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How to cite this publication

Please cite the final published version:

Vedel, A., & Thomsen, D. K. (2017). The Dark Triad across academic majors. *Personality and Individual Differences*, 116, 86-91. doi:[10.1016/j.paid.2017.04.030](https://doi.org/10.1016/j.paid.2017.04.030)

Publication metadata

Title: The Dark Triad across academic majors
Author(s): Vedel, Anna & Thomsen, Dorthe K.
Journal: Personality and Individual Differences
DOI/Link: <https://doi.org/10.1016/j.paid.2017.04.030>

Document version: Accepted manuscript (post-print)

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Abstract

The Dark Triad traits (i.e., narcissism, psychopathy, and Machiavellianism) have been associated with the desire for power, status, and social dominance in the workplace, and these desires have been hypothesized to draw Dark Triad individuals towards occupations affording such outcomes. Following this reasoning, the Dark Triad may also influence educational choices. Research in other personality traits has shown that Big Five traits impact educational choices: Students in different academic majors differ on Big Five traits at enrollment. The aim of the present study was to explore whether there are also pre-existing Dark Triad differences across academic majors. Accordingly, the Big Five and the Dark Triad traits were measured in a sample of newly enrolled students ($N = 487$) in different academic majors (psychology, economics/business, law, and political science), and mean scores were compared. Group differences in the Big Five personality traits largely replicated previous findings. Group differences in the Dark Triad traits were also found and included medium and large effect sizes with the largest differences being between economics/business students (having high Dark Triad scores) and psychology students (having low Dark Triad scores). These findings indicate that Dark Triad as well as Big Five traits may influence educational choices.

Keywords: personality; Dark Triad; Big Five; academic majors; group differences

1. Introduction

Most of us probably hold some preconceptions about people in other occupations. And if we don't, there is no shortage of stereotypical characters in the entertainment industry to draw inspiration from. Lawyers and businessmen, for example, are in movies and series often portrayed as manipulating and cynical individuals who use other people for their own gain and are ready to do whatever it takes to get ahead (Asimow, 2000; Ribstein, 2012). These characters are often unlikeable, yet strangely fascinating, and they can, admittedly, be quite entertaining to watch. But the stereotypical characters aside, are there actually more of these "dark" personalities within the fields of law and business than among people in other academic fields, and do they become "dark" during their academic schooling, or do they choose their academic field based on pre-existing dark personality characteristics? Scholars within the social sciences have argued that the academic schooling within law and business schools promotes a view of human nature and a behavioral pattern that heavily emphasize self-interest (for an overview, see Elegido, 2009). If this is true, then a higher prevalence of "dark" personalities within the fields of law and business could be a function of socialization processes, and then law and business schools influence not only the professional development of their students, but also their personality development. However, it may also be the case that dark personalities are prevalent within law and business simply because individuals with dark personality characteristics are attracted to law and business majors in the first place. If this is true, then one would expect to find more dark individuals within these academic fields already at enrolment. The present study tested this self-selection hypothesis and drew inspiration from previous personality and organizational research.

1.1. The Big Five and academic majors

A recent review of research on Big Five personality traits across academic majors concluded that law, business, and economics students score consistently lower on the personality trait agreeableness than students enrolled in other majors, particularly when they are compared with for example psychology, humanities, or arts students (Vedel, 2016). Individuals who score low on agreeableness are competitive, skeptical, and tough-minded (Costa & McCrae, 1992), and as such, law, business, and economics students have perhaps the closest thing to a “dark” personality within the Big Five taxonomy compared with other students.

1.2. The Dark Triad in the workplace

However, it has been argued that the Big Five do not adequately capture dark and socially undesirable characteristics such as the tendency to be manipulative and exploitive of others (e.g. Lee & Ashton, 2014). Accordingly, socially aversive characteristics have been studied by means of other trait constructs (Kowalski, 2001), and three such traits are psychopathy, Machiavellianism, and narcissism. Paulhus and Williams (2002) coined the term *Dark Triad* to highlight the shared features of these three traits and encourage researchers to study them in tandem. Since then, research on the Dark Triad has expanded rapidly (see Furnham, Richards, & Paulhus, 2013, for an overview), and even more so with the advent of the brief composite measures: the Dirty Dozen (DD; Jonason & Webster, 2010) and the Short Dark Triad (SD3; Jones & Paulhus, 2014). The Dark Triad has been studied in relation to workplace behaviors, where individuals scoring high on Dark Triad traits have been found to use more manipulation at work (Jonason, Slomski, & Partyka, 2012), display counterproductive work behavior (O'Boyle, Forsyth, Banks, & McDaniel, 2012), and exhibit high desire for power (Lee et al., 2013). The desire for power, status, and social dominance characterizing Dark Triad individuals has been hypothesized to draw these individuals

towards occupations affording opportunities to achieve these outcomes and steer them away from other occupations (Jonason, Wee, Li, & Jackson, 2014), and research on vocational interests generally supports this view (Jonason et al., 2014; Kowalski, Vernon, & Schermer, 2017).

1.3. The Dark Triad and academic majors

It seems plausible that Dark Triad individuals would choose academic majors with perceived potential to gain power and status, such as business or law. Given the relative novelty of the conception of the Dark Triad, research in Dark Triad group differences across academic majors is very limited, though. Wilson and McCarthy (2011) explored subclinical psychopathy in university students and found that commerce and law students scored significantly higher on this trait than arts and science students. But neither narcissism nor Machiavellianism was measured, and the students were enrolled in various semesters, which means that socialization effects within faculties cannot be ruled out as explanation for the differences. Krick et al. (2016), on the other hand, included all Dark Triad traits and found higher scores on the Dark Triad for business and management students than for other students. Also, students between first and sixth semester were categorized as “beginners”, while the remaining were categorized as “advanced”, and the two groups were compared in an effort to rule out socialization effects. However, socialization effects could take place early on in the education, and merging the first six semesters into one category may mask such effects. Furthermore, only Dark Triad composite scores were analyzed in this study, and the business and management students were compared with an undifferentiated “others” group.

1.4. The present study

The main purpose of the present study was to extend existing knowledge on the Dark Triad across academic majors by overcoming some of the methodological limitations of

previous studies. Specifically, all the Dark Triad traits were measured, they were analyzed separately, specific academic majors were compared (law, economics/business, psychology, and political science), the students were all newly enrolled, and effect sizes were calculated in order to estimate the magnitude of the personality differences. A secondary aim was to replicate the Big Five personality group differences across academic majors found in previous studies (Vedel, 2016). Also, gender effects have been found on both the Dark Triad and the Big Five personality traits: females generally score lower than males on all Dark Triad traits (Furnham et al., 2013) and higher on agreeableness, conscientiousness, and neuroticism (Vedel, 2016), and gender effects were therefore examined.

Previous research on the Dark Triad and on the Big Five personality traits across academic majors guided the hypotheses. Wilson and McCarthy (2011) found that commerce and law students score higher on psychopathy than arts and science students, and Krick et al. (2016) found that business and management students score higher on the Dark Triad composite compared with other students. Adding to this the negative relationship between all Dark Triad traits and agreeableness (Vize, Lynam, Collison, & Miller, 2016) and the low levels of agreeableness characterizing law and economics/business students (Vedel, 2016), economics/business and law students were expected to score higher than psychology and political science students on all Dark Triad traits (H1). Based on the Big Five personality group differences across academic majors reported in Vedel (2016), three hypotheses about Big Five personality group differences were formulated: Psychology students will score higher on neuroticism and agreeableness than all other students and higher on openness than economics/business and law students (H2). Political science students will score higher on openness and agreeableness than economics/business and law students and higher on extraversion than psychology students (H3). Economics/business and law students will score higher than psychology students on extraversion (H4).

2. Method

2.1. Participants

Participants were 487 newly enrolled students at a Danish university in September 2016. The age of the students ranged from 17 to 45 years (mean age = 21.12, $SD = 2.39$), and the students fell into one of four academic fields: psychology ($n = 103$; 87% female), economics/business ($n = 158$; 43% female), law ($n = 93$; 80% female), and political science ($n = 133$; 59 % female).

2.2. Procedure

The study was approved by the Danish Data Protection Agency, and the participants were recruited in cooperation with the University Registrar's Office. A welcome email was sent to all newly admitted students in business and social sciences programs inviting them to participate in a study by use of a link to an electronic questionnaire. Students who consented to the study and completed the questionnaire participated in a prize draw for 10 gift vouchers worth US\$145 to shops, cafés, etc. of their choice. Also, a standard personality profile was provided upon request. The present study was part of a larger research project, and the questionnaire measured other constructs than personality traits, such as subjective well-being and academic self-efficacy. Only measures used in the present study will be described here.

2.3. Measures

2.3.1. The NEO Five-Factor Inventory

The Big Five personality traits were measured with the Danish adaptation of the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992; Danish version: Hansen, Mortensen, & Schiøtz, 2004). This 60-item questionnaire measures the Big Five personality traits and their respective six facets with 12 items per factor and two items per facet. General personality-relevant statements are self-rated on a 5-point Likert scale ranging from 0

(*strongly disagree*) to 4 (*strongly agree*). The Danish NEO-FFI is a validated instrument with high internal consistency corresponding to the American NEO-FFI (Hansen, Mortensen, & Schiøtz, 2004). In the current study, Cronbach's α for the NEO-FFI scales ranged from .76 for openness to .85 for conscientiousness (see Table 1).

2.3.2. *The Short Dark Triad*

The Dark Triad personality traits were measured with the Short Dark Triad (SD3; Jones & Paulhus, 2014). The SD3 is a 27-item questionnaire measuring Machiavellianism, narcissism, and psychopathy with 9 items per trait. The items are personality-relevant statements, which are self-rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). For the present study, the SD3 was translated into Danish independently by an English expert and a psychological researcher not involved in the project. Back-translations were performed independently by another English expert and another psychological researcher not involved in the project. Only minor differences between the back-translations and the original SD3 emerged. The small divergences were discussed by all translators and the authors, and a final Danish version of the SD3 was formulated. Cronbach's α for the SD3 scales were satisfactory with values resembling the average reliability coefficients reported in the meta-analysis by Vize et al. (2016) ranging from .66 for narcissism to .80 for Machiavellianism (see Table 1).

3. Results

3.1. *Descriptives, reliability coefficients, and correlations*

Means and standard deviations by gender, Cronbach's α , and correlations for the Dark Triad and the Big Five personality traits are presented in Table 1. The correlational results closely resembled the meta-analytic results reported in Vize et al. (2016): Narcissism was moderately positively correlated with Machiavellianism and psychopathy, and

Machiavellianism and psychopathy were strongly positively correlated. All Dark Triad traits were negatively correlated with agreeableness, though particularly Machiavellianism and psychopathy, and narcissism correlated positively with extraversion and openness, while Machiavellianism correlated negatively with extraversion. Also, psychopathy in particular correlated negatively with conscientiousness. Only the moderate negative correlation found between narcissism and neuroticism differed from the results by Vize et al. (2016), who found no clear association between these traits.

Table 1.

Means and standard deviations by gender, Cronbach's α , and correlations for the Dark Triad and the Big Five personality traits

	Mean (SD)			α	1.	2.	3.	4.	5.	6.	7.
	Males	Females	Total								
1. Neuroticism	19.99 (7.47)	24.65 (7.63)	22.97 (7.89)	.84							
2. Extraversion	32.03 (6.53)	31.05 (7.21)	31.40 (6.98)	.82	-.43**						
3. Openness	26.56 (7.30)	27.89 (6.82)	27.41 (7.02)	.76	.22**	.15**					
4. Agreeableness	28.84 (7.03)	32.50 (6.58)	31.18 (6.96)	.81	-.03	.04	.16**				
5. Conscientiousness	30.38 (7.20)	32.91 (6.67)	32.00 (6.97)	.85	-.29**	.19**	-.14**	.06			
6. Machiavellianism	2.99 (0.62)	2.64 (0.62)	2.77 (0.64)	.80	.05	-.09*	-.17**	-.66**	-.03		
7. Narcissism	3.00 (0.51)	2.76 (0.50)	2.84 (0.52)	.66	-.30**	.47**	.14**	-.38**	.12**	.30**	
8. Psychopathy	2.33 (0.51)	1.91 (0.50)	2.06 (0.54)	.68	.04	.05	-.01	-.61**	-.27**	.56**	.39**

* $p < .05$.

** $p < .01$.

3.2. Main effects of gender and academic major on personality scores

Two (gender) by four (academic major) analyses of variance with the Dark Triad and the Big Five personality traits as dependent variables were performed (see Table 2).

Significant gender effects replicating results from previous research (Furnham et al., 2013;

Vedel, 2016) were found: Male students scored significantly higher on all Dark Triad traits

than female students, female students scored significantly higher on neuroticism,

agreeableness, and conscientiousness than male students, and non-significant results were

found for extraversion and openness. There was a significant effect of academic major for all

personality traits except from extraversion and psychopathy. No significant interactions

between gender and academic major were present.

Table 2

Two (gender) by four (academic major) analyses of variance with the Dark Triad and the Big Five personality traits as the dependent variables

	Gender		Major		Gender x Major	
	<i>F</i> (df)	η^2	<i>F</i> (df)	η^2	<i>F</i> (df)	η^2
Neuroticism	10.77 (1, 479)**	.02	6.33 (3, 479)**	.04	1.88 (3, 479)	.01
Extraversion	0.64 (1, 479)	.00	0.52 (3, 479)	.00	0.79 (3, 479)	.01
Openness	0.01 (1, 479)	.00	16.26 (3, 479)**	.09	0.81 (3, 479)	.01
Agreeableness	12.99 (1, 479)**	.03	9.36 (3, 479)**	.06	0.49 (3, 479)	.00
Conscientiousness	13.63 (1, 479)**	.03	5.76 (3, 479)**	.04	0.48 (3, 479)	.00
Machiavellianism	15.92 (1, 479)**	.03	6.56 (3, 479)**	.04	1.37 (3, 479)	.01
Narcissism	11.82 (1, 479)**	.02	3.38 (3, 479)*	.02	0.64 (3, 479)	.00
Psychopathy	38.96 (1, 479)**	.08	2.26 (3, 479)	.01	1.01 (3, 479)	.01

* $p < .01$.

** $p < .001$.

3.3. Post-hoc comparisons of academic majors

Table 3 presents post-hoc comparisons of means by academic major for the Dark Triad and the Big Five personality traits using the Bonferroni correction. Post-hoc comparisons were not performed for extraversion and psychopathy since no significant main effects were found for these traits, but means and standard deviations are reported. Since Levene's test of homogeneity of variance was statistically significant ($p < .05$) for agreeableness and Machiavellianism, bootstrapped confidence intervals for the post-hoc tests were selected in these instances. Economics/business students scored significantly higher on Machiavellianism than all others and significantly higher on narcissism than both psychology and political science students, supporting H1. Law students scored significantly higher on Machiavellianism than psychology students, also consistent with H1. They did not score higher than political science students on Machiavellianism, though, or significantly higher than any other groups on narcissism. Psychology students scored significantly higher on neuroticism than economics/business and political science students, supporting H2, but not significantly higher than law students. They also scored higher than economics/business and law students on both agreeableness and openness, supporting H2, but not significantly higher on agreeableness than political science students. Political science students scored

significantly higher on openness and agreeableness than economics/business and law students, supporting H3. Since no main effect of academic major was found for extraversion, H4 was not supported. Findings not hypothesized were that political science students scored significantly lower on conscientiousness than all other students and that both political science and law students scored significantly higher on neuroticism than economics/business students.

Table 3.

Means, standard deviations, and post-hoc results for the Dark Triad and the Big Five personality traits by academic major

	N	E	O	A*	C	Mach.*	Narc.	Psych.
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Psychology	25.82 ^{a,b} (7.94)	30.29 (6.56)	30.52 ^{a,c} (6.20)	34.50 ^{a,c} (5.34)	32.55 ^b (7.32)	2.47 (0.51)	2.73 (0.46)	1.81 (0.42)
Econ./Bus.	20.23 (7.04)	32.06 (6.99)	24.91 (6.42)	28.92 (7.56)	32.70 ^b (6.73)	3.00 ^{b,c,d} (0.63)	2.98 ^{b,d} (0.50)	2.22 (0.61)
Law	24.20 ^a (7.40)	31.26 (7.68)	25.95 (6.75)	29.68 (7.12)	33.10 ^b (6.47)	2.75 ^d (0.73)	2.84 (0.49)	2.05 (0.59)
Pol. Sc.	23.14 ^a (8.18)	31.59 (6.76)	28.98 ^{a,c} (7.18)	32.35 ^{a,c} (5.97)	29.97 (6.96)	2.75 ^d (0.58)	2.77 (0.56)	2.09 (0.43)

^a The mean is higher than the mean for Economics/Business at $p < .05$.

^b The mean is higher than the mean for Political Sc. at $p < .05$.

^c The mean is higher than the mean for Law at $p < .05$.

^d The mean is higher than the mean for Psychology at $p < .05$.

* Bootstrapping was performed.

3.4. Effect sizes of differences in personality scores among academic majors

Effect sizes are standardized and are therefore useful supplements to significance tests, which are highly influenced by sample size (Cohen, 1988; 1990). Cohen's d was therefore calculated for all traits to estimate the magnitude of the personality differences among students in different majors. These effect sizes are presented in Table 4. Following Cohen's guidelines for interpretation of effect sizes (Cohen, 1988), medium effect sizes were found for most personality traits, and even large ones for openness, agreeableness, and Machiavellianism. Notably, medium and medium-large effect sizes were found for psychopathy despite the non-significant main effect of academic major for this trait.

Specifically, psychology students scored much lower on psychopathy than all other students, and economics/business students scored highest on this trait.

To gauge the role of gender in Dark Triad group differences across academic majors, effect sizes were also calculated separately for male and female students. These are presented in Table 5. For both males and females, medium and medium-large effect sizes for Dark Triad traits were found, and while some comparisons of majors yielded larger effects sizes among male students than among female students, the opposite was the case for other comparisons.

Table 4.
Effect sizes of personality mean differences

	Cohen's <i>d</i>							
	N	E	O	A	C	Mach.	Narc.	Psych.
Psychology – Economics/Business	0.75	-0.26	0.89	0.82	-0.02	-0.89	-0.52	-0.75
Psychology – Law	0.21	-0.14	0.71	0.77	-0.08	-0.44	-0.22	-0.48
Psychology – Political Sc.	0.33	-0.20	0.23	0.38	0.36	-0.49	-0.08	-0.65
Economics/Business – Law	-0.55	0.11	-0.16	-0.10	-0.06	0.37	0.30	0.28
Economics/Business – Political Sc.	-0.39	0.07	-0.60	-0.50	0.40	0.42	0.40	0.25
Law – Political Sc.	0.14	-0.05	-0.43	-0.41	0.46	0.01	0.12	-0.07

Note. Negative numbers indicate that the last-mentioned group in the comparison scored higher on the trait. Numbers in bold indicate medium effect sizes. Numbers in bold and italics indicate large effect sizes. N = Neuroticism. E = Extraversion. O = Openness. A = Agreeableness. C = Conscientiousness. Mach. = Machiavellianism. Narc. = Narcissism. Psych. = Psychopathy.

Table 5.
Dark Triad effect sizes by gender

	Cohen's <i>d</i>					
	Males			Females		
	Mach.	Narc.	Psych.	Mach.	Narc.	Psych.
Psychology – Economics/Business	-0.70	-0.44	-0.40	-0.69	-0.25	-0.44
Psychology – Law	-0.67	-0.18	-0.18	-0.35	-0.20	-0.49
Psychology – Political Sc.	-0.15	0.10	-0.14	-0.50	-0.03	-0.55
Economics/Business – Law	0.01	0.24	0.24	0.26	0.05	-0.06
Economics/Business – Political Sc.	0.54	0.52	0.33	0.21	0.18	-0.03
Law – Political Sc.	0.52	0.27	0.07	-0.07	0.14	0.03

Note. Negative numbers indicate that the last-mentioned group in the comparison scored higher on the trait. Numbers in bold indicate medium effect sizes. Numbers in bold and italics indicate large effect sizes. Mach. = Machiavellianism. Narc. = Narcissism. Psych. = Psychopathy.

4. Discussion

4.1. Magnitude of the personality group differences among academic majors

As expected, economics/business students scored higher on all Dark Triad traits than psychology and political science students in the present study. However, the effect sizes (see Table 4) show that the differences were particularly large when economics/business students were compared with psychology students. The effect sizes also show that law students scored substantially higher on all Dark Triad traits than psychology students, but that the differences between law students and political science students were negligible. Consequently, the economics/business students were the “darkest” group, the psychology students were the “brightest” group, and the law and political science students were more similar than expected and fell somewhere in the middle. With regard to the Big Five traits, the results from the present study replicated the findings from Vedel (2016). Psychology students scored much higher on agreeableness and openness than all others, especially when they were compared with economics/business and law students. They also scored higher on neuroticism than all others, particularly compared with economics/business students. Political science students scored substantially higher on openness and agreeableness than economics/business and law students, and these three groups all scored higher on extraversion than psychology students, as expected, though these effect sizes were smaller.

4.2. Gender effects

The Dark Triad gender differences in the present study (and in previous research) and the different gender distributions across academic majors may cause one to suspect that the Dark Triad differences across majors are simply gender effects reflecting the generally higher Dark Triad scores of males. The economics/business group had the highest percentage of males (57%), whereas the psychology group had the lowest (13%), and this may partly explain why the largest effect sizes of the Dark Triad differences were found in comparisons

of these two groups (see Table 4). However, the law students had a gender distribution very similar to the psychology group with a low percentage of males (20%), and this group still scored much higher on the Dark Triad (and much lower on agreeableness) than the psychology group. Furthermore, the effect sizes of the Dark Triad differences across majors calculated separately for males and females showed that there were also Dark Triad differences across majors when the data were not collapsed across genders. Medium and medium-large effect sizes were for example found for Machiavellianism in comparisons between female psychology and economics/business students and between female psychology and political science students; the psychology females scored substantially lower than the others. The economics/business females, on the other hand, scored higher than all other females on Machiavellianism, and they even scored higher than the males from psychology and political science on this trait (separate means for males and females are not reported here due to space constraints; contact first author for details). Consequently, the different gender distributions of the academic majors contribute to the differences in the Dark Triad traits across majors, but the differences are not mere gender effects.

4.3. Socialization within academic disciplines or self-selection based on personality?

Organizational research suggests that there are more individuals with manipulative, ruthless, and self-serving behavior in the corporate world than elsewhere (Babiak & Hare, 2006), as evidenced by the accumulating research on *corporate psychopaths* (Boddy, 2015). It has long been argued (Elegido, 2009) that this is partly due to the specific model of the human being that economics, business, and law students are consistently exposed to during their studies: the traditional homo economicus model which emphasizes rationality and self-interest. Socialization effects may or may not come into play over time, but since the students in the present study were all newly enrolled, it is unlikely that the personality differences found derive from socialization processes. Instead, the personality differences may reflect

different motives and desires of students enrolling in different majors. The desire for power, status, and money characterizing Dark Triad individuals (Lee et al., 2013) may steer them towards for example economics, business, and law educations because these educations pave the way for a career in the corporate world, and the corporate world generally rewards self-serving behavior and provides an environment in which individuals with dark personalities can make use of their qualities and succeed (Babiak & Hare, 2006). Leadership research, for example, shows that the authoritative component of narcissism is related to leader emergence, while the sense of entitlement and high self-esteem is related to executive performance, and the bold actions and decisions of narcissistic CEOs draw attention to their vision and leadership (Judge, Piccolo, & Kosalka, 2009). Analogously, Machiavellianism is associated with the motivation to lead and being willing to invest heavily to achieve goals, but also with strategic thinking and being able to navigate power dynamics in complex business organizations (Judge et al., 2009). As such, the propensity of Dark Triad individuals to choose business, law, or similar majors may reflect both a desire for power and status and the assumption that these educations could lead to a successful career. The results from the present study therefore support the idea that self-selection based on personality traits – dark and bright – plays a part in educational choices.

4.4. Limitations and future directions

There are some limitations in the present study. First of all, the sample included only four academic majors. It would be interesting to see how other academic groups score on the Dark Triad, and future studies will hopefully explore this. Secondly, the present study employed personality data from a single time point and therefore could not detect potential socialization effects taking place over time. Future longitudinal studies are encouraged to examine such personality changes. Also, future studies are encouraged to test whether Dark

Triad scores are associated with academic success in majors that have high proportions of Dark Triad individuals, such as business and law majors.

5. Conclusion

The present study found substantial personality group differences in both the Dark Triad and the Big Five traits across academic majors. There were more “dark” individuals within the field of economics/business than anywhere else, and the law and political science students were also “darker” than the psychology students. Furthermore, these personality group differences were present already at enrollment and therefore not due to socialization processes. The choice of academic major and career is a complex decision involving many different factors, but the present study suggest that personality traits are at least part of this decision process.

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