of siblings		0.062**	0.062**	0.055**
Birth order		-0.025	-0.024	-0.029*
Standardized German grade			-0.050***	-0.051***
Standardized Math grade			-0.026	-0.026
Grade repetition			0.073	0.063
Year indicators	✓	✓	✓	✓
Maternal personality traits	-	-	-	✓
Constant	0.755***	-0.056	0.072	0.043
Observations	1 017	1 017	1 017	981
Adjusted R ²	0.034	0.078	0.090	0.093

Notes: Standard errors in parentheses.

Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Own calculations based on SOEP v30, Waves 2006–2013.

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The correlation between personality traits and college intention is verified.

openness is approximately half that of the grade in German, while the effect of *neuroticism* is similar to that of the grade in German (see Table 3, column 3).

The parents' personality traits have an effect on the personality of their children and also influence the children's characteristics such as motivation and aspirations. Consequently, in a fourth specification, we also take into account the mother's personality traits. The effect of young people's personality traits on their intention to study decreases if the mother's personality traits are included. Apart from the negative correlation between study aspirations and *neuroticism*, there is no longer any statistically significant association between the high-school students' personality traits and the intention to study (see Table 3, column 4).¹⁸

¹⁸ Since the information on mother's personality is missing for some students, only a limited comparison of these findings with other specifications is possible.

Correlation between Intellectual Curiosity and Intention to Study

As described in Box 1, the factors for measuring personality consist of various personality attributes (items). The individual items show that the intention to study is driven, in particular, by the item "I am eager for knowledge". Also, individuals who value aesthetic experiences have a greater intention to study. Both items contribute to the measurement of the trait of *openness*, which is frequently also referred to as "intellect". The item "I am a worrier" appears to be a major factor affecting the trait of *neuroticism* (see Table 4).¹⁹

Openness Is Largely Relevant to Non-Academics

The children of academics and non-academics are considered separately. Depending on the environment in which children grow up, the personality trait and other factors may play a greater or lesser role in the intention

¹⁹ No single item can be found to explain the relevance of agreeableness.

Table 4

Correlation between Specific Personality Attributes (Items) and Intention to Study

Coefficients from a linear probability model

I am	
Openness	
original, sometimes come up with new ideas	-0.001
imaginative	-0.009
someone who values artistic, aesthetic experiences	0.016*
eager for knowledge	0.045***
Agreeableness	
sometimes a bit rude to others	0.004
forgiving	-0.015
considerate and kind to others	-0.007
Neuroticism	
a worrier	-0.021**
nervous	0.001
relaxed, able to deal with stress	-0.004
Year dummies	✓
Maternal personality traits	-
Observations	1 017

Notes: The estimation contains all other items and all control variables specified in model specification 3. Standard errors in parentheses.
Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Own calculations based on SOEP v30, Waves 2006–2013.

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Eagerness for knowledge is relevant for study intention.

to study. For instance, the trait of *openness* to new experiences might play a greater role for high-school students who may be the first in their family to go to college than for high-school students whose parents have already studied. The trait of *neuroticism*, too, which also includes the propensity to worry, might have a stronger effect on those who would be the first academic in their family. These are often affected by problems of limited funding, concern about not coping with tertiary education or not finding a suitable job after completion. They then opt for vocational training as a form of “safety net.”²⁰

If the model described above is assessed separately for “first-time academics” and for the children of academics, it can be seen that the trait of *openness* is relevant for prospective new academics aspiring to go to college (see Table 5). This trait appears to be less important for the group of “academic” children; conversely, the probability of striving to go to college is lower, the more agreeable the young person from an academic family is.

²⁰ Some studies describe this behavior as a safety net (see, for example, Backes-Gellner, U. and S. Tuor, “Risk-Return Trade-Offs to Different Educational Paths: Vocational, Academic and Mixed,” *International Journal of Manpower* 31 (5) (2010): 495–519.

Table 5

Correlation between Personality Traits and Intention to Study by Parental Education

Coefficients from a linear probability model

	Non-academic background	Academic background
Conscientiousness	0.008	0.009
Agreeableness	-0.003	-0.042**
Openness	0.042*	0.019
Extraversion	-0.016	-0.015
Neuroticism	-0.070***	-0.039**
East (reference: west)	-0.092	-0.086*
Female (reference: male)	-0.117**	0.015
Migration background	0.072	0.033
Household income	0.011	0.095***
Place of living: urban	0.086	0.072*
Number of siblings	0.063	0.065**
Birth order	0.005	-0.040*
Standardized German grade	-0.075***	-0.037**
Standardized Math grade	0.003	-0.047**
Grade repetition	0.108	0.046
Constant	0.504	-0.019
Year dummies	✓	✓
Maternal personality traits	-	-
Observations	410	607
Adjusted R ²	0.031	0.076

Notes: Standard errors in parentheses.
Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Own calculations based on SOEP v30, Waves 2006–2013.

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Openness is of particular relevance for children from a non-academic background.

Furthermore, it is possible that certain personality traits or academic achievements vary for men and women. These potential differences can be detected if the joint effect of grades and gender is taken into consideration in the model. Yet the empirical findings do not indicate any differences between women and men. Women’s intention to study is no more strongly affected by a particular personality trait than that of men. The grade in German appears to have a stronger positive effect on intention to study for female high-school students than for their male classmates, however (not shown in table).

Conclusion

Both personality traits and academic performance or parents’ educational background play a role in intention to study. Even though the family environment in which a high-school student grows up is still the most important predictor of intention to study, non-cognitive skills should also be taken into account if educational aspirations and educational choices are examined.

From a research perspective, it can be concluded that high-school students who are inquisitive and value aesthetic experiences—in other words, are open to new experiences—more frequently intend to go to college. Fostering these traits in early childhood education and school could help those whose parents have not studied aim at going to college.²¹ Better information on access to college for high-school students who cannot rely on their

parents' experiences could also facilitate access to higher education since at present those whose parents did not go to college require a high level of *openness* to explore the “new world” of higher education. Providing more information could help bridge the gap from high school to college and thus also lessen the role of the trait of *openness* to new experiences. For high-school students who are prone to worrying, secure funding opportunities such as scholarships or more information about funding studies through student grants could alleviate their concerns and make it easier for these students to enter higher education.

21 The “Early Childhood Socialisation” study by the German National Academy of Sciences Leopoldina, dated July 2014, includes some guidance on how non-cognitive skills can be promoted in early childhood.

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Dr. Johanna Storck, Research Associate in the Department of Education and Family at DIW Berlin

SEVEN QUESTIONS TO JOHANNA STORCK

»Young People's Intention to Study: Personality Traits Play a Role«

1. Dr. Storck, the decision to study can be motivated by all kinds of reasons. You have examined to what extent young people's personality traits affect their intention to study. Why did you do this? We know, for example, that financial restrictions play a role in the decision to study, as does a lack of information. Young people may not know the benefits of studying or how to finance a college course. But studies in the economics of education that take these two points into consideration only provide a partial explanation, and personality traits or also risk behavior, or an individual's own motivational ability might also play a role. Here, we focus on various personality traits and examine the extent to which these may have an effect on intention to study.
2. How do you measure personality traits? We measure the personality traits using what is known as the five-factor model, a concept from psychology. We use the data from the Socio-Economic Panel (SOEP) study for this. Personality is divided into five personality dimensions: these are openness to new experiences, conscientiousness, extraversion, agreeableness, and neuroticism.
3. How do the personality traits of young people who want to study and those who don't want to study differ? Our study shows that high-school students who intend to go to college after completing their Abitur, or school-leaving qualification, are more open than their classmates who have no plans to go to college. However, they score lower for agreeableness, and we also find that conscientiousness correlates positively with intention to study.
4. What personality traits are particularly important for intention to study? Openness to new experiences, neuroticism and agreeableness are certainly all important for intention to study. But we also compare the group of high-school students whose parents have studied and the group whose parents have not studied, in other words, high-school students who are potentially the first in their family to go to college. It is precisely for this group that openness is particularly important.
5. To what extent are these personality traits shaped by the parental home? Our data shows that there are differences in personality, depending on whether or not the parents have studied. We find, for example, that non-academics score lower for the trait of openness. At the same time, however, we find that openness is an important factor for intention to study. If we then estimate the correlation between personality traits and intention to study separately for children of academics and non-academics, we find that openness is of particular relevance for children of non-academics.
6. Do these findings apply equally to both genders? There is no difference in the correlation between personality traits and intention to study for men and women in our model. This means the individual personality traits are of equal relevance for men and women.
7. What is the significance of your findings for education policy? As far as education policy is concerned, our findings could mean that it is not only important to foster cognitive skills, that is, school performance, in school or even already in early learning but also important to promote non-cognitive skills, that is, personality traits. Mentoring programs and improved information about access to college could possibly bridge the gap to also allow those who would be the first person in their family to study. This would make it possible to remove obstacles hampering access to college for high-school students who are not as open to new experiences.

Interview by Erich Wittenberg