# Cooperative education in the higher education system and Big Five personality traits in Germany

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Students in psychology are often surveyed for personality. Empirical results show relevance of this topic, because personality influences academic success. In contrast, we know much less about the personality of students of cooperative education. So, we collected data from 5,863 students at Baden-Wuerttemberg Cooperative State University in August 2016. Multivariate analysis of covariance (MANCOVA) indicated that gender (partial $\eta^2$ = .06), academic field (partial $\eta^2$ = .01) and covariate university entrance scores (partial $\eta^2$ = .05) have an effect on Big Five personality traits controlling age and social class. The results can be used for selecting students in cooperative education for academic fields and compare them with other types of study.

Keywords: Cooperative higher education, work-integrated learning, Big Five traits, personality

Interest in cooperative education has increased (e.g., Linn, Howard, & Miller, 2004; Coll & Zegwaard, 2011). The reason for this is that companies are in need of skilled workers with practical experience in addition to a university degree. Currently, little is known about these students who study in a cooperative education system. An example of this is the usage of the Big Five personality traits questionnaires. Most often, the convenient sample of psychology students is used for research in this field. However, these results cannot be generalized, because psychology students differ from other students due to self-selection (Vedel, Thomsen, & Larsen, 2015).

## BIG FIVE PERSONALITY TRAITS AND STUDENTS

Maybe one of the most frequently asked questions in psychology is, "What are different kinds of people like?" (Kaufman, Pumaccahua, & Holt, 2013). Personality research often uses the Big Five model to explore this question. Most research reports on the subject are found in clinical and industrial psychology, but more studies in education have been postulated in the past (de Fruyt & Mervielde, 1996). For example, Rubinstein (2005) shows that personality variables impact career choice of academic majors at the university level. These personality traits, also known as Big Five, are: *openness* (to experience), *conscientiousness, extraversion, agreeableness* and *neuroticism*.

Vedel et al. (2015) summarize a general trend: business students tend to score low on *agreeableness* and *neuroticism*, whereas psychology and arts/humanities students score high on these scales; arts/humanities students score low on *conscientiousness*; science students score low and business students scored high on *extraversion;* and psychology and arts/humanities students score high on *openness*. Students of technology were not included in this research.

Gender differences on these personality traits have been debated since the 1970s especially in the STEM (science, technology, engineering and mathematics) fields (Watt & Eccles, 2008). For example, currently only 20% of the graduates in the fields of engineering, computer sciences and physics in the United States are female (National Science Foundation [NSF], 2017). So, interests and personality

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could play a critical role in occupational choice as indicated in a meta-analysis by Su, Rounds, and Armstrong (2009). For example, Rubinstein (2005) shows in his results based on the Big Five, that women score significantly higher on *agreeableness* and *conscientiousness* than men. Vedel et al. (2015) found a moderate effect for *neuroticism*, with females scoring slightly higher than men.

Researchers are very attracted to the study of performance (Vedel et al., 2015). Academic performance is viewed as an indicator for economic success and welfare of a country (Organisation for Economic Co-operation and Development [OECD], 2012). However, researchers still argue about what academic performance really is. Trapmann, Hell, Hirn, & Schuler (2007) suggested grades, retention and satisfaction to be important components. Big Five and university entrance score have been found to be predictors for academic success, defined by Grade Point Average (GPA) at the university level (Trapmann, Hell, Weigand, & Schuler, 2007; Vedel, 2014). O'Connor and Paunonen (2007) found that *conscientiousness* is strongly and consistently associated with academic success. However, no studies have yet specifically explored university entrance scores and Big Five in a sample of cooperative students, even though the university entrance score is a selection criterion for university admission as well as a requirement for job placement.

## COOPERATIVE EDUCATION

In general, cooperative education combines three elements (Graf, Powell, Fortwengel, & Bernhard, 2014): vocational education, higher education, and on-the-job training. Within this framework, companies and higher education institutions create learning environments together. Students receive theoretical input at the university and gain practical experience in the company environment. The advantage of this system is that students are trained by academic faculty as well as company experts. The resulting synergy of theoretical inputs and practical elements create a unique, enriched learning environment that allows for the transfer of theoretical knowledge into a practical work-related setting (Reinhard & Pogrzeba, 2016).

The cooperative education model varies greatly in between different countries (Graf, 2013). An article by Reinhard, Pogrzeba, Townsend, and Pop (2016) presents an overview of cooperative education models in Germany, South Africa and Namibia and reports that profound differences between these countries are standardization and tradition of this type of education. However, all countries have minimum requirements regarding work assignment at the partner companies. Furthermore, there is consensus that changes to a model of cooperative education should be undertaken in a very careful process of change, so that the benefits for industry and economy will not only be of short duration.

Due to two recent developments, German concepts of education are becoming more and more important (Graf et al., 2014). On the one hand, Germany shows itself to be robust in the current financial and economic crisis, particularly in terms of youth unemployment. The concept of dual vocational education is a major contributor to success here. On the other hand, there is an interface between initial vocational training and higher education. This form of education can play an important role in the development of competences in professions in the 21st century, especially regarding the predicted shortage of skilled workers (Graf et al., 2014).

In Germany, the Duale Hochschule Baden-Württemberg (Baden-Wuerttemberg Cooperative State University) is one of the biggest institutions specifically for cooperative students containing three schools (Business School, School of Engineering and School of Social Work). It offers approximately 204 cooperative study programs (Federal Institute for Vocational Education and Training], 2014) and has an enrollment of nearly 34,000 cooperative students.

In comparison with students from traditional universities, cooperative students must be in possession of an employment contract. They also need to have the appropriate university entrance qualification (Figure 1). In this system, cooperative students benefit from a monthly salary for the duration of their bachelor studies (including theoretical semesters) and the insurance status of a regular employee. These bachelor degree programs are made up of 210 ECTS (European Credit Transfer System) credits in six semesters, instead of the 180 credits offered by a standard university bachelor program. In regular intervals of three months, a cooperative student rotates between academic training at the university and workplace training at the company. For cooperative students, employability and job security are high. About 90% of students obtain a permanent contract of employment upon graduation, usually with their corporate partner. This system also benefits employers. During workplace training, students work on company tasks as part of the practical work portion required for the degree. After graduation, companies have skilled workers that are already specifically trained for company needs. Results of this are lower recruitment costs and miscast risks. These graduates also need less training time initially to become productive employees (e.g., Braunstein, Takei, Wang, & Loken, 2011; Reinhard & Pogrzeba, 2016).


FIGURE 1: Curriculum of Baden-Wuerttemberg Cooperative State University in 2016

## COOPERATIVE STUDENTS ARE DIFFERENT

Most research in higher education focuses on university students. However, some research in the field of comparative education suggests that cooperative students differ from students of other university types. Kramer et al. (2011) reported that cooperative students come from a lower social class but have higher cognitive abilities, such as university entrance scores, than students from other higher education institutions. Furthermore, cooperative students prefer practical elements and they are less open to new experiences. Weich, Kramer, Nagengast, and Trautwein (2017) show also that cooperative students have better university entrance scores, a higher concept of self, and were more convinced of their independence and motivation for learning than students from universities of applied sciences.

The findings show heterogeneity among students. Traditional universities in Germany do not seem to successfully reach students with best university entrance scores and cognitive performance (Kramer et al., 2011). Consequentially, researchers are required to find differences between these students and reasons for why they "vote with their feet". This paper attempts to contribute to this

discussion. Therefore, as a first step, we analyzed personality traits of cooperative students. Further investigations should compare these traits with traits from traditional university students.

## AIMS AND HYPOTHESIS

The aim of this research was to explore differences in the Big Five personality traits by simple demographic variables. Based on the listed findings above, we controlled our model for age as well as for social class and propose the following hypotheses:

> H1: Female students score higher than male students in *agreeableness, conscientiousness* and *neuroticism.*
>
> H2: Business School students score high on *extraversion* and low on *agreeableness* and *neuroticism.* Students of the school of social work score high on *agreeableness, neuroticism* and *openness.*
>
> H3: The university entrance score is correlated with *conscientiousness*.

## METHODS

### *Participants and Procedure*

Participants were 5,863 students at Baden-Wuerttemberg Cooperative State University. This survey took place in August 2016 as a census of all 34,000 enrolled students and is the first wave of a panel study (Deuer, Wild, Schäfer-Walkmann, Heide, & Walkmann, 2017). The aim of this research project was to identify factors for successful cooperative education and to reduce student drop out. Here, a multi-perspective and multi-centric study was performed. In addition to the cooperative students, cooperative partners and lecturers were surveyed as well. This mixed methods research program combined quantitative methods and qualitative methods, such as depth interview. The mean age for participants was 23.08 ($SD$ = 2.97) and the mean university entrance score was 2.20 ($SD$ = .57). The sample consists of 50.3% female participants. Cooperative students were enrolled in the following three schools: Business School (57.9%), School of Engineering (32.3%) and School of Social Work (9.8%).

Participants were recruited in cooperation with university administration at headquarters. Researchers sent an email to all students twice in an interval of two weeks with a link to a questionnaire, inviting them to participate in the survey. Participation was voluntary and privacy policy was adhered. As an incentive for participation, every 50th student who answered more than one question, received a coupon worth 10€. Survey data, such as Big Five personality traits, were merged with students' demographic data obtained from university administration.

The percentage of missing values in our data amounted to less than 6% per item. We made an imputation by expectation-maximization-algorithm to estimate missing values (e.g., Peugh & Enders, 2004). An alpha of .05 was used as the cutoff for statistical significance.

*Measure*

Big Five personality traits were measured by a validated ultra-short scale from the instrument Big Five Inventory with 10 items (BFI-10) by Rammstedt, Kemper, Klein, Beierlein, and Kovaleva (2013). It is based on the BFI by John, Donahue, and Kentle (1991) and the median response time is only 80 seconds. The German version of this economic instrument contains 10 questions and two items per factor. General personality-relevant statements are self-rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). In our sample the reliabilities for each dimension were partly at a low level: *extraversion* ($\alpha$ = .77), *agreeableness* ($\alpha$ = .28), *conscientiousness* ($\alpha$ = .53), *neuroticism* ($\alpha$ = .58) and *openness* ($\alpha$ = .55). However, we must note that coefficient alpha has widespread lack of understanding (Cortina, 1993). For example, alpha based on assumption of tau-equivalence. Another way for a reliability check would be to re-measure the Big Five to check retest reliability ($r_{tt}$). This task should be completed in further panel waves. We calculated a confirmatory factor analysis to test validity with excellent fits ($\chi 2$ =36.77; *df* =25; *p* = .061; CFI = 0.99; TLI = .99; RMSEA = 0.01; SRMR = 0.01).

University entrance scores and social class were additional measurements used. German university entrance scores vary between 1 (equivalent to A in Great Britain and United States of America) and 4 (equivalent to E (GB) or D (US)). Social class was measured by a subjective self-report. Students were asked "What social class did you belong to when you were 15 years old?". People could score on a scale between 1 (= lower class) and 10 (= upper class).

RESULTS

Means and standard deviations for the Big Five personality traits are reported in Table 1. Correlations between university entrance scores, social class, age and Big Five personality traits are presented in Table 2. Notably, *conscientiousness* and university entrance scores were weakly correlated (*r* = -.18). *Extraversion* was weakly correlated with *neuroticism* (*r* = -.20) and *openness* (*r* = .15).

TABLE 1: Descriptive statistics of all means and standard deviations of Big Five scales.

| | Mean | SD |
|---|---|---|
| Agreeableness | 3.28 | 0.73 |
| Conscientiousness | 3.66 | 0.80 |
| Extraversion | 3.42 | 0.93 |
| Neuroticism | 2.67 | 0.86 |
| Openness | 3.27 | 0.92 |

*Note:* 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

TABLE 2: Correlations among university entrance scores, social class, age and Big Five.

| | Agreeableness | Conscientiousness | Extraversion | Neuroticism | Openness |
|---|---|---|---|---|---|
| Agreeableness | 1 | | | | |
| Conscientiousness | 0.04 | 1 | | | |
| Extraversion | 0.04 | 0.10 | 1 | | |
| Neuroticism | 0.02 | 0.03 | -0.20 | 1 | |
| Openness | 0.09 | 0.05 | 0.15 | 0.02 | 1 |
| University entrance scores | 0.00 | -0.18 | 0.08 | 0.00 | 0.06 |
| Social class | -0.02 | 0.04 | 0.10 | -0.09 | -0.01 |
| Age | -0.02 | -0.01 | -0.01 | 0.00 | 0.08 |

Table 3 presented the effect of gender and academic field. Means, standard deviations, *t*-tests and analysis of variance were conducted. The results revealed significant effects between gender with *conscientiousness* [$t(5861) = 16.99$; $p <. 001$; $d = .58$] and *neuroticism* [$t(5858) = 11.38$; $p <. 001$; $d = .57$]. Small effects were estimated between gender and *openness* [$t(5861) = 7.80$; $p <. 001$; $d = .30$], *extraversion* [$t(5833) = 21.80$; $p <. 001$; $d = .26$] such as *agreeableness* [$t(5861) = 9.91$; $p <. 001$; $d = .21$]. Statistically significant differences existed between academic field with weak effects in the Big Five personality trait *extraversion* [$F(2, 5860) = 76.89$; $p < .001$; $\eta^2 = .03$].

The research questions assume that personality differences exist between gender and academic field, as well as an interaction. Furthermore, we achieved an effect for differences in university entrance scores, age and social class to personality. We used multivariate analysis of covariance (MANCOVA) to test this hypothesis with multivariate statistics (Tabachnick & Fidell, 2014).

We estimated a 2 x 3 between-subject multivariate analysis of covariance with five dependent variables associated with Big Five personality traits: *agreeableness, conscientiousness, extraversion, neuroticism* and *openness*. We integrated three covariates in our model: university entrance scores, age and social class. Independent variables were gender and academic field.

Results of evaluation of assumptions were satisfactory. The criterion of normal distribution was fulfilled. Multicollinearity was no problem. However, homogeneity of variance-covariance matrices was violated ($p < .001$).

Using Wilks's statistic (Tabachnick & Fidell, 2014), there was a significant effect of gender [$\Lambda = 0.94$, $F(5, 5850) = 75.73$, $p < .001$, partial $\eta^2 = .06$] and academic field [$\Lambda = 0.97$, $F(10, 11700) = 15.99$, $p < .001$, partial $\eta^2 = .01$], but no interaction [$\Lambda = 1.00$, $F(10,11700) = 1.77$, $p = .06$, partial $\eta^2 < .01$]. The covariate

university entrance scores [$\Lambda$ = 0.96, $F$(5, 5850) = 55.33, $p$ < .001, partial $\eta^2$ = .05], age [$\Lambda$ = 0.99, $F$(5, 5850) = 12.03, $p$ < .001, partial $\eta^2$ = .01] and social class [$\Lambda$ = 0.98, $F$(5, 5850) = 18.69, $p$ < .001, partial $\eta^2$ = .02], were significant to Big Five personality traits.

To investigate the power of the covariates more specifically, multiple regressions were run for each dependent variable in turn, with covariates and dependent variables acting as multiple predictors. Only age reached statistical significance for *agreeableness* ($b$ = -.01, $p$ = .02). All covariates reached statistical significance for *conscientiousness.* In detail this was age ($b$ = .02, $p$ < .001), university entrance scores ($b$ = -.29, $p$ < .001) and social class ($b$ = .03, $p$ = .001). University entrance scores ($b$ = .10, $p$ < .001) and social class ($b$ = .06, $p$ < .001) had a significant effect to *extraversion*. Only social class was significant ($b$ = -.05, $p$ < .001) for Big Five personality trait *neuroticism*. The covariate age ($b$ = .02, $p$ < .001) and university entrance scores ($b$ = .05, $p$ = .03) were significant to personality trait *openness.*

After adjusting the covariates and Bonferroni correction (Field, 2009, p. 373), female students scored in all Big Five personality traits significantly higher than male students (*agreeableness*: $p$ < .001, $d$ = .11; *conscientiousness:* $p$ < .001, $d$ = .29; *extraversion*: $p$ < .001, $d$ = .10; *neuroticism*: $p$ < .001, $d$ = .33 and *openness*: $p$ < .001, $d$ = .17). Just as well, students in the various academic fields show significant differences. On *agreeableness,* students in School of Social Work scored significantly higher than students in Business School ($p$ < .001, $d$ = .26) and School of Engineering ($p$ = .012, $d$ = .14). You can see these results in Figure 2. Furthermore, students in School of Engineering scored also significantly higher than students in Business School ($p$ < .001, $d$ = .12). In contrast, students in Business School scored significantly higher than students in School of Engineering in *conscientiousness* ($p$ = .001, $d$ = .10). Big Five personality traits *extraversion* shows that students in School of Engineering scored significantly lower than students in Business School ($p$ < .001, $d$ = .23) and School of Social Work ($p$ < .001, $d$ = .22). In School of Engineering students scored significantly higher than in Business School at *neuroticism* ($p$ < .001, $d$ = .05). Finally, Big Five personality trait *openness* results showed students in Business School scored significantly lower than students in School of Engineering ($p$ < .001, $d$ = .12) and School of Social Work ($p$ = .001, $d$ = .18).

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TABLE 3: Big Five means and standard deviation of Gender and Academic field (incl. t-test respectively analysis of variance).

| | | n | Agreeableness | | Conscientiousness | | Extraversion | | Neuroticism | | Openness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Gender | Women | 2947 | 3.35 | 0.72 | 3.83 | 0.76 | 3.54 | 0.92 | 2.91 | 0.86 | 3.40 | 0.93 |
| | Men | 2916 | 3.20 | 0.74 | 3.48 | 0.80 | 3.30 | 0.93 | 2.44 | 0.79 | 3.13 | 0.90 |
| | | | $t(5861) = 9.91$; $p < .001$; $d = .21$ | | $t(5861) = 16.99$; $p < .001$; $d = .58$ | | $t(5833) = 21.80$; $p < .001$; $d = .26$ | | $t(5858) = 11.38$; $p < .001$; $d = .57$ | | $t(5861) = 7.80$; $p < .001$; $d = .30$ | |
| Academic field | Business School | 3393 | 3.24 | 0.73 | 3.71 | 0.79 | 3.51 | 0.92 | 2.67 | 0.87 | 3.24 | 0.95 |
| | School of Engineering | 1894 | 3.28 | 0.75 | 3.56 | 0.80 | 3.21 | 0.94 | 2.62 | 0.84 | 3.24 | 0.88 |
| | School of Social Work | 576 | 3.49 | 0.66 | 3.68 | 0.81 | 3.60 | 0.85 | 2.85 | 0.84 | 3.53 | 0.83 |
| | | | $F(2,5860) = 29.92$; $p < .001$; $\eta^2 = .01$ | | $F(2,5860) = 21.14$; $p < .001$; $\eta^2 = .01$ | | $F(2,5860) = 76.89$; $p < .001$; $\eta^2 = .03$ | | $F(2,5860) = 15.76$; $p < .001$; $\eta^2 = .01$ | | $F(2,5860) = 26.81$; $p < .001$; $\eta^2 = .01$ | |

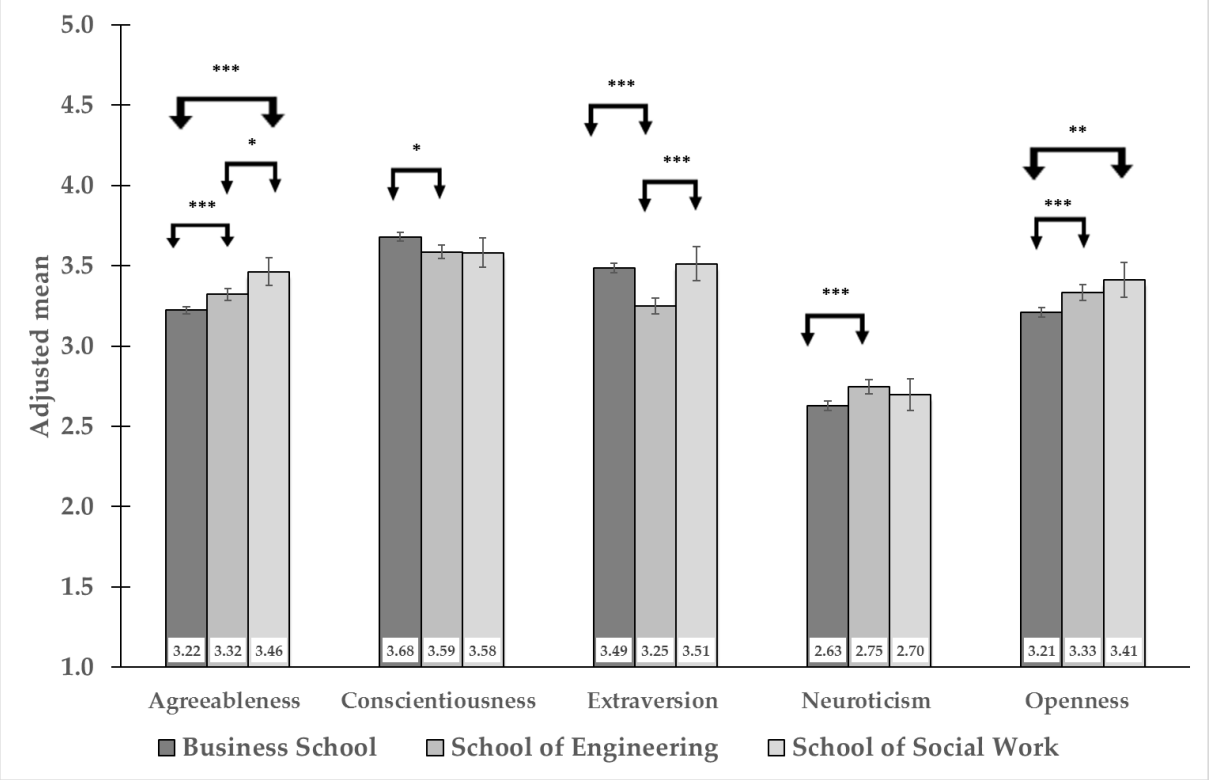


FIGURE 2: Adjusted mean values and 95% confidence interval on the Big Five personality traits with controlled covariate university entrance score, age and social class in a MANCOVA. * $p < .05$; ** $p < .01$; *** $p < .001$.

## DISCUSSION

This is one of the few studies to examine the correlations between demographic variables and Big Five personality traits among students of cooperative education. The results showed consistencies with past research, but other interesting new results were found as well.

The present study showed that gender seems to have a big effect on Big Five personality traits. Female students consistently scored higher than male students. These results support hypothesis 1, that female students are more agreeable, conscientious and neurotic (Rubinstein, 2005; Vedel et al., 2015). Female students also had higher scores on *extraversion* and *openness.* One interpretation of this finding could be that companies search and select these special character-types in female cooperative students in assessment-centers, because these characteristics correlate with success on the job, especially in the area of sales (Tett & Christiansen, 2008). Another explanation is that female students with this personality trait identify more with the concept of alternating periods of academic studies and on-the-job training.

Hypothesis 2 was partially supported. Students in Business School scored lowest in *agreeableness,* and *agreeableness* was highest scored in School of Social Work. Results showed also that students from School of Engineering scored lowest in *extraversion* and students from Business School scored lowest on *openness*. We can interpret these finding based on the disciplines' self-concept. Social work is traditionally seen as a helping profession (Higham, 2006). So, it is no surprise that these people scored high on *agreeableness* and *openness*. Economics, the study of the allocation of scarce resources

to satisfy competing aims (Becker, 2008), integrates rational thinking, processes and rationality. So, it is also no surprise that these students scored low on *openness*, because they must remain only partly open for innovation, new ideas and processes. Students of the School of Engineering, who were taught in requirements for innovation in technology (Acatech, 2013), did not receive results much different from the students of the other fields of study. Only on one dimension, *extraversion,* students of engineering scored the lowest.

The results of this study support hypothesis 3, that is University Entrance scores have a big influence on *conscientiousness*. Furthermore, *openness* and *extraversion* had an effect. These correlations are already suggested by Trapmann et al. (2007). The high effect of *conscientiousness* can be explained. Personality traits cover many facets for academic performance, like being organized, systematic, efficient, orderly and consistent. These personal traits have an explicit behavioral meaning (De Raad & Schouwenburg, 1996). Many researchers identify non-cognitive factors in learning and education, like perseverative behavior, volitional behavior, and inertia. Researchers argue how *conscientiousness* causes better grades in relation to general mental ability. Results support the hypothesis of a non-interactive effect of general mental ability and *conscientiousness* in the work domain (Trapmann et al., 2007).

The covariates age and social class have an effect on personal traits. Meanwhile researchers have shown in longitudinal studies effects of age on Big Five personality traits (Harris, Brett, Johnson, & Deary, 2016). This could be an indicator for socialization. Our research supports the findings that social class influences Big Five personality traits. Lundberg (2013) reports similar results. We can attempt to interpret these results within the discussion about educational opportunity. For example, students from a lower social class scored lower on *conscientiousness,* which is a recognized determinant factor for academic performance.

Further research is important as student generations grow up with opportunities and experiences different from their parents, to include social networks and digitalization (Anderson, 2008; Voogt & Knezek 2008). These changes could have affected the personality traits of this new generation and even their actions. Within this framework, the current state of research could be replicated and validated, for example on today's cooperative students.

In addition, we helped to consolidate Bourdieu's theory. The assumption that subjects differ in academic majors, because of social capital, economic capital and cultural capital and the links to social reproduction, is confirmed (Bourdieu, 1984). Georg, Sauer, and Wöhler (2009) show the same in Germany for different lifestyles in students in science, sociology, and law. In cooperative education Wild and Neef (2019) demonstrate differences between academic majors of engineering and business administration of basic needs based on self-determination theory.

This study can be seen as a starting point for further research. First, these results could help with the development of new theoretical approaches in cooperative education, as Deuer and Wild (2018) have demonstrated for students´ drop out in cooperative education. It would be conceivable to elaborate which influence has Big Five in learning settings and finally on success as well as drop out of the cooperative students. Here it would be interesting to develop models that trace a process and integrate the Big Five as a character.

*Practical Implication*

Results show that specific personalities dominate in different academic fields. So, companies could select students with a special type of personality, which is beneficial for their working field. Companies can thus reduce drop-out rates and prevent mental stress, such as burn-out or effort-reward imbalance.

This study can be used as a starting point to compare cooperative students with these other types of study. Furthermore, the results could be used for recruiting cooperative students. If students were selected in accordance with characteristics suitable to their major, then satisfaction could increase. Baden-Wuerttemberg Cooperative State University Loerrach leads a project entitled 'Reduction of Dropout Rates and Sustained Promotion of Employability' ('Verringerung von Studienabbrüchen und nachhaltige Förderung der Employability'), which currently focuses on closer cooperation with the corporate partners. The findings could provide important ground work for these types of cooperation.

*Limitations*

There are a number of limitations to be addressed and discussed. The study design was cross-sectional, so no causal relations among the study variables could be drawn. The findings should be confirmed by prospective cohort studies in the future. Also, some data were obtained through self-reported questionnaires, which could have introduced response bias. Though some important socio-demographic factors were included in this research, other factors, such as academics year or campus, were not considered. Given the study sample, the results should be generalized with caution. More research should be conducted in other regions and nations.

## CONCLUSION

Our research makes an important contribution towards the understanding of cooperative education, especially in the context of gender and academic field. Future research could integrate other study programs, because existing research indicates that students of these programs differ from students of cooperative education. Given the present identified correlations between *conscientiousness* and performance it would be interesting to explore the stability of this trait as an important personal characteristic. Universities and companies may be able to use these results to aid the selection of cooperative students.

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