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Short Communication

Cause we are living in a Machiavellian world, and I am a Machiavellian major: Machiavellianism and academic major choice

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ABSTRACT

Students from diverse academic majors differ in their personalities. However, the study of the association between Machiavellianism (i.e., desire for power, status, and social dominance) and educational choices (i.e., academic major choices) that lay a path toward occupations that allow for those outcomes has been largely ignored. Using a large multinational sample of 35,025 participants across 50 majors, we found overall support for a significant association between Machiavellianism and academic major choice. We break down the results by sex and provide a cross-country comparison.

1. Introduction

Students across diverse academic majors differ in personality (Harris, 1993; Vedel, 2016), suggesting that personality traits can influence educational choices (Vedel & Thomsen, 2017). This is because students select their college major based on their desire to initiate a specific career. In this paper, we argue that the personality differences that predict academic majors extend to the Dark Triad trait of Machiavellianism as well. We hypothesize that Machiavellians, namely individuals who hold a desire for power, status, and social dominance, gravitate toward occupations that allow for these outcomes. In addition, we argue that Machiavellians tend to favor “thing-oriented” academic majors over “person-oriented” majors because such majors are traditionally associated with successful and sought-after careers. Finally, we provide a descriptive overview by sex and country of Machiavellianism in various academic majors using a large multinational sample.

2. Personality and college majors

The choice of a college major is a potentially life-framing decision, requiring the individual to consider a rich set of information on a fixed timetable, and is made independently by many young people every year (Galotti et al., 2006). These factors make college major decisions a fertile research target for understanding the interplay between personality and decision-making. Prior research has extensively examined the

relationship between the Big Five personality traits and college major choices across law, business, economics, psychology, humanities, and art (Vedel, 2016), and has suggested a relationship between student personality and major choice among the arts, sciences, and social sciences (Harris, 1993). More recently, researchers have extended this examination to the study of Dark Triad traits (Vedel & Thomsen, 2017).

Individuals who score high on the Dark Triad traits seem to choose college majors with high potential to acquire power and status. For example, prior research found a positive relationship between Dark Triad traits and the choice of business/economics as the respective field of study (Vedel & Thomsen, 2017). However, no previous study has specifically examined Machiavellianism using a large sample spanning several countries.

Machiavellians demonstrate a talent for influencing others to achieve their desired aims, including the use of deception, manipulation, force, or coercion (McCleskey, 2013). Machiavellianism is more common among men than among women (Monaghan et al., 2018). Concerning college major choice, Vedel and Thomsen (2017) found that business and economics majors scored higher than political science/law majors ($p < 0.05$) on Machiavellianism, while both majors scored higher on Machiavellianism than psychology majors ($p < 0.05$). However, the aforementioned study was limited in both sample size and the number of examined academic majors, and single-country participant recruitment. In the present study, we examined this research thread in a substantially larger sample across multiple majors and countries, and report relevant

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sex differences across majors.

3. Methods

The sample of this study was based on a dataset (<https://openpsychometrics.org>) comprising 73,489 observations across 177 countries. The data were collected between July 2017 and March 2019. In total, 47,219 participants listed their Machiavellianism scores and college majors. The dataset also included a series of attention-check questions, which 35,368 participants answered correctly. As we were also interested in assessing sex differences, we dropped observations that either did not list sex or specified sex as “other” without additional information. This led to a final sample size of 35,025 participants (45.74 % female) and 32,287 observations (participants could provide multiple majors). To facilitate our analysis, college majors were divided into 50 distinct categories. Table 1 presents an overview of the most frequent college majors.

Table 1
Overview of college majors categories.

	n	Male	Female	Example majors
Architecture	293	164	129	Architecture, Architectural studies
Arts	2095	828	1267	Design, Fashion, Theatre, Visual Arts
Behavioral Science	3162	1129	2033	Behavioral Science, Cognitive Science, Psychology,
Biology	1351	637	714	Biology, Biotech, Genetics
Business	5197	2839	2358	Business, Finance, Marketing
Chemistry	581	377	204	Chemistry, Chemical Engineering
Communications	580	226	354	Broadcasting, Communication, Media
Computer Science	1885	1523	362	Computer science, Data analytics, Programming,
Economics	1185	797	388	Economics, Econometrics, Economic policy
Education	782	190	592	Education, General Education, Pedagogy
Engineering	3805	3123	682	Civil Eng*, Mechanical Eng*, Production Eng*
Geography	237	142	95	Geography, Geology, Meteorology, Oceanography
Health	318	95	223	Epidemiology, Health, Health Sciences
History and Culture	1022	614	408	Classics, History, Humanities
Information Technology	688	579	109	Information Science, IT
Languages	1992	675	1317	Ancient Greek, English, Literature
Law	1246	675	571	Criminal Justice, Law, Pre-Law
Math	664	443	221	Math, Mathematics, Statistics
Medical	234	74	160	Radiology, Speech Pathology, Medical Assistance
Medicine	844	452	392	Kinesiology, Medicine, Surgery
Music	326	172	154	Music, Music Performance, Musicology
Nursing	606	98	508	Nursing, Pre-Nursing
Philosophy	353	235	118	Philosophy, Philosophy of Religion
Physics	510	385	125	Physics, Theoretical Physics
Politics	1042	631	411	Governance, Political Science, Public Administration
Science	385	189	196	General Sciences, Natural Sciences, Science
Social Work	318	58	260	Counselling, Social Work, Therapy
Social Studies	206	77	129	Social Science, Gender Studies, Welfare
Sociology	380	143	237	Sociology

3.2. Measures

3.2.1. Machiavellianism

Machiavellianism ($\alpha = 0.88$; $M = 3.31$, $SD = 0.77$) was assessed using the online version of the 20-item MACH-IV scale (1 = disagree, 5 = agree), developed by Christie and Geis (1970). Items were presented at random. Items included statements such as “The best way to handle people is to tell them what they want to hear”, “It is hard to get ahead without cutting corners here and there”, and “Most people who get ahead in the world lead clean, moral lives” (reverse scored).

3.2.2. Demographics

The age range of participants was wide, and many participants had completed not only college degrees but also post-graduate degrees and professional degrees (e.g., MBA/JD). As setting one’s sight on a future professional degree might also influence undergraduate choices, we controlled for both age¹ and educational attainment. Finally, we also took into account sex as an additional demographic variable.

4. Results

Machiavellian group-mean (i.e., between college majors) reliability was high ($=0.96$) and a one-way ANOVA concluded significant Machiavellian score differences between college majors ($F = 24.09$, $p < 0.001$). To gain a good overview of the distribution of standardized Machiavellianism scores across college majors, we graphed results accordingly (Fig. 1).

As shown in Fig. 1, we found substantial differences in Machiavellianism scores across several college majors. For example, participants who majored in Education reported much lower Machiavellianism scores than participants who majored in Economics. Interestingly, we found differences in Machiavellianism scores, even in closely related majors (e.g., Medical = -0.28 , Medicine = 0.09).

Next, we examined whether these differences across majors were likely due to sex. A mean comparison test ($t = 50.89$, $p < 0.001$) indicated that male participants ($M = 0.24$) had higher Machiavellianism scores than female participants ($M = -0.29$) across majors. To better understand these results and the large differences, we graphed Machiavellianism scores across majors and sex. The results are shown in Fig. 2.

The results indicate that sex seems to be an important variable to consider when examining the distribution of Machiavellianism across college majors. For example, (mean-comparison) sex differences were most apparent in “person-oriented” majors (e.g., Education, female: $t = -0.63$, male: $t = 0.02$; Nursing, female: $t = -0.59$, male: $t = 0.06$) and “thing-oriented” majors (e.g., Law, female: $t = 0.49$, male: $t = 0.01$; Politics, female: $t = -0.05$, male: $t = 0.49$). However, in no single major did male participants score lower than female participants on Machiavellianism.

As the available data were cross-cultural, and because country-level Machiavellianism score difference were found in prior studies (Jonason et al., 2020), it is critical to explore whether country-level Machiavellianism scores also play a role in academic major selection. We therefore examined whether the distribution of Machiavellian scores across academic majors was universal or country-specific. A country-specific overview of absolute Machiavellian scores (by sex) is provided in the Supplementary Materials document (Table SM-1).

We limited graphing results per major and sex to the top six countries (minimum 1000 observations), including Australia (AU), Canada (CA), Great Britain (GB), India (IN), the United States of America (US), and finally Hungary (HU). An overview of (standardized) Machiavellian scores by sex in these countries is shown in Fig. 3.

¹ Seven participants did not indicate or indicated an impossible value for age (e.g., 999999). These observations were dropped for the purposes of the main regression analysis.

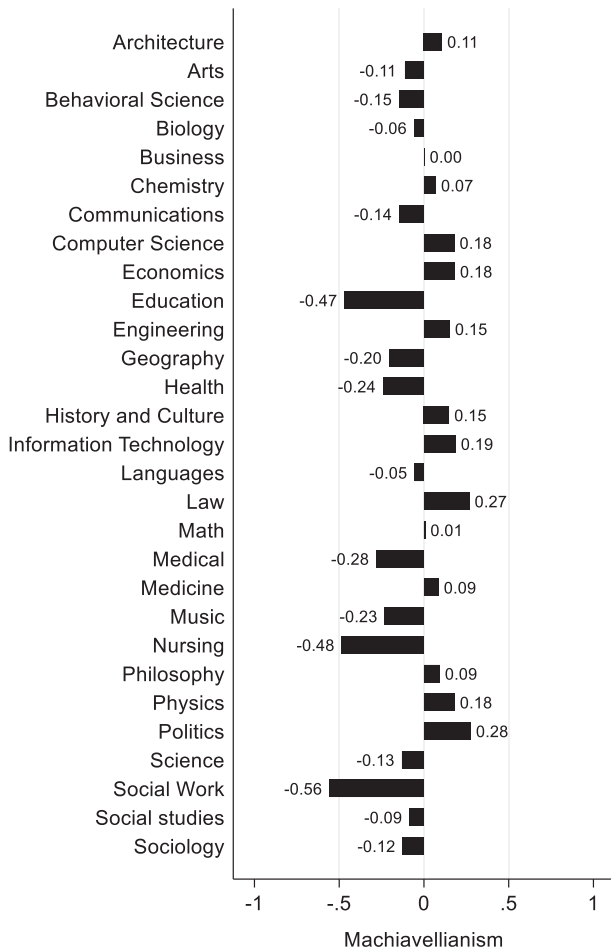


Fig. 1. Machiavellianism scores by college major.

To test country-specific differences for each major, while controlling for other factors, including demographics (i.e., age, sex, and educational attainment), we ran a multinomial logistic regression with robust standard errors. As predictors of college major selection, we specified a two-way interaction between Machiavellianism and country. The U.S. was designated as the baseline country due to the largest number of observations. Results are depicted in Fig. 4. More detailed information is available in the Supplementary Materials document (Table SM-2).

We found only limited differences across countries and college majors. Among English-speaking countries, we only found differences between Australia and the U.S. with regard to college majors in Medicine ($b = 0.48, SE = 0.21, t = 2.31, p = 0.021$). All other interaction coefficients, except for Economics (see below), among native English-speaking countries, were not significant.

The college major with the most country difference was Economics. Here, we found differences for each country when compared to the U.S. In all cases, the interaction coefficients were negative, indicating that participants with an Economics major in all other considered countries reported significantly lower Machiavellianism scores than U.S. participants with the same major.

5. Discussion

While Vedel and Thomsen (2017) laid the groundwork by examining the link between Machiavellianism and four academic majors in participants in Denmark, the present study is the first to do so cross-culturally and across 50 academic majors. We expected individuals who scored high on Machiavellianism to choose college majors that focus on the accumulation of personal power and status. Indeed, we

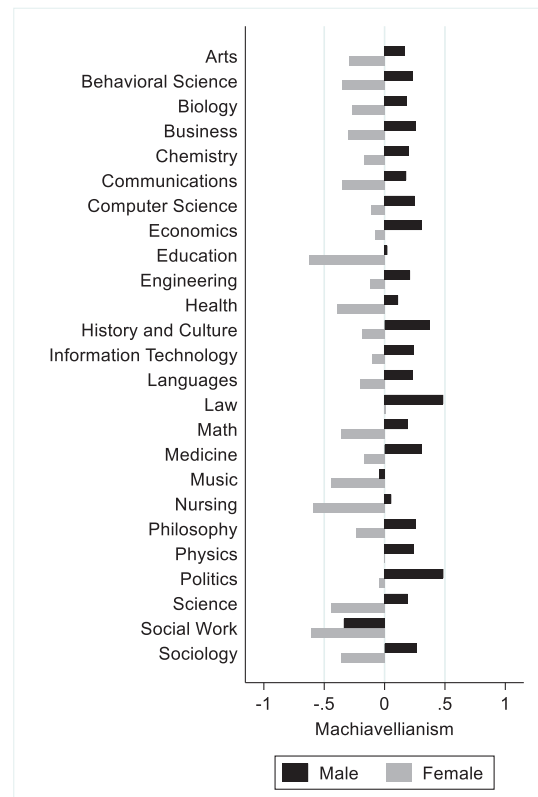


Fig. 2. Machiavellianism scores by selected college majors and sex.

found that individuals who chose majors that focus on providing care for others (e.g., Education, and Social Work) reported much lower Machiavellianism scores than participants who chose “thing-oriented” college majors focused on competition and getting ahead (e.g., Economics, Law, and Politics). These differences were also evident when examining closely related college majors, such as Medical (negative association with Machiavellianism) and Medicine (positive association with Machiavellianism).

Second, we also found significant sex differences between majors. Sex seems to drive overall differences in Machiavellianism between majors, likely because a) women tend to score lower on Machiavellianism than men and b) certain majors attract more female students than male students (e.g., Nursing). This effect is largely due to the consistency between academic major selection and traditional gender stereotypes (e.g., Dickson, 2010).

Finally, while we found some differences in Machiavellianism scores in a handful of majors when comparing, for example, Hungary to the U.S. (see Table SM-1), differences in Machiavellianism scores were relatively minor across most majors in the examined countries. One exception was Economics. Here, Machiavellian scores were lower in all other examined countries than in the United States. While it could be that Economics attracts more Machiavellian personality profiles in the U.S., it is important to note that observations across majors in other countries were more limited than in the U.S. Nevertheless, we do encourage future research to explore this association more closely.

Finally, we encourage educators and educational institutions to keep in mind the importance of students’ personality traits. Modifying and adapting teaching methods and course curriculum design to academic-major-specific student personality profiles would allow for a more engaging learning environment (Vedel, 2016). This, in turn, could encourage students to focus on attaining careers that could serve both their competitive nature and desire for status as well as contribute positively to society at large (e.g., defense and corporate attorneys, central bankers, local and national politicians, etc.).

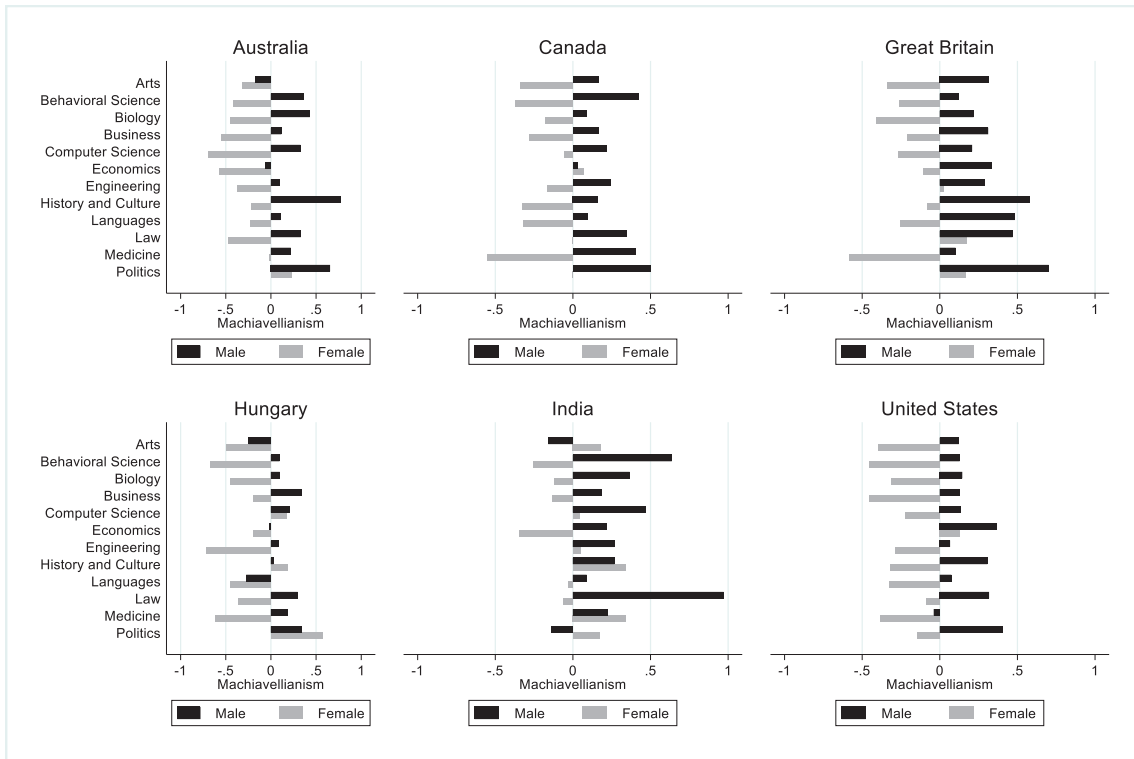


Fig. 3. Machiavellianism scores by main college major and sex across example countries.

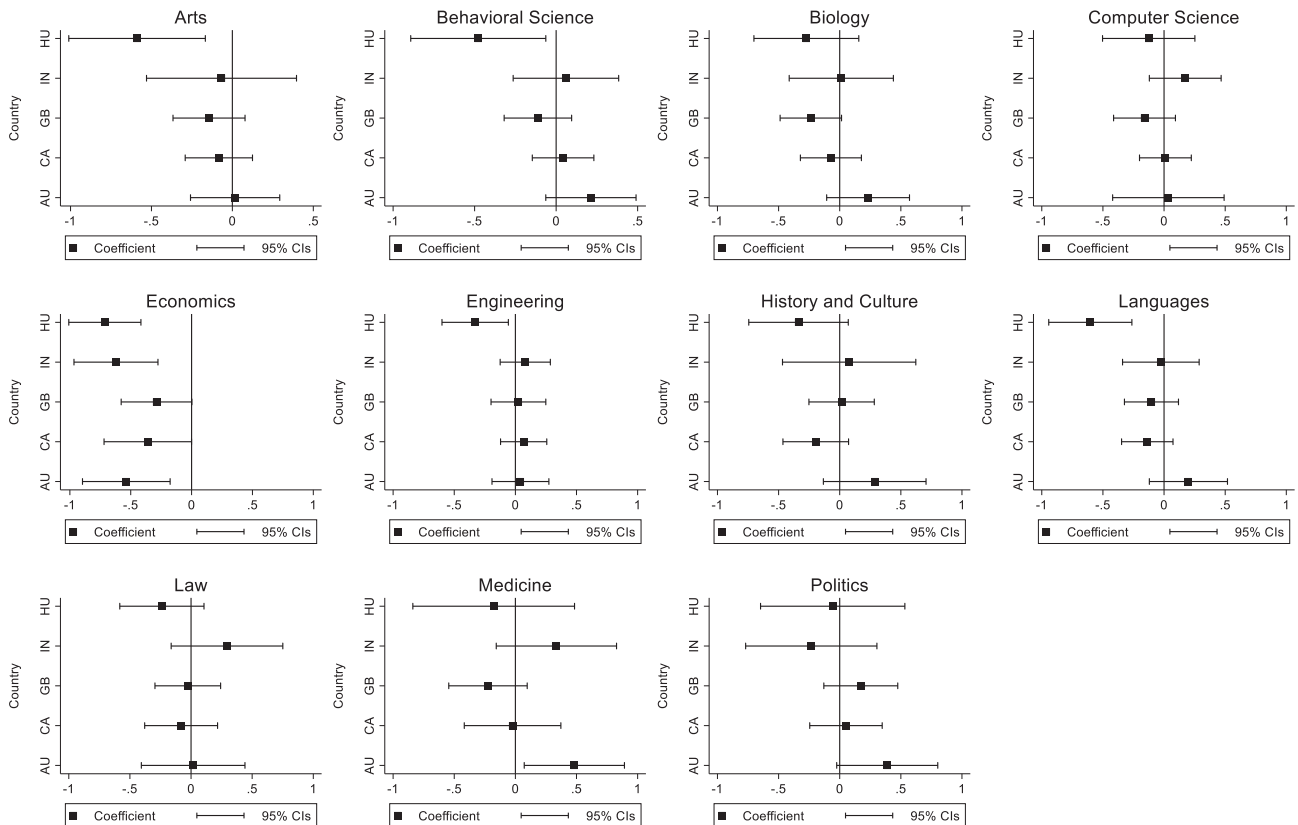


Fig. 4. Two-way interaction coefficients by college major across example countries.

Note: Native English-speaking countries are clustered together; AU = Australia, CA = Canada, GB = Great Britain, HU = Hungary, IN = India; United States of America = baseline country; Business = baseline major; $n = 35,018$.

6. Limitations

We rely on a publicly available convenience dataset (administered in English), which comes with certain limitations. For example, while the MACH-IV has been used extensively to measure Machiavellianism, it is a one dimensional measure. An examination of individual facets of Machiavellianism would allow for a more fine-grained assessment of the examined association. Second, while we provide an overview of Machiavellianism scores across countries, we encourage future cross-cultural studies to take into account additional contextual factors (e. g., curriculum, the historical relevance of certain majors, etc.), which might also be driving academic major choices across countries.

7. Conclusion

In this study, we examined the association between Machiavellianism and academic major choices in a large sample. We analyze the results based on sex and country and discuss relevant findings.

CRedit authorship contribution statement

Dritjon Gruda: Conceptualization, Methodology, Formal analysis, Writing – review & editing. **Jim McCleskey:** Writing – original draft, Writing – review & editing. **Issa Khoury:** Data curation.

Data availability

The data that has been used in this paper is publicly available (link

provided in methods section).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2023.112096>.

References

- Christie, R., & Geis, F. L. (1970). *Studies in Machiavellianism*. New York, NY: Academic.
- Dickson, L. (2010). Race and gender differences in college major choice. *Annals of the American Academy of Political and Social Science*, 627(1), 108–124.
- Galotti, K. M., Ciner, E., Altenbaumer, H. E., Geerts, H. J., Rupp, A., & Woulfe, J. (2006). Decision-making styles in a real-life decision: Choosing a college major. *Personality and Individual Differences*, 41(4), 629–639.
- Harris, J. A. (1993). Personalities of students in three faculties: Perception and accuracy. *Personality and Individual Differences*, 15(3), 351–352.
- Jonason, P. K., Żemojtel-Piotrowska, M., Piotrowski, J., Sedikides, C., Campbell, W. K., Gebauer, J. E., Maltby, J., Adamovic, M., Adams, B. G., & Kadiyono, A. L. (2020). Country-level correlates of the dark triad traits in 49 countries. *Journal of Personality*, 88(6), 1252–1267.
- McCleskey, J. A. (2013). The dark side of leadership: Measurement, assessment, and intervention. *Business Renaissance Quarterly*, 8(2–3), 35–53.
- Monaghan, C., Bizumic, B., & Sellbom, M. (2018). Nomological network of two-dimensional machiavellianism. *Personality and Individual Differences*, 130, 161–173.
- Vedel, A. (2016). Big five personality group differences across academic majors: A systematic review. *Personality and Individual Differences*, 92, 1–10.
- Vedel, A., & Thomsen, D. K. (2017). The dark triad across academic majors. *Personality and Individual Differences*, 116, 86–91.