Associations between academic dishonesty and personality: A pre-registered multilevel meta-analysis

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Abstract

Academic dishonesty—the inclination to cheat, fabricate, falsify, and plagiarize in an academic context—is a highly prevalent problem with dire consequences for society. The present meta-analysis systematically examined associations between academic dishonesty and personality traits of the Big Five, the HEXACO model, Machiavellianism, narcissism, subclinical psychopathy, and the Dark Core. We provide an update and extension of the only meta-analysis on this topic by Giluk and Postlethwaite (2015), synthesizing in total 89 effect sizes from 50 studies—containing 38,189 participants from 23 countries. Multilevel meta-analytical modelling showed that academic dishonesty was positively correlated with the dark traits, and negatively correlated with openness, conscientiousness, agreeableness, and honesty-humility. The moderate-to-high effect size heterogeneity—ranging from $I^2 = 57\%$ to 91% —could only be partially explained by moderator analyses. The observed relationships appear robust with respect to publication bias and measurement error, and can be generalized to a surprisingly large scope (across sexes, continents, scales, and study quality). Future research needs to examine these associations with validated and more nuanced scales for academic dishonesty.

Key words: academic dishonesty; personality; Big Five; dark triad; meta-analysis; honesty-humility; HEXACO

1. Introduction

1.1 Academic Dishonesty

Academic dishonesty is a highly prevalent and problematic behavior that can be defined as a student's use of unauthorized assistance with intent to deceive those who evaluate the student's work. Academic dishonesty primarily entails cheating—the use of unauthorized information during an exam; fabrication—the invention of information; falsification—the manipulation of results; and plagiarism—the use of ideas or words without appropriate acknowledgement (Velliaris, 2016).

This inclination to cheat, fabricate, falsify, and plagiarize in an academic context is not only alarming due to its high prevalence, with estimates ranging from 27% (Korn & Davidovitch, 2016) to 76% (Davis, Grover, Becker, & McGregor, 1992), but especially because students with such inclinations are more likely to continue these unethical behaviors at work (Harding, Carpenter, Finelli, & Passow, 2004; Nonis & Swift, 2001). A continuation of these behaviors outside the educational setting in a scientific career can have dire consequences for science as a whole, ranging from clinical decisions jeopardizing patients' health, a waste of resources on unproductive research avenues, and reduced public trust in science. In particular, data fabrication, research fraud, and the use of questionable research practices have decreased the trustworthiness of empirical research substantially (Anvari & Lakens, 2019; Fanelli, 2009; John, Loewenstein, & Prelec, 2012; Stürmer, Oeberst, Trötschel, & Decker, 2017). Since research integrity is essential for the credibility of science, understanding the extent to which personality predicts these types of unethical academic behaviors is crucial for developing effective interventions.

1.2 Personality

Personality traits are defined as relatively enduring, automatic patterns of cognitions, emotions, and behaviors that are relatively consistent across a wide variety of situations and contexts (Allport, 1961; McCrae & Costa Jr, 2003; Roberts, 2009; Spengler et al., 2015). Numerous theories have been proposed on the structure of personality (Drapela, 1995) but the most commonly used personality trait framework is the Big Five (John, Naumann, & Soto, 2008) or Five-Factor Model (McCrae & Costa Jr, 1999), which includes five broad traits: openness to experience (O), conscientiousness (C), extraversion (E), agreeableness (A), and neuroticism (N).

Individuals who score high in openness tend to be more open to feelings, emotions, imagination, aesthetic experiences, and political and philosophical liberalism. Highly conscientious individuals tend to be perceived as more competent, orderly, dutiful, self-disciplined, and deliberate than individuals with low conscientiousness. Extraversion refers to the tendency to prefer stimulating environments, overall greater activity, and an inclination to seek social interactions. Individuals who score low in extraversion do so to a lesser extent. Highly agreeable people tend to get along well with others and are perceived as kind, sympathetic, cooperative, warm, and considerate, while those who score low in agreeableness are perceived as rather cold, selfish, and lacking empathy. People who score high in neuroticism tend to be less emotionally stable, are more vulnerable to stress, experience more anxiety, sadness, and self-consciousness compared to individuals who score low in neuroticism (Costa Jr & McCrae, 1992; John et al., 2008; McCrae & Costa Jr, 1989, 1999; Strus, Cieciuch, & Rowiński, 2014).

Big Five personality traits are associated with occupational interests, occupational involvement, and academic success (Poropat, 2009). In particular, academic performance was found to correlate with agreeableness, conscientiousness, and openness to experience. Therefore, these personality traits appear to be associated with desirable academic outcomes

and are consequently of particular interest for the current meta-analysis, as those who are already successful in the academic world might not need to rely on cheating or plagiarizing to accomplish their goals.

The HEXACO model of personality adds another dimension to the structure of human personality—honesty-humility—resulting in six dimensions of personality, or the Big Six: Honesty-humility (H), emotionality (E), extraversion (X), agreeableness (A), conscientiousness (C), and openness to experience (O) (Ashton et al., 2004). Consequently, honesty-humility measures especially important domains of personality for the understanding of academic dishonesty: Sincerity, fairness, greed avoidance, and modesty.

The Dark Triad refers to the three most important malevolent personality traits—Machiavellianism, narcissism, and subclinical psychopathy (Muris, Merckelbach, Otgaar, & Meijer, 2017; Paulhus & Williams, 2002). Even though all three Dark Triad traits are distinct dimensions, evidence suggests that they are overlapping on a “Dark Core” (Bertl, Pietschnig, Tran, Stieger, & Voracek, 2017; Book, Visser, & Volk, 2015; Jones & Figueredo, 2013; Moshagen, Hilbig, & Zettler, 2018; Tran et al., 2018). This Dark Core and its traits are characterized by the inclination to maximize one’s status, monetary payoffs, as well as feelings of power, or superiority, even at the cost of others (Moshagen et al., 2018). Therefore, they are of particular interest for understanding academic dishonesty, additionally to the Big Five/Six trait frameworks.

More concretely, Machiavellianism refers to the tendency to manipulate and exploit others in the pursuit of one’s goals, an absence of morality, callousness, and being incentivized primarily by self-interest (Jakobwitz & Egan, 2006; Paulhus & Williams, 2002). Narcissism is characterized by grandiosity, pride, egotism, and a lack of empathy, while psychopathy is characterized by antisocial behavior, impulsivity, and selfishness (Paulhus & Williams, 2002). These traits are closely associated with ethically and socially aversive

beliefs and behaviors, and predict a wide range of undesirable psychosocial outcomes. People who score high on these traits tend to be more aggressive and violent (Dinić & Wertag, 2018; Knight, Dahlen, Bullock-Yowell, & Madson, 2018; Paulhus, Curtis, & Jones, 2018), show more counterproductive behaviors in the workplace (Grijalva & Newman, 2015; O’Boyle, Forsyth, Banks, & McDaniel, 2012; Scherer, Baysinger, Zolynsky, & LeBreton, 2013; Spain, Harms, & Lebreton, 2014; Spurk, Keller, & Hirschi, 2016), have strong motives for self-enhancement, achievement, power, and money (Balakrishnan, Plouffe, & Saklofske, 2017; Jonason & Ferrell, 2016; Kajonius, Persson, & Jonason, 2015; Lee et al., 2013), and have lower life satisfaction as well as lower growth-oriented outcomes (Kaufman, Yaden, Hyde, & Tsukayama, 2019). Thus, these dark personality traits—the Dark Triad and the Dark Core—appear highly relevant in understanding academic dishonesty.

Associations among some of the discussed personality traits are also of interest for the current investigation. For example, the Dark Triad is negatively related to agreeableness (Jakobwitz & Egan, 2006; Jonason, Kaufman, Webster, & Geher, 2013), conscientiousness (Jakobwitz & Egan, 2006; Paulhus & Williams, 2002), and honesty-humility (Book et al., 2015; Hodson et al., 2018). The negative pole of honesty-humility closely resembles the Dark Core since it encapsulates the tendency to manipulate and exploit others for personal gain (Book et al., 2015; Lee et al., 2013). We therefore synthesized the results of studies investigating the relationship between academic dishonesty and honesty-humility (reverse coded) and the Dark Triad in our analysis.

1.3 Present Study

The central question we address in this meta-analysis is the magnitude of associations between academic dishonesty—cheating, plagiarizing, and unauthorized help—and the personality traits captured by the Big Five, HEXACO, and Dark Triad. A previous meta-analysis by Giluk and Postlethwaite (2015) investigated the relationship of academic

dishonesty with the Big Five traits (Costa & McCrae, 1987). Particularly, they reported associations between academic dishonesty and conscientiousness as well as agreeableness, $r = -.18$ and $r = -.11$, respectively.

We conduct the first meta-analysis investigating how personality domains, such as the honesty-humility factor of the HEXACO model of personality (Ashton et al., 2004), or “dark” aspects of personality, i.e., the Dark Triad (Paulhus & Williams, 2002), relate to academic dishonesty. We were therefore interested in answering these four central questions:

1. How strong are the associations between academic dishonesty and personality, operationalized using either a Big Five or HEXACO scale?
2. How strong are the associations between academic dishonesty and “dark” personality traits?
3. Can the expected effect size heterogeneity be explained by moderators? Moderators of interest were: a) the scale used to assess academic dishonesty, b) the scale used to assess personality, c) study quality, and d) time period for which the academically dishonest behavior was assessed (e.g., “last semester”, “last year” or “entire academic career”).
4. Do publication bias, measurement error, or questionable research practices (e.g., *p*-hacking) influence these associations?

Concerning these research questions, we had the following hypotheses: 1. We expected associations between Big Five/Big Six personality traits and academic dishonesty. In particular, we predicted that conscientiousness, agreeableness, and honesty-humility were negatively correlated with academic dishonesty. 2. We predicted a positive relationship between the dark personality traits and academic dishonesty.

2. Methods

As reproducibility of meta-analyses is low (Lakens et al., 2017), we decided to follow the six practical recommendations outlined by Lakens, Hilgard, and Staaks (2016). Therefore, (1) our Online Supplementary Material contains documents that disclose all data points used for meta-analytic synthesis and (2) a description of how each effect size was calculated. (3)

PRISMA reporting guidelines were strictly followed, (4) the meta-analysis was preregistered (<https://osf.io/3sm62/>) and all deviations from our analysis plan were made transparent, (5) all data sets and R code to reproduce the results and figures were attached to the preregistration, and (6) both the literature search and the effect size computations were conducted independently by two authors each to ensure their reproducibility.

2.1 Literature Search

We performed a systematic literature search, following the PRISMA statement (Moher et al., 2009). For this purpose, we searched Google Scholar with the following search terms:

Academic Dishonesty OR Academic Integrity OR Cheating OR Plagiarism OR Cyber-Plagiarism AND Personality OR HEXACO OR Big Five OR Big 5 OR Dark Triad OR Dark Core OR Light Triad OR Dark Tetrad OR Narcissism OR Psychoticism OR Machiavellism.

The first 1,000 resulting studies were included in the title and abstract screening.

We complemented these searches with both forward and backward searches based on the identified papers from the previous step.

We considered grey literature (unpublished data, theses, dissertations, conference presentations) and studies not published in English, which were subsequently translated using Google Translate. Meta-analyses that include grey literature are less likely to over-represent studies with statistically significant findings, inflate effect size estimates, and provide less precise effect size estimates than meta-analyses excluding grey literature (Conn, Valentine, Cooper, & Rantz, 2003).

2.2 Eligibility and Coding Procedure

Studies identified in the literature search were eligible for the meta-analysis based on the following criteria: The study (1) covered associations between personality and academic dishonesty, (2) personality was assessed with a psychometrically valid scale for a HEXACO, Big Five, or “dark” trait, and (3) all relevant statistical information was reported in the paper

or could be retrieved by contacting the authors. Any contact with authors was made transparent and, if possible, the obtained data was also shared.

[Data for this preprint was obtained by a single coding of the included studies. For the final paper, the screening of title, abstract, and full texts—as well as data extraction—will be performed by two researchers independently from each other. Inter-rater reliability will be calculated using Cohen’s Kappa/ICC and will be reported. Ambiguous cases will be discussed until a consensus is reached.]

All relevant details about the number of papers that were screened, excluded, and included are provided in a PRISMA Flow Diagram, i.e., reasons for the exclusion of studies that were initially included based on the title and abstract screening.

The coding scheme was based on the coding scheme recommended by Lakens et al. (2017) (<https://osf.io/q23ye/>). We extracted information on study identifiers (authors, year of publication, DOI), sample description (sample size, country of the sample, mean age, sex), scales for personality and academic dishonesty, coding quality (confidence ratings), effect sizes (correlations), reliabilities for all scales, and study quality (regarding representativeness, sample size justification, measurement quality). The coding scheme is attached to the Online Supplementary Material We describe the extracted data items in our coding manual in greater detail, which is attached to the coding scheme.

Each included study was given a unique study ID and effect size ID to allow easy tracking. Coders of the studies received unique identifiers and confidence in each coded study was recorded. In case of missing data, we contacted the authors and performed a sensitivity analysis.

2.3 Summary Measures

Separate meta-analyses were conducted for each of the Big Five traits, honesty-humility (HEXACO), and the Dark Triad traits. Additionally, we meta-analyzed the Dark Triad traits

and honesty-humility together, based on the empirical evidence of a unifying Dark Core of the Dark Triad (e.g., Jones & Figueredo, 2013), and the large trait overlap of reversed honesty-humility with the Dark Triad traits (e.g., Hodson et al., 2018). This Dark Core measure was created by calculating a summary effect size containing all traits from the Dark Triad and reverse-coded honesty-humility.

We used a three-level model to account for the dependency of reported effect sizes due to the use of multiple measures of academic dishonesty in some studies. In this model, the sampling variation for each effect size was on level 1, the variation of effect sizes within each study on level 2, and the variation of effect sizes across studies on level 3.

All associations are reported with Pearson's correlation coefficient r . For synthesis, we first converted Pearson's r into Fisher's z ; for the summary effect size, we converted the aggregated Fisher's z scores back into r . We consider an effect size as statistically significant if zero is not included in the confidence interval, and consequently assume no statistically significant effect if zero is included. The strength of the correlation was verbally described using the benchmarks by Lipsey and Wilson (2001): $r > .10$ was considered a "small" effect, $r > .25$ a "medium" effect, and $r > .40$ a "large" effect.

We corrected for false discovery rates due to multiple testing in our moderator analyses with the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995), setting $\alpha = .05$. R version 3.5.1 (R Core Team, 2018) and the R package metafor version 2.1.0 (Viechtbauer, 2010) was used for all analyses.

2.4 Publication Bias

We explored publication bias—the tendency that statistically significant results are published more frequently than studies without significant results (Dickersin, 1990)—with multiple methods in order to investigate the robustness of the estimated overall effect sizes.

We conducted Egger's regression test (Egger, Smith, Schneider, & Minder, 1997) and inspected contour enhanced funnel plots to assess potential bias in the included studies. Contour enhanced funnel plots aid the interpretation of funnel plot asymmetry by allowing for the distinction between asymmetry caused by publication bias on the one hand and alternative factors, like study quality or artifacts of sampling variation, on the other hand (Peters, Sutton, Jones, Abrams, & Rushton, 2008).

In addition, PET/PEESE (Precision Effect Test/Precision Effect Estimation with Standard Error; Stanley & Doucouliagos, 2014) analyses were used to evaluate the robustness of the overall effects. This method regresses effect sizes on their standard errors and predicts the effect size for a standard error of zero—a hypothetical study with infinite sample size and perfect measurement.

Lastly, we obtained overall effect size estimates with p -curve (Simonsohn, Nelson, & Simmons, 2014), p -uniform (van Assen, van Aert, & Wicherts, 2015), and p -uniform* analyses (van Aert & van Assen, 2018). In this, we deviate from the preregistration. The recently introduced p -uniform* method corrects for the possible overestimation of the overall effect size in random effects models that is eminent with the p -uniform method. For studies which reported multiple effect estimates for the same effect, PET-PEESE, p -curve, p -uniform, and p -uniform* were based on the averaged effect sizes of these studies.

2.5 Heterogeneity Analysis

We assessed effect size heterogeneity with the Cochran's Q test and the I^2 statistic. For interpreting I^2 values, we employed the benchmarks proposed by Higgins and Thompson (2002): $I^2 < 25\%$ was considered as low, 25-50% as moderate, 50-75% as high, and $I^2 > 75\%$ as very high heterogeneity.

In case of high effect size heterogeneity, we further investigated its origins, utilizing Baujat plots (Baujat, Mahé, Pignon, & Hill, 2002) and moderator analyses. First, we

examined the possible effects of a number of sample characteristics. We conducted a moderator analysis for geographical origin (country) of the samples, as previous studies have reported cultural differences in the prevalence of academic dishonesty (Chapman & Lupton, 2004; McCabe, Feghali, & Abdallah, 2008), as well as percentage of women and mean sample age, as there are known sex and age differences in academic dishonesty (Jensen, Arnett, Feldman, & Cauffman, 2002; Sideridis, Tsaousis, & Al Harbi, 2016; Whitley, Nelson, & Jones, 1999). Next, we investigated the possible moderating effects of the scales that were used to measure personality and academic dishonesty. In order to investigate a potentially moderating influence of study quality, a mean composite score was constructed from four items assessing (1 = *yes*, 0 = *no*) whether the samples were representative (definition of population was given and all subjects were assessed or sample weights were reported), whether the sample size was justified by a-priori power calculations, and whether validated scales were used for personality and academic dishonesty. Additionally, all moderators were evaluated in multiple meta-regression analyses to control for multicollinearity.

2.6 Sensitivity Analyses

Individual studies which contributed disproportionately to the effect size heterogeneity were identified by conducting leave-one-out sensitivity analyses. We iteratively removed one study at a time and recalculated the summary effect sizes. Additional sensitivity analyses were performed after removing studies and data points, which were identified to potentially introduce a risk of bias. If studies were excluded in any of the analyses, this is made transparent.

2.7 Correcting for Measurement Error

We obtained mean effect estimates corrected for the unreliability of the measures by mean-centering the scale reliabilities and including them as predictors in random-effects regression analyses (Hox, Moerbeek, & van de Schoot, 2018). In contrast to the classic

psychometric meta-analysis/Hunter-Schmidt approach, this method does not tend to overestimate the summary effects.

3. Results

3.1 Study Selection and Study Characteristics

We identified 1,425 studies in our systematic literature search and 127 additional records through forward and backward search strategies. In total, 89 effect sizes from 50 studies were included in the meta-analysis for quantitative data synthesis. See Figure 1 for a PRISMA flow chart of the study selection process.

We obtained substantial aggregated sample sizes for the correlations of academic traits with Big Five, Big Six, and dark personality traits. The total sample size was $N = 38,189$. The sample sizes of individual studies ranged from $N = 29$ to $N = 9,543$, with a mean of $N = 429$. Mean age was 21.57 ($SD = 2.72$) and ranged from 15 to 30 years. The mean proportion of women in the samples was 56% and ranged from 1% to 83%. Data came from 23 countries, with the majority of included effect sizes originating from North America (44 effect sizes), Europe (19 effect sizes), and Asia (17 effect sizes). The intercoder reliability between the two coders (intraclass correlations, calculated for descriptive variables age, N , sex, and all correlations) will be described here in the final manuscript and disagreements will be discussed until consensus is reached.

The most important characteristics of all included studies are summarized in Table 1. Our meta-analysis contains 34 additional effect sizes for the Big Five personality traits compared to the previous meta-analysis on this topic (Giluk & Postlethwaite, 2015) and 73 additional effect sizes in total. Furthermore, it is the first meta-analysis investigating the link between dark personality traits and academic dishonesty.

3.2 Associations between Academic Dishonesty and Personality Traits

Results for the correlations between the personality traits and academic dishonesty are presented in Table 2, with the majority being statistically significant.

As hypothesized, conscientiousness, agreeableness, and honesty-humility were negatively correlated with academic dishonesty. Academic dishonesty was positively associated with all traits of the Dark Triad, as well as with the Dark Core.

3.3 Publication Bias

We assessed publication bias by using contour enhanced funnel plots, *p*-curve, PET/PEESE, *p*-uniform*, and Egger's regression test. No indication of publication bias was detected for all but two associations: Egger's regression test was significant for the association between academic dishonesty and conscientiousness as well as neuroticism (see Table 3 and Figures S1-S20). *p*-uniform* analyses yielded results similar to the multilevel model, with a tendency of slightly smaller effect size estimates (Table S1). Conventional random effects *p*-uniform and *p*-curve analyses produced different results, as the number of statistically significant studies was very low for some associations (i.e. $k = 2$ for openness to experience, $k = 5$ for extraversion, $k = 6$ for neuroticism), limiting the usefulness of these methods substantially (Table S1).

3.4 Heterogeneity

For all associations between academic dishonesty and personality traits, we found a moderate to substantial amount of heterogeneity, ranging from $I^2 = 57\%$, $Q(15) = 11.515$, $p = .004$, for the association between Narcissism and academic dishonesty, to $I^2 = 92\%$, $Q(59) = 15.649$, $p < .001$, for the association between conscientiousness and academic dishonesty (see Table 2), indicating a substantial variability of the underlying population effect sizes.

3.5 Sensitivity Analyses

To evaluate the robustness of the associations between academic dishonesty and personality traits, we conducted leave-one-out sensitivity analyses for each personality trait

by iteratively removing one study at a time and recalculating the summary effect sizes. For the most part, the summary effect sizes remained stable (see Online Supplementary Material, R Markdown file), indicating that they were not disproportionately influenced by any single study.

3.6 Moderator Analyses

To investigate the effect size heterogeneity for the summary effect sizes reported in Table 2, we conducted mixed-effects meta-regressions for three moderators (age, sex, and study quality) as well as mixed-effects subgroup analyses for four moderators (type of academic dishonesty assessment, type of personality scale, type of dark trait scale, and continent of study). The following 10 associations remained significant after correcting for false discoveries using the Benjamini-Hochberg method (see Table S2-S6 for detailed information on all moderator analyses).

Age was found to moderate the negative correlation between conscientiousness and academic dishonesty ($F(1, 42) = 10.965, p = .002$; Table S2). In samples with younger participants, the negative correlation between conscientiousness and academic dishonesty was stronger than in samples with older participants.

Study quality was found to moderate the positive correlation between academic dishonesty and psychopathy, ($F(1, 20) = 13.329, p = .002$; Table S2), as well as the Dark Core ($F(1, 54) = 18.871, p < .001$; Table S2). In samples with higher study quality, the correlation between academic dishonesty and psychopathy, as well as the Dark Core, was more pronounced than in samples with lower study quality.

The type of instrument used to assess academic dishonesty moderated effect sizes for six associations (Table S3). Firstly, for self-constructed scales, i.e. ad-hoc scales devised by researchers for a specific study, the associations between all four Dark Triad constructs and academic dishonesty were stronger than for behavioral assessments. Secondly, for validated

measures, the associations of psychopathy and the Dark core with academic dishonesty were stronger than for self-constructed scales.

The utilized assessment tool for dark personality traits moderated the association between the Dark Core and academic dishonesty (Table S5). The association was weaker for samples that used scales assessing the Dark Triad as a whole than for scales assessing individual facets of the Dark Triad.

No moderating effect for the associations between academic dishonesty and personality traits could be observed for sex, continent, and type of personality assessment (Table S2, S4, and S6).

In multiple meta-regression analyses containing all five moderators (age, sex, study quality, type academic dishonesty assessment, and type of personality scale), two moderators remained significant: the influence of age on the association between conscientiousness and academic dishonesty, and the influence of dark personality scales on the association between the Dark Core and academic dishonesty. Table S7 provides the intercorrelations of all continuous moderators (study quality, mean age, % females) with publication year and study *N*.

3.7 Correcting for Measurement Error

Correcting for measurement error by including alpha reliabilities as mean centered predictors in a meta-regression model did not change the outcome of the meta-analyses substantially (Table S1).

4. Discussion

4.1 Summary of Evidence

The present meta-analysis systematically examined the associations between academic dishonesty and personality traits. Synthesizing 89 effect sizes from 50 studies—containing over 38,000 participants—we found that academic dishonesty was positively correlated with

the dark traits, and negatively correlated with openness, conscientiousness, agreeableness, and honesty-humility. Our analyses on the associations between Big Five personality traits and academic dishonesty are consistent with a previous meta-analysis conducted by Giluk and Postlethwaite (2015). Furthermore, we more than tripled the number of included effect sizes on these associations, explored potential sources of effect size heterogeneity, and examined the influence of publication bias with state-of-the-art methods. Additionally, our meta-analysis contains the first synthesis of the associations between academic dishonesty and honesty-humility as well as the Dark Triad—Machiavellianism, narcissism, psychopathy.

Students high in honesty-humility, conscientiousness, agreeableness and openness were less likely to engage in academically dishonest behavior than students who scored low in these traits. Even though honesty-humility had the strongest association with academic dishonesty, this finding is the least robust as only five effect sizes were included in the synthesis. Conscientiousness was the second strongest Big Five trait associated with academic dishonesty, indicating that highly self-disciplined and dutiful students did not display academically dishonest behavior. Agreeableness had a negative relationship with academic dishonesty as well, indicating that high scores in facets such as compliance, trust, and altruism apparently lowers the likelihood of academic dishonesty. Students scoring high in openness tend to be more curious, open-minded, interested in complex problems, and open towards learning new information, resulting in higher academic achievement (Gatzka & Hell, 2018). Therefore, it might be the case that more open individuals do not need to cheat, plagiarize, and falsify in order to improve their grades as much as less open students. Yet, openness was also the weakest negative predictor of academic dishonesty.

Highly neurotic individuals are characterized by higher levels of stress and lower confidence, which might result in poorer academic performance and consequently a need to avoid real or imagined failure—potentially via academically dishonest behavior. However,

congruent with the previous meta-analysis by Giluk and Postlethwaite (2015), neuroticism (and extraversion) was not found to be related with academic dishonesty, despite early research emphasizing the role of these traits in academically dishonest behavior.

However, neuroticism and extraversion should not be ignored in future research on academic dishonesty altogether. There might be multiplicative effects of these (and other) personality variables (i.e., interactions). For example, high levels of extraversion were found to amplify the relationship between low honesty-humility and workplace deviance (Oh, Lee, Ashton, & de Vries, 2011). This could translate to academic dishonesty as well. Oh et al. (2011) argue that “it seems plausible that dishonest, selfish, and greedy individuals (those with low honesty-humility) are more harmful and deviant when they are extraverts rather than introverts because they generally have high levels of social boldness (risk taking) and social skills needed to initiate deviant behaviors ... and to escape punishment or embarrassment when caught as long as the deviant behavior in question is neither illegal nor serious” (p. 503). Thus, investigating multiplicative effects of extraversion or neuroticism might reveal further important insights into the correlates of academic dishonesty, even though these traits tend not to be associated with academic dishonesty on their own.

Students scoring high in the Dark Triad were more likely to cheat, plagiarize, and falsify, than students who were low in these traits, which is unsurprising since these traits capture the inclination to maximize one’s own status and success at the cost of others (Moshagen et al., 2018). Psychopathy was most strongly associated with academic dishonesty, indicating the important role of the inclination for antisocial behavior, impulsivity, and selfishness (Paulhus & Williams, 2002) in the pursuit of one’s academic goals. The second strongest relationship was found for Machiavellianism, pointing out the important contribution of a tendency to manipulate others in the pursuit of one’s goals and of being incentivized primarily by self-interest towards academic dishonesty (Jakobwitz & Egan, 2006; Paulhus & Williams, 2002).

Narcissism was the least strong predictor of academic dishonesty, indicating a slightly less important role of the inclination for grandiosity, pride, egotism, and a lack of empathy for academic dishonesty.

The medium-to-high between-study heterogeneity could only be partially explained. Moderating effects of age suggest that higher conscientiousness might be a stronger buffer against academic dishonesty in younger than in older participants. Studies with higher study quality found stronger associations between academic dishonesty and psychopathy as well as the dark core, indicating that the true effect size might be even larger if more high-quality studies were included. Both self-constructed and validated scales for academic dishonesty yielded stronger associations between academic dishonesty and dark personality traits than behavioral assessments, indicating that behavioral measurements might either underestimate or self-reports might overestimate the associations. Yet, it is too early to derive a conclusion from these findings, as there is a clear lack of studies measuring academic dishonesty behaviorally (there were only 4 studies) and since the majority of the included studies employed self-report measures. The association between the Dark Core and academic dishonesty was weaker when the Dark Triad was assessed in its entirety with short scales (the SD3) than when individual facets of the Dark Triad were assessed. Following the recommendation of Giluk and Postlethwaite (2015) to evaluate the influence of the utilized personality trait measures, we did not detect similar differences between short and long versions of the Big Five personality scales.

4.2 Limitations, Future Research, and Conclusions

Certain limitations have to be taken into account when interpreting the results of the current meta-analysis. As academic dishonesty was measured mainly with self-reports, the tendency to report academic dishonesty in a socially desirable way (i.e., underreporting academic dishonesty) seems likely. Therefore, the context of test-taking and the wording of

the questions might have contributed to the high between-study heterogeneity: Admitting to engaging in academic dishonesty might be less likely if participants were afraid of repercussions. Thus, being asked about current cheating behavior instead of past behavior (Williams, Nathanson, & Paulhus, 2010) or being asked by a lecturer instead of an unknown researcher might have had an effect on study results. Consequently, our findings might reflect lower bounds of the true relationships between personality and academic dishonesty.

Even though there are several validated scales for the assessment of academic dishonesty, many studies used either self-constructed scales, or substantially modified version of existing measures. Despite the fact that this practice is highly prevalent, it is also highly problematic as it is thus impossible to evaluate the validity of the studies' conclusions in a systematic way (Flake & Fried, 2019).

Future research could be improved, as already suggested by Giluk and Postlethwaite (2015), if only scales that also define timeframes for the occurrence of academically dishonest behaviors were used. This would have enabled us to conduct an important moderator analysis on the time period in which academic dishonesty occurred.

To allow a more nuanced examination of Dark Triad traits, it would be necessary for studies to report more than just a composite score for each trait, as Machiavellianism, narcissism, and psychopathy are multidimensional constructs (Miller, Vize, Crowe, & Lynam, 2019). Additionally, this would enable more nuanced moderator analyses on the subscales of academic dishonesty—cheating, plagiarism, and falsification.

In a nutshell, we found a positive relationship between academic dishonesty and Dark Triad traits, and a negative relationship between academic dishonesty and honesty-humility, agreeableness, conscientiousness, and openness. In order to investigate the high effect-size heterogeneity found in the current meta-analysis, more fine-grained moderator analyses would be imperative. With this in mind, more complete reporting, i.e., following open data

489 and open code guidelines, and disclosing more detailed information about the period of time
490 over which the occurrence of academic dishonesty was measured in the study, would be
491 desirable in future research. Furthermore, the research field could greatly benefit from
492 exclusive use of established and validated scales to assess academic dishonesty.

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Tables

Table 1

Study information (author, year, country, mean age, percentage of females, scales, sample size, effect size, and study quality).

ID	Authors, Year	Country	Age	% Female	AD Scale	Personality Scale	Dark Triad Scale	Sample Size	O	C	E	A	N	H	NARC	MACH	PSYC	Quality
1	Aslam & Nazir, 2011	Pakistan	23	33	SC	TIPI	NA	932	-.054	-.038	.022	.020	-.034					1
2	Baran, 2018	Poland	23	74	SC	NA	TRIPM	390									.230	0
3	Barbaranelli et al., 2018	Italy	22	68	CB	NA	MPS	223								.215		0
4	Baughman, Jonason, Lyons, & Vernon, 2014	Canada	19	72	SC	NA	SD3	462							.173	.255	.220	0
5	Bhutto & Mamdani, 2019	Pakistan	NA	1	PS	BFI	NA	231	.191	.113	.154	.259	-.029					1
6	Brunell, Staats, Barden, & Hupp, 2011	USA	20	56	SC	NA	NPI	99							.230			1
7	Cazan & Iacob, 2017	Romania	23	68	ADS	HEXACO	NA	200	-.478	-.180	.046	-.241	.241	-.370				2
8	Clariana, 2013	Spain	24	59	EDA	BFI10	NA	620	-.018	-.243	.084	-.155	-.126					0
9	Clark, 2011	USA	20	57	ADI	NEO-PI	NA	251	-.183	-.317	.033	-.292	.165					2
10	Clause, 2004	USA	22	66	SR-DBQ	ECS, IAT	NA	147		-.030								1
11	Coyne & Thomas, 2008	UK	21	75	SC	NA	LSRP, LSRP	234									.150	0
12	Curtis, 2013	USA	19	72	SC	BFI	NPI, MACH-IV, PPI-SF	29										1
13	de Bruin & Rudnick, 2013	South Africa	21	79	SC	BTI	NA	683		.205								1
14	de Vries, de Vries, & Born, 2011	Netherlands	18	79	ICB	HEXACO-PI-R, MPT-BS	NA	226	-.010	-.429	.010	-.186	-.107	-.342				2
15	Donat, Dalbert, & Kamble, 2014	India	15	50	DAI	BFI-SV	NA	203					-.003					1
16	Eshet, Grinautski, Peled, & Barczyk, 2015	USA	26	NA	AII	TIPI	NA	757	-.061	-.055	-.011	-.086	-.040					1
17	Faulkner, 2012	USA	22	51	SC	NA	NPI	195							.085			0

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18	Fezatte, 2009	Canada	30	59	ADS	NEO-PI-R	NA	310	-.140	-.235	.065	-.240	-.030				1
19	Gallagher, 2010	USA	21	77	AIA	NEO-FFI	NA	210	.180	.030	.130	.040	.170				1
20	Gunawan & Pramadi, 2018	Indonesia	NA	NA	AIS	BFI	NA	535		-.198							1
21	Hendy, 2017	USA	21	62	ADI	IPIP, OPQ32r	NA	299		-.165	.065	.045	-.045				2
22	Hendy & Biderman 2019	USA	21	62	ADI	IPIP	NA	299		-.165	.135						2
23	Hendy & Montargot, 2019	France	22	71	ADI	IPIP	NA	178		-.380							1
24	Jackson, Levine, Furnham, & Burr, 2002	UK	22	47	SRCQ	EPQ-R	NA	150			-.040		.110				1
25	Karim, Zamzuri, & Nor, 2009	Malaysia	19	70	ITADS	Goldberg	NA	252	.043	.159	.085	.114	.105				0
26	Kisamore, Stone, & Jawahar, 2007	USA	NA	NA	AII	HPI	NA	217		-.190			-.180				1
27	Lewis & Zhong, 2011	USA	NA	NA	SC	TRAQSP	NA	908	.007	.036	.033	.015	.026				1
29	Marsden, 2008	Australia	NA	70	SC	NA	LSRP	9543							.250		2
30	Masood & Mazahir, 2015	Pakistan	20	50	ADQ	TIPI	NA	100	-.220	-.380	.003	-.110	.037				1
31	Nathanson, Paulhus, & Williams, 2006	USA	NA	64	Behavioral	BFI, NA	NPI, Mach-IV, SRP-III, PPI	291	-.071	-.057	.021	-.004	.050	.006	-.033	.211	1
32	Nguyen & Biderman, 2013	USA	21	62	ADI	IPIP	NA	299	-.110	-.170	.100	-.080	-.130				2
33	Peled, Eshet, Barczyk, & Grinautski, 2019	USA/Israel	27	69	AII	TIPI	NA	2475	-.096	.135	-.028	.174	-.102				3
34	Ramirez-Correa, 2017	Chile	22	52	SC	FFM	NA	106	-.235	-.132	-.193	-.056	.178				2
35	Romanek, 2009	USA	22	1	SC	NA	NPI	106						.251			2
36	Salgado et al., 2015	Western Europe	NA	71	SC	NEO-PI-R + IP/5F	NA	406	-.010	-.190	-.210	-.140	.000				1

ACADEMIC DISHONESTY AND PERSONALITY: A MULTILEVEL META-ANALYSIS																	13
37	Scrimshire, Stone, Kisamore, & Jawahar, 2017	USA	24	NA	SC	HPI	NA	105	-.384							1	
38	Siaputra, 2013	Indonesia	NA	NA	APS, PEPS	IPIP	NA	362	-.195							2	
39	Sohrabi, Gholipour, & Mohammadesmaeili, 2011	Iran	NA	NA	SC	FFM	NA	180	-.209							0	
40	Stanescu & Iorga, 2013	Romania	21	1	ADQ	NEO-PI-R	NA	252	-.035	-.212	.032	-.095	.122			2	
41	Stone, Jawahar, & Kisamore, 2010	USA	22	51	SC	HPI	NA	241	-.220						.105	1	
42	Stone & Kisamore, 2007	USA	NA	58	SC	HPI	NA	217	-.190						.180	1	
43	Sugiariyanti & Swaraswati, 2017	Indonesia	NA	1	SC	BFI	NA	320	-.273	-.392	-.259	-.341	.079			1	
44	Ternes, Babin, Woodworth, & Stephens, 2019	Canada	21	79	ABQ	NA	SD3	320							.213	1	
45	van Rensburg, de Kock, & Derous, 2018	South Africa	23	1	CAB	HEXACO-PIPI	NA	308							-.265	2	
46	Wilks, Cruz, & Sousa, 2016	Portugal	21	76	SC	NEO-PI-R	NA	373	-.065	-.161	-.010	-.342	.069			1	
47	Williams, Nathanson, & Paulhus, 2010	Canada	NA	67	SC, Turn-it in, SRCS	BFI	NPI, Mach-IV, SRP-III	228							.499	2	
48	Williams, 2007	Canada	NA	68	CMI, Turn-it-In, SRCS	BFI	NPI, Mach-IV, SRP-III	228							.487	2	
49	Zhang, Paulhus, & Ziegler, 2018	China	20	83	SRACBS	BFI	SD3	634	-.030	-.070	.090	-.100	.000	.150	.120	.210	2
50	Zimny, Robertson, & Bartoszek, 2008	USA	19	51	SC	NA	MS	139							.375	2	
51	Kalia & Deep, 2011	India	NA	50	ACS	MPI	NA	400							.136	.153	3

Note. Age = mean age; NA = not available; % Female = proportion of female participants; AD Scale: SC = self-constructed, ABQ = Academic Behavior Questionnaire, ACS = Academic Cheating Scale, ADI = Academic Dishonesty Inventory (Lucas & Friedrich, 2005), ADQ = Academic Dishonesty Questionnaire, ADS = Academic Dishonesty Scale, AIA = Academic Integrity Assessment, AII = Academic Integrity Inventory, AIS = Academic Integrity Scale, APS = Academic Practices Survey, CAB = Counter-Academic Behavior measured with ICB, CB = Cheating Behavior, CMI = Comprehensive Misconduct Inventory, DAI = 4 item subscale Situational Control through Avoiding and Cheating, EDA = Clariana and Martín (2008), ICB = Inventory of Counterproductive Behavior, ITADS = Internet Triggered Academic Dishonesty, PEPS = Personal Experiences with Plagiarism Scale, PS = Plagiarism Survey, SR-DBQ = School-related dishonest behavior questionnaire, SRACBS = Self-Report Academic Cheating Behavior

Scale, SRCQ = Self-Report Cheating Questionnaire , SRCS = Self-Report Cheating Scale; Personality Scale: BFI = Big Five Inventory, IPIP = 10-item Sample Questionnaire from the International Personality Item Pool, Goldberg = Big Five personality measurement items adopted and adapted from Goldberg (1990), NEO-PI = NEO Personality Inventory, NEO-PI-R = Revised NEO Personality Inventory (Costa & McCrae, 1992, 2008), IP/5F (Salgado, 1996, 1998a), FFM = self-constructed Big 5 measure, BFI-SV = Big Five Inventory Short Version, BFI10 = Short version of the Big Five Inventory, TIPI = Ten Item Personality Inventory, NEO-FFI = Short version of the NEO-PI; Dark Scale: LSRP = Levenson's Self-Report Psychopathy scale, MACH-IV = 20-item Mach-IV (Christie & Geis, 1970), MPS = Machiavellianism Personality Scale, MS = Machiavellianism scale, NPI = Narcissistic Personality Inventory (Raskin & Hall, 1979), PPI = Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996), SRP-III = Self-Report Psychopathy Scale (Paulhus et al., in press), TRIPM = Triarchic measure of psychopathy adapted to Polish conditions, PPI-SF = Psychopathic Personality Inventory Short Form (Lilienfeld & Widows, 2005), SD3 = Short Dark Triad (Jones & Paulhus, 2014); O = Openness; C = Conscientiousness; E = Extraversion; A = Agreeableness; H = Honesty-Humility; N = Neuroticism; MACH = Machiavellianism; NARC = narcissism; PSYCH = psychopathy; Study quality: 4 = highest, 0 = lowest possible score

Table 2

Results from meta-analyses of the relationship between personality traits and academic dishonesty.

Trait	k	N	r	95% CI		Q(df = k-2)	p	I ²
				Lower	Upper			
O	43	17343	-.073	-.127	-.018	7.103	.011	85.890
C	60	21885	-.181	-.269	-.090	15.649	.000	91.830
E	48	18790	.030	-.016	.075	1.751	.192	71.830
A	44	17642	-.138	-.218	-.057	11.737	.001	91.110
N	52	19490	.053	-.012	.118	2.641	.110	78.920
H	5	1225	-.291	-.571	.050	5.654	.076	87.770
MACH	16	4527	.175	.046	.298	8.359	.011	85.300
NARC	16	4342	.121	.045	.195	11.515	.004	57.450
PSYCHO	23	15487	.269	.169	.364	29.494	.000	90.200
CORE	60	25581	.233	.182	.283	79.594	.000	77.700

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism, H = Honesty-Humility, MACH = Machiavellianism, NARC = narcissism, PSYCH = psychopathy, CORE = Dark Core (reverse coded honesty-humility, Machiavellianism, narcissism, and psychopathy combined); k = number of included effect sizes; N = sample size; r = weighted average correlation (multilevel model); 95% CI: Lower = lower bound of confidence interval; Upper = upper bound of confidence interval; *r*_{p-uniform*} = weighted average correlation (*p*-uniform* estimation); *Q* = Cochran’s *Q* test of effect size heterogeneity; *df* = degrees of freedom; *p* = *p*-value of *Q* test; *I*² = percentage of variation across studies that is due to heterogeneity

Table 3

Results from tests for publication bias.

Trait	k	p-uniform*		Eggers Regression	
		L	pp-uniform*	z	pEgger
O	25	0.082	.960	-1.278	.201
C	36	1.427	.490	-3.100	.002
E	28	0.036	.982	-0.840	.401
A	25	0.706	.703	-1.591	.112
N	31	0.054	.973	2.112	.035
H	3	0.019	.990	-1.435	.151
MACH	9	0.634	.728	0.826	.409
NARC	10	2.674	.263	-0.789	.430
PSYCHO	10	1.102	.577	0.004	.997
CORE	18	0.069	.966	0.151	.880

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism, H = Honesty-Humility, MACH = Machiavellianism, NARC = narcissism, PSYCH = psychopathy, CORE = Dark Core (reverse coded honesty-humility, Machiavellianism, narcissism, and psychopathy combined); p-uniform* = publication bias test p-uniform*; Eggers Regression = regression test for funnel plot asymmetry with mixed-effects meta-regression model and standard error as predictor; k = number of effect sizes; L = test statistic of p-uniform*'s publication bias test; pp-uniform* = p-value for p-uniform publication bias test; z = z-value; pEgger = p-value for Eggers Regression test.

Figures **Figure 1.** Prisma flow chart of study inclusion and exclusion.