# Gender-based differences in the impact of Dark Triad traits on academic dishonesty: The mediating role of moral disengagement in college students

Susana K. Lingán-Huamán [a,*], Sergio Dominguez-Lara [b], Renzo Felipe Carranza Esteban [a]

[a] Carrera de Psicología, Facultad de Ciencias de la Salud, Universidad San Ignacio de Loyola, Lima, Peru
[b] South American Center for Education and Research in Public Health, Universidad Privada Norbert Wiener, Lima, Peru

ARTICLE INFO

ABSTRACT

This study explores whether gender differences influence the components of the Dark Triad of personality and moral disengagement on the manifestations of dishonest academic behavior in Peruvian university students. Moreover, it evaluates how moral disengagement mediates the effect that the Dark Triad components have on academic dishonesty. The participants were 591 university students, aged between 18 and 40 years (women = 71.7 %; $M_{age}$ = 21.5; $SD_{age}$ = 3.60), to whom the Dirty Dozen Dark Triad, the Propensity to Morally Disengage Scale, and the Scale of Academic Dishonesty, which has 3 dimensions (cheating on exams, plagiarism, and falsification) were applied. The results reveal that only Machiavellianism has a significant and consistent influence on all dimensions of academic dishonesty, in both men and women, while psychopathy influences the dimension of plagiarism in both men and women and falsification only in men. In addition, moral disengagement affects falsification in both groups, cheating on exams only in the men's group, and plagiarism in the women's group. Finally, the mediating role of moral disengagement between the effect of the Dark Triad and the manifestations of academic dishonesty was not demonstrated.

## 1. Introduction

Scientific research, considered a relevant activity in the university environment, necessitates students to acquire knowledge, skills, and values in the training process. However, academic dishonesty (AD) is a phenomenon that hinders these goals and generates increasing interest in the scientific community.

AD has serious consequences for not only the students who incur it but also the academic community as a whole [1], because bad practices or inappropriate behaviours that constitute AD can lead to inequality in performance. This implies that students who work hard and strive to do the right thing are disadvantaged in grades [2]. It can also affect reputation, as it undermines trust in academic integrity.

AD is a global problem confronting education and in recent years, its prevalence has increased worldwide in alarming proportions. The literature reports that the percentage of university students who admitted to having committed some type of AD (plagiarism,

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cheating on exams, dishonest participation in tasks, or presenting work done by another) is 42 % in Spain [3], 68 % in United States [4], 77 % in Canada [5], 47 % in Malaysia [6], 48 % in Russia [7], and 97 % in Croatia [8].

In Peru, no official figures of the significance of AD have been documented; however, research shows that it occurs frequently in university classrooms. A qualitative study found that plagiarism has become a common practice that originates within school and is honed during university education [9]. Moreover, students lack a clear understanding of plagiarism as an academic offense, which is underscored by factors justifying this activity such as lack of recognition when they are engaging in plagiarism, pursuit of best results with minimum effort, and fear of disapproval. Thus, students perceive plagiarism as a normal and permitted practice at university [10].

While the prevalence of AD in the university context demonstrates the relevance of its study, AD is difficult to define precisely [11]. According to some authors, the main obstacles to its approach from research are related to two aspects. First, the ethical and moral character underlying its definition implies a reference to a time and specific sociocultural context [12,13]; second, the diversity of the operational definition adopted in different research and educational settings [14].

Considering the above, AD is defined as an intentional behavior that violates the honor and ethical codes of universities, societies, and academics [1]—that is, it constitutes transgressive behavior aimed at achieving positive results (e.g., good grades) in education [2]; or as any fraudulent activity within in the academic environment, which can range from plagiarism to deception [15]. In this study, AD refers to any behavior that transgresses the ethical norms and principles established by educational institutions and professional associations reflecting the values of the society to which they belong.

Based on the literature review [12,14,16–18], we examined AD manifestations mainly in three scenarios: exams, plagiarism, and falsification of information. In the first scenario, behaviors such as using notes or material not allowed in exams, copying the work from classmates with or without their consent, allowing others to copy one's work, and impersonating or allowing themselves to be impersonated [19] are described. Regarding plagiarism, reference is made to the partial or total copy of information, the source of which is not cited; thus, students pretend it is theirs [19]. In McCabe and Treviño's pioneering works, plagiarism was already identified as the most widespread form of AD in university classrooms [18]. Finally, falsification of information refers to the act of partially or fully distorting information to be used in the presentation of academic works, altering attendance records or justifying absenteeism as due to illness, and purchasing or selling academic assignments [13].

One interest focus in AD research is the study of predictive factors. In this scenario, some authors suggest classifying the predictors into three relevance factors: demographic variables, contextual influences, and individual characteristics [20]. Individual characteristics are examined the most owing to the relation between AD and one's personality. Three socially aversive traits of the Dark Triad (DT) theory of personality are included: psychopathy, Machiavellianism, and narcissism [21]. People with high psychopathy are more impulsive and less empathic [21], characterized by emotional callousness, deception, and lack of remorse [22].

Individuals with a high level of Machiavellianism tend to manipulate others for advantage [21]. At a cognitive level, they are characterized by pragmatic thinking, in a way that they suppress their emotions for the creation and maintenance of manipulation tactics, perceive others as a means to achieve their goals, and prioritize competition values over moral values [23]. Finally, people with high narcissism show a sense of grandiosity, superiority, and dominance, with high levels of self-centeredness and self-esteem [24].

Prior research has shown that DT traits are associated with AD behaviors in students. Specifically, students with higher levels of psychopathy reported more frequent AD [25,26]; furthermore, moral disinhibition and psychopathic mastery goal orientation were found to predict the frequency of academic cheating behaviors [26,27]. Moreover, Machiavellianism was positively associated with academic misconduct [28,29–31], such that people with a high level of Machiavellianism carefully strategize their academic cheating behavior [27]. Finally, narcissists are willing to commit AD acts to succeed and impress others academically [32]. However, no studies explore the predictive power of DT traits on AD behaviors in the Peruvian context.

Additionally, although there is evidence that DT may be an AD predictor variable, considering the role of moral disengagement (MD) as a variable that interacts in the relationship between personality and AD is necessary to achieve a comprehensive study of this last variable. Thus, MD is conceptualized as the voluntary inactivation of self-regulatory processes, leading to selective use of a series of socio-cognitive mechanisms and favoring the transgression of norms [33,34]; that is, when individuals become morally detached, they can commit acts that go against internal moral standards without feeling guilty [33].

Bandura described eight cognitive mechanisms by which MD can occur [33]. *Moral justification* refers to the rationale for an immoral act as virtuous or acceptable based on the perceived potential outcome. For example, a student who cheats on a test may justify their action by indicating that they are doing it to not disappoint their parents. *Euphemistic labeling* occurs when subtler language distorts immoral behavior into acceptable behavior, such as referring to cheating on a test as seeking assistance. *Advantageous comparison* refers to the justification of immoral behavior by comparing it with even more harmful or serious acts; for example, by pointing out that "plagiarizing is nothing compared with stealing." The *displacement of responsibility* refers to attributing responsibility for dangerous behaviors to an authority figure who exerts pressure or gives orders. The *diffusion of responsibility* occurs when immoral behavior is shared, such that no person involved in the act believes that they are entirely guilty of said event as it is a trend; for example, when students say "I cheat on the exam because everyone else does." The *distortion of consequences* refers to the minimization of the impact or effect of immoral conduct, thereby preventing the appearance of a feeling of guilt or responsibility. *Dehumanization* refers to the denial of human qualities of the victim of the immoral act, framing them as bestial while justifying the act. Finally, the *attribution of blame* holds the victim accountable as the cause of the problem.

Previous studies have revealed that MD is a relevant predictor of AD [35–38], and other authors have found that students who commit acts of AD are more likely to morally disengage from their transgressions by rationalizing their behaviors as common and justifiable [39]. In this way, the MD mechanisms that would enable AD would be related to the reinterpretation of said behaviors and, consequently, to the minimization or distortion of the consequences of AD. In fact, it has been shown that students who commit academic cheating use strategies to justify unethical behavior or behavior contrary to university norms [40]. Thus, MD would allow

students to restructure their actions to make them appear less harmful and inhibit the self-sanctions that would encourage following the rules and behaving ethically in the academic environment. For this reason, they use MD, so as to free themselves from self-condemnation and the anguish that comes with behaviors that violate academic norms. Therefore, MD can be understood as a mediating variable between DT and AD, as these traits act as trends toward specific ways of acting and thinking that influence the ethical decision-making process, wherein MD affects moral reasoning that allows individuals to assess their immoral actions as being acceptable [41], which would make dishonest behavior in the academic environment easier.

Meanwhile, a comprehensive study of AD entails considering gender, as previous studies have not only revealed differences regarding AD, with men presenting higher scores than women [16,42,43], but there is also evidence that the degree of influence of the AD predictors varies if the sample constitutes men or women [44].

These differences can be understood based on the gender socialization theory [45], which suggests that gender plays a key role in moral decision making, owing to differences in child socialization experiences, which explains the existence of differences around the moral orientation of men and women. In the case of women, morality is oriented toward relationships and caring for others; thus, it is assumed that they would be more sensitive to ethics, more respectful of the rules, and more concerned about the consequences of their actions. In men, however, morality is oriented toward justice and personal achievement, which is why they tend to be more individualistic, competitive, and more open to risk. This is consistent with the findings of studies in which threats of AD sanctions were more effective in deterring women than men [46], demonstrating that women are more sensitive to embarrassment and disappointment if they are caught cheating [44].

In this scenario, this study aimed to find out whether MD mediates the effect that DT components have on AD manifestations in Peruvian university students (Fig. 1), analyzing the differences according to gender. This is supported by the evidence provided although previous studies have examined individual factors and situations that could predict AD in university students [27]. Then, it is still necessary to test models that elucidate the relationship between these factors, including mediator variables that play a role in the decision-making process that lead to committing or tolerating acts of AD in the Peruvian context due to the relevance of these variables in the educational setting, as well as the scarce research with Peruvian students, which could increase knowledge of AD from an explanatory design. This is important, as a broader understanding of the factors involved in AD will enable more effective prevention and management strategies [3], considering that these are normalized behaviors within the university environment [8] and will subsequently affect the student's professional life.

The working hypotheses are as follows.

**H1.** The dimensions of DT directly and positively predict AD in men and women.

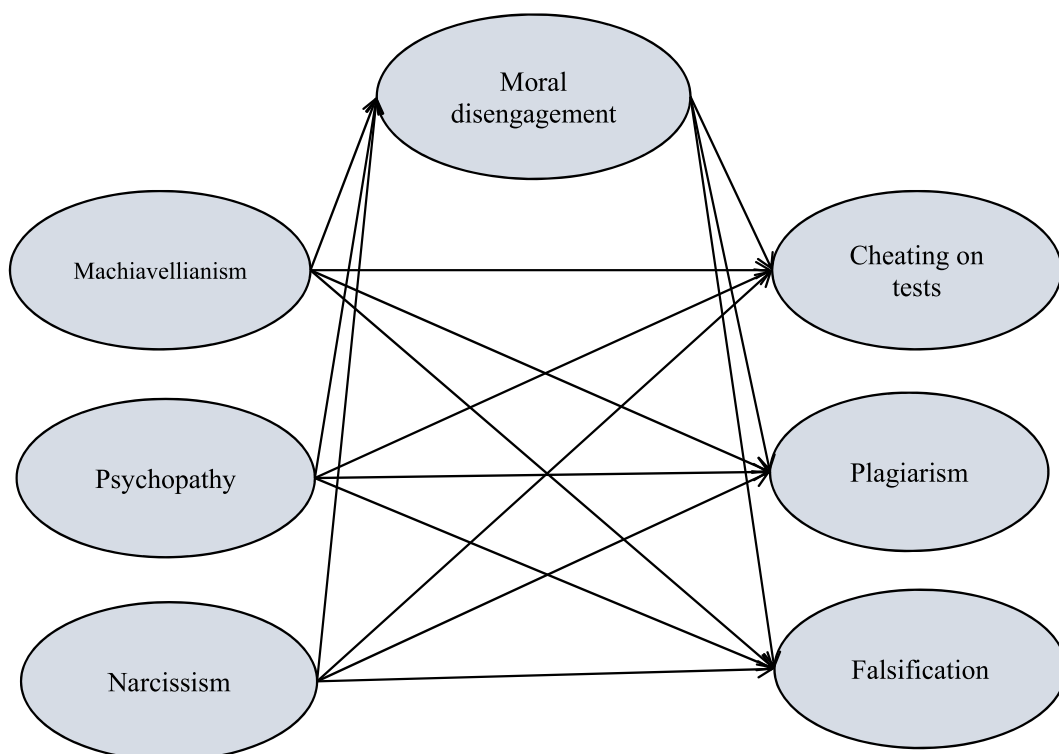**H2.** MD directly and positively predicts AD in men and women.



**Fig. 1.** Hypothesized model.

**H3.** DT dimensions, considering the mediating role of MD, indirectly and positively influence AD in men and women.

**H4.** The influence of DT dimensions on AD is more significant in men.

**H5.** The influence of MD on AD is more significant in men.

## 2. Material and methods

### 2.1. Participants

A structural equation modeling–oriented method was used to calculate the minimum sample size needed [47]. In this sense, considering the minimum expected effect size (.30), number of latent variables (7), and number of items (38), a sample of at least 247 people is suggested.

A total of 591 university students participated, of whom 424 (71.7 %) were women and 167 (28.3 %) men, all were residents of Metropolitan Lima, aged between 18 and 40 years old (M = 21.5; SD = 3.60). Further, 77 % studied at private universities, while 23 % studied at public universities. Undergraduate students from different majors were included, with the most frequent being majors being social sciences (e.g., anthropology; 25.9 %) and health sciences (e.g., nursing; 24 %). In addition, 37.2 % were initial education students (semester 1–3), 36.2 % were intermediate education students (semester 4–7), and 26.6 % were advanced education students (semester 8–10 or more). Participant selection was conducted through an intentional nonprobabilistic sampling.

### 2.2. Measurements

#### 2.2.1. Academic Dishonesty Scale [19]

It is a multidimensional measure of AD comprising 18 items organized into 3 subscales: cheating on tests, plagiarism, and falsification. The context-adapted version was used [48]. The items are scaled in a Likert format with five options ranging from *never* (1 point) to *many times* (5 points). According to the data obtained for this research, the measure achieved an acceptable reliability in both men ($\alpha = ,860$; $r_{ij} = 0.442$) and women ($\alpha = ,794$; $r_{ij} = 0.338$).

#### 2.2.2. Propensity to Morally Disengage Scale [49]

It is a one-dimensional scale comprising eight items that represent the moral mechanisms proposed by Bandura, and it measures the propensity of people to morally disengage. The version adapted to the Spanish spoken in Peru was used. The items have a Likert-type response format with seven alternatives: from *totally disagree* (1 point) to *totally agree* (7 points). Regarding reliability, coefficients were higher in cheating on exams (men: $\alpha = ,896$; $r_{ij} = 0.685$; women: $\alpha = ,865$; $r_{ij} = 0.479$), plagiarism (men: $\alpha = ,860$; $r_{ij} = 0.607$; women: $\alpha = ,777$; $r_{ij} = 0.391$) and narcissism (men: $\alpha = ,852$; $r_{ij} = 0.589$; women: $\alpha = ,892$; $r_{ij} = 0.626$).

#### 2.2.3. Dirty Dozen Dark Triad [24]

This scale measures the DT personality traits and comprises 12 items organized into 3 subscales: Machiavellianism, psychopathy, and narcissism. The version adapted to the Peruvian context was used [50]. Items are scored on a five-point Likert-type scale: from *never* (1 point) to *almost always* (5 points). Regarding reliability, favorable indicators were obtained in Machiavellianism (men: $\alpha = ,919$; $r_{ij} = 0.622$; women: $\alpha = ,829$; $r_{ij} = 0.552$), psychopathy (men: $\alpha = ,872$; $r_{ij} = 0.536$; women: $\alpha = ,707$; $r_{ij} = 0.381$) and narcissism (men: $\alpha = ,932$; $r_{ij} = 0.733$; women: $\alpha = ,826$; $r_{ij} = 0.558$).

### 2.3. Procedure

The research was approved by the Ethics Committee of the Graduate School of Universidad Peruana Unión (Reference: 2023-CE-EPG-00028). To collect data, a virtual questionnaire was designed through the Google Forms platform. The link was distributed through email and social networks, such as Facebook and WhatsApp. In the first section of the questionnaire, the informed consent was presented, in which the aim of the study and the anonymous and voluntary nature of participation in this study were disclosed, in compliance with the guidelines provided by the Declaration of Helsinki and the Code of ethics of the College of Psychologists of Peru [51]. Subsequently, the questionnaires were presented, and at the end, a thank you for participating was given.

### 2.4. Data analysis

#### 2.4.1. Estimation and software

The measurement models were analyzed with the Mplus v. 7 [52]. To test the research hypotheses, a structural regression model [53] was used with the weighted least square mean and variance adjusted with polychoric correlation matrix estimation method. Meanwhile, the bias method was analyzed with the FACTOR software [54].

#### 2.4.2. Preliminary and reliability analysis

Preliminarily, reliability was estimated using the $\alpha$ coefficient and the average inter-item correlation ($r_{ij}$), as the magnitude of the $\alpha$ coefficient is influenced by the number of items. Regarding the $\alpha$ coefficient, magnitudes between 0.65 (less than 6 items per dimension) and 0.70 (more than 6 items per dimension) were considered acceptable [55]; concerning the $r_{ij}$, magnitudes between 0.15

and 0.20 are acceptable for broad constructs, such as SD [56].

Subsequently, the approximation to univariate normality was analyzed using the magnitude of skewness ($<2$) and kurtosis ($<7$) [57]. Meanwhile, concerning multivariate normality, a multivariate kurtosis coefficient of Mardia [58] less than 70 [59] was considered adequate.

Complementarily, the method bias was evaluated considering the study's cross-sectional nature and the use of self-reports in all cases. In this sense, the Harman's single factor test was carried out, that is, it was analyzed simultaneously using an exploratory factor analysis, considering the impact of the method bias associated with the use of self-reports if the variance explained by all the items exceeds 50 % [60].

Before the model analysis, a comparison was made between men and women concerning each variable included in the analysis. These differences were assessed using an effect size approach (d): $\leq$0.20, insignificant difference; between 0.20 and 0.50, small; between 0.50 and 0.80, moderate; and $>$0.80, large [61].

### 2.4.3. Model analysis

A structural regression model [53] representing the influence of DT on AD dimensions was analyzed considering MD as a mediator in men and women separately (Fig. 1).

First, an oblique model that included all the variables involved in the model was analyzed [53], and then the measured invariance of the oblique model and the structural model among the groups mentioned was assessed.

Initially, the viability of the oblique model was determined by the magnitude of the fit indices: CFI $>$0.90 [62,63] and the RMSEA $<$0.08 [64]. After that, the measurement invariance was assessed considering gradual restrictions, that is, the configural, weak, and strong invariance suggested the statistical equivalence of the measurement model, the factor loadings, and the *thresholds*, respectively [65]. Accordingly, the evidence of invariance was assessed considering the variation of the CFI and RMSEA fit indices between models: Measurement invariance is not supported if $\Delta$CFI $< -0.01$ and $\Delta$RMSEA $\geq$0.015 [66].

Once the measurement invariance was confirmed, the structural model was evaluated in each group separately, highlighting the direct and indirect effects ($\gamma$) from an effect size approach: those smaller than .30 were considered as small effects; between 0.30 and 0.50, moderate; and greater than 0.50, large [67]. Moreover, the explained variance of the dependent variables (MD and the AD dimensions) were quantified similarly to the $R^2$ [68]: it was insignificant if it was less than 0.04; between 0.04 and 0.25, it was deemed to be small; between 0.25 and 0.64, moderate; and large if greater than 0.64 [69].

Subsequently, the structural invariance of the model between men and women was assessed in two stages. In the first stage, one without restrictions of equality of the influence parameters was established as the base model (unrestricted model); in the second, the limitation of equality of all the parameters involved (restricted model) was included (e.g., the influence of *narcissism* on MD is similar in men and women). These restricted and unrestricted models were compared at a general and specific level. In general, with the fit indices' variation and the statistical difference in the $\chi^2$ statistic [70]; at a specific level, comparing the influence level on the criterion variables through coefficient $q$.

**Table 1**
Descriptive and comparative analysis of the variables.

| | | Descriptive Statistics | | Distribution Statistics | | M Difference |
|---|---|---|---|---|---|---|
| | | *M* | *SD* | $g_1$ | $g_2$ | *d* |
| **Moral Disengagement** | | | | | | |
| MD | Me | 20.024 | 9.976 | 0.985 | 0.543 | .537 |
| | W | 15.550 | 7.584 | 1.810 | 4.481 | |
| **Dark Triad** | | | | | | |
| Machiavellianism | Me | 8.180 | 4.027 | 0.933 | 0.305 | .510 |
| | W | 6.564 | 2.760 | 1.352 | 2.256 | |
| Psychopathy | Me | 8.174 | 3.868 | 0.932 | 0.450 | .395 |
| | W | 6.908 | 2.907 | 1.074 | 0.912 | |
| Narcissism | Me | 9.856 | 4.060 | 0.114 | −0.867 | .245 |
| | W | 8.920 | 3.731 | 0.431 | −0.593 | |
| **Academic Dishonesty** | | | | | | |
| Cheating on exams | Me | 14.713 | 6.563 | 0.832 | −0.025 | .399 |
| | W | 12.547 | 4.907 | 1.326 | 2.257 | |
| Plagiarism | Me | 12.204 | 5.225 | 0.761 | −0.414 | .452 |
| | W | 10.262 | 3.873 | 1.353 | 2.510 | |
| Falsification | Me | 8.120 | 4.389 | 1.311 | 0.395 | .587 |
| | W | 6.224 | 2.641 | 3.383 | 13.548 | |

Note: M: Mean; SD: Standard deviation; $g_1$: Asymmetry; $g_2$: Kurtosis; d: Cohen's d; α: Cronbach's alpha; $r_{ij}$: Average inter-item correlation; Me: Men; W: Women.

## 3. Results

### 3.1. Preliminary descriptive and reliability analysis

Depending on the magnitude of the asymmetry and kurtosis, univariate normality in both men and women can be approached (Table 1). However, the magnitude of the Mardia coefficient exceeded the limit in both groups ($G2_{men} = 273.677$; $G2_{women} = 498.775$).

Regarding reliability, the estimates reached adequate magnitudes in all cases ($\alpha > 0.70$; y rij $>0.20$). Meanwhile, as regards the analysis of the bias of the method, the variance explained by all the items did not exceed the limit in men (36.479 %) and women (30.642 %). Finally, regarding comparative analysis, men score significantly higher in all the dimensions studied (Table 1).

### 3.2. Invariance of the structural regression model

The oblique model presented an acceptable fit in men and women separately (Table 2, section A). An analysis of measurement invariance was then performed, and the changes in the CFI and RMSEA from one model to the other provide favorable evidence for configural, weak, and strong invariance (Table 2, section B). In turn, the structural model that establishes the previously specified influence (Fig. 1) was analyzed separately in men and women, and it obtained a favorable adjustment (Table 2, section C).

The first hypothesis of the study *(the DT dimensions directly and positively predict AD in men and women)* was partially supported, as only *Machiavellianism* showed significant and consistent influence in all dimensions of AD in both groups, while *psychopathy* influenced *plagiarism* dimension in both men and women but *falsification* only in men (Table 3).

The second hypothesis *(MD directly and positively predicts AD in men and women)* was also partially supported—MD influenced *falsification* in both men and women, *cheating on tests* in men, and *plagiarism* in women (Table 3).

Finally, the third hypothesis *(DT dimensions, considering the mediating role of MD, indirectly and positively influence AD in men and women)* was not empirically supported as all indirect effects were nonsignificant.

Complementarily, the variance of the MD explained by the dimensions of the DT (R2) was of moderate magnitude and similar between men and women ($R^2_{men} = 0.318$, CI 95 % 0.193, 0.443; $R^2_{women} = 0.300$, CI 95 % 0.202, 0.398). Regarding the $R^2$ of the AD dimensions, the influence of the predictors on cheating on tests was greater in men ($R^2_{men} = 0.674$, CI 95 % 0.580, 0.768) than in women ($R^2_{women} = 0.483$, CI 95 % 0.393, 0.573). Meanwhile, these differences were reduced in the plagiarism dimension ($R^2_{men} = 0.592$, CI 95 % 0.476, 0.708; $R^2_{women} = 0.461$, CI 95 % 0.365, 0.557) and *falsification* ($R^2_{men} = 0.603$, CI 95 % 0.464, 0.742; $R^2_{women} = 0.551$, CI 95 % 0.449, 0.653) but were nonetheless higher in men.

Next, the structural invariance was explored, that is, whether the influence remains invariant between men and women. After analyzing the model without restrictions in each group, an acceptable fit was obtained (Section C, Table 2). Subsequently, the models with and without restrictions were compared and no statistically significant differences were found between them ($\Delta\chi^2/gl$ (15) = 22.668, $p = .092$), albeit some influence coefficients presented descriptive differences ($q > 0.10$; Table 3).

Thus, the fourth hypothesis *(The influence of DT dimensions on AD is greater in men)* was partially supported, as only the influence of *psychopathy on plagiarism* and *falsification* is greater in men than in women, while only the influence of *Machiavellianism* on *falsification* is greater in women (Table 3).

Finally, the fifth hypothesis *(The influence of MD on AD is greater in men)* was not supported as the influence of MD on *cheating on exams* was alone observed to be greater in men (Table 3).

## 4. Discussion

Research on predictive models that elucidate AD is relevant, as this phenomenon has serious and harmful consequences for societies, enabling people with undermined morality and uncorroborated professional skills to join the workforce and economic gear of nations. Therefore, to deepen the study of AD and its relationships with other psychological variables, this study examined whether the

**Table 2**
Structural and measurement invariance analysis.

| | CFI | RMSEA (IC 90 %) | WRMR | ΔCFI | ΔRMSEA |
|---|---|---|---|---|---|
| Section A: Oblique model | | | | | |
| Men | 0.968 | .059 (.052–.065) | 1.005 | – | – |
| Women | 0.935 | .050 (.046–.054) | 1.201 | – | – |
| Section B: Measurement Invariance | | | | | |
| Configural | 0.954 | .052 (.048–.055) | 1.566 | – | – |
| Metric | 0.961 | .047 (.043–.050) | 1.673 | 0.007 | −0.005 |
| Strong | 0.954 | .049 (.045–.052) | 1.651 | −0.007 | 0.002 |
| Section C: Structural Invariance | | | | | |
| SM men | 0.968 | .059 (.052–.065) | 1.005 | – | – |
| SM women | 0.935 | .050 (.046–.054) | 1.201 | – | – |
| SM not restricted | 0.954 | .052 (.048–.055) | 1.566 | – | – |
| SM restricted | 0.958 | .049 (.045–.052) | 1.599 | 0.004 | −0.005 |

Note: SM: Structural Model; CFI: Comparative fit index; RMSEA: Root mean square error of approximation; WRMR: Weighted root mean square residual.

**Table 3**
Direct and indirect effects on men and women.

|  | Men | Women | q |
|---|---|---|---|
| **Direct Effects** | | | |
| Machiavellianism → MD | 0.146 | 0.069 | 0.076 |
| Psychopathy →MD | **0.435** | **0.493** | 0.047 |
| Narcissism → MD | −0.008 | 0.000 | 0.008 |
| MD → Cheating on tests | **0.227** | 0.028 | **0.195** |
| MD → Plagiarism | 0.177 | **0.251** | 0.071 |
| MD → Falsification | **0.279** | **0.362** | 0.075 |
| Machiavellianism → Cheating on tests | **0.655** | **0.693** | 0.025 |
| Psychopathy → Cheating on tests | 0.009 | 0.025 | 0.016 |
| Narcissism → Cheating on tests | 0.021 | −0.044 | 0.065 |
| \Machiavellianism → Plagiarism | **0.194** | **0.216** | 0.021 |
| Psychopathy → Plagiarism | **0.412** | **0.266** | **0.130** |
| Narcissism → Plagiarism | 0.093 | 0.085 | 0.008 |
| Machiavellianism → Falsification | **0.230** | **0.605** | **0.315** |
| Psychopathy → Falsification | **0.398** | 0.007 | **0.371** |
| Narcissism → Falsification | −0.043 | −0.163 | **0.119** |
| **Indirect Effects** | | | |
| Machiavellianism → MD → Cheating on tests | 0.033 | 0.002 | 0.031 |
| Psychopathy → MD → Cheating on tests | 0.099 | 0.014 | 0.085 |
| Narcissism → MD → Cheating on tests | −0.002 | 0.000 | 0.002 |
| Machiavellianism → MD → Plagiarism | 0.026 | 0.017 | 0.009 |
| Psychopathy → MD → Plagiarism | 0.077 | 0.124 | 0.046 |
| Narcissism → MD → Plagiarism | −0.001 | 0.000 | 0.001 |
| Machiavellianism → MD → Falsification | 0.041 | 0.025 | 0.016 |
| Psychopathy → MD → Falsification | 0.121 | 0.178 | 0.056 |
| Narcissism → MD → Falsification | −0.002 | 0.000 | 0.002 |
| **Total Effects** | | | |
| Machiavellianism → Cheating on tests | **0.688** | **0.695** | 0.004 |
| Psychopathy → Cheating on tests | 0.108 | 0.039 | 0.069 |
| Narcissism → Cheating on tests | 0.019 | −0.044 | 0.063 |
| Machiavellianism → Plagiarism | **0.220** | **0.233** | 0.013 |
| Psychopathy → Plagiarism | **0.489** | **0.390** | 0.082 |
| Narcissism → Plagiarism | 0.092 | 0.085 | 0.007 |
| Machiavellianism → Falsification | **0.271** | **0.630** | **0.294** |
| Psychopathy → Falsification | **0.519** | 0.185 | **0.294** |
| Narcissism → Falsification | −0.045 | −0.163 | **0.116** |

Note: MD: Moral disengagement; q: Cohen's q.

components of DT and MD predict AD manifestations in Peruvian university students while evaluating how MD mediates the effect that personality DT components have on AD manifestations and differentiating the results according to gender.

As regards the first hypothesis of this study (DT dimensions directly and positively predict AD in men and women), it was found that only Machiavellianism has a significant and consistent influence on all AD dimensions in men and women. This implies that subjects with high Machiavellianism are more prone to committing plagiarism, cheating on exams, and falsifying documents in the academic field, which would be explained by the search for personal and educational benefits, given that on many occasions, universities offer scholarships or grants according to the position of the student in the classroom ranking. Similar findings were found by Curtis [28] in English-speaking students coming from 20 different countries, by Esteves et al. [29] in Brazilian university students, by Veríssimo et al. [30] in Portuguese medical students, and by Hidalgo-Fuentes et al. [31] in Spanish university students; which indicates the possible cross-cultural nature of this association.

Meanwhile, it was found that psychopathy influences only the plagiarism dimension in both groups, and it influences falsification only in men. The inconsistent findings on the relationship between psychopathy and AD are presented in the previous literature [5,26, 29] and could be explained based on the differences in the meanings of dishonest behavior in the academic field, which is more or less normalized depending on dominant cultural patterns. Thus, a trend toward psychopathy would be irrelevant regarding some forms of AD deemed less punishable because they are considered harmless or of little impact (e.g., copying a homework assignment). In addition, research suggests that primary (or genetic) psychopathy, but not secondary (or socially-based) psychopathy, is associated with AD [5]. While this distinction is not made in this study, it has been reported that the conception of psychopathy from DT would be closer to secondary psychopathy [71]. Thus, it is reasonable that it is not associated with all forms of AD, considering the characteristics of the studied context already described in the initial section of this article.

Although it was unexpected that narcissism is not a relevant predictor of AD neither in men nor in women, as reported by some investigations conducted in a population close to the Peruvian [29], other previous studies are partially consistent with the reported results found in this study. For example, in Brunell et al.'s [32] study, only the exhibitionism factor of narcissism was associated with AD, while the dimensions of seeking power and belief in being a special person were not relevant factors in predicting AD. In addition, in Curtis's study [28] narcissism was not a significant predictor of academic misconduct in university students.

Regarding this study's second hypothesis, it was found that MD directly and positively predicts some AD manifestations;

specifically, falsification in men and women, cheating on tests only in men, and plagiarism only in women. These findings could be explained with the characteristics of MD that facilitate student dishonest behavior by restructuring moral reasoning and inhibiting self-sanctions that allow transgressions to become acceptable actions. Thus, students would justify their actions by postulating some type of positive meaning for their academic or professional life and, therefore, the positive consequences (e.g., a better grade) would lead to a repetition of that dishonest behavior pattern. These results are similar to those found by other researchers [35,37], although in these studies MD was shown to be a predictor variable of all types of AD, including cheating, falsification, and plagiarism. Along the same lines, this study's findings are consistent with those of Farnese et al. [36], who reported positive associations between academic cheating behaviors and students' MD. However, previous studies did not segment the analyses according to the participants' gender, which could be necessary considering that the experiences of socialization and internalization of norms are different between men and women.

Meanwhile, the third hypothesis (DT dimensions, considering the mediating role of the MD, indirectly and positively influence AD in men and women) was not empirically support, as all indirect effects were nonsignificant. These results suggest that, without the mediation of MD, DT traits, especially psychopathy and Machiavellianism, may emerge as predictors of some AD manifestations. Therefore, the cognitive restructuring of acts of academic transgression allowing university students to inhibit self-sanctions would not affect the decision-making process. This probably indicates that dishonest behaviors have become commonplace, and incurring them does not generate student conflict.

The fourth hypothesis (The influence of DT dimensions on AD is greater in men) was partially supported, with the influence of psychopathy on plagiarism and falsification found to be greater in men than in women, while the influence of Machiavellianism on falsification was greater in women. Although these results are not directly comparable with previous studies, they are consistent with Zhang et al.'s [44] findings that the explanatory models of AD and the influence level of some independent variables can vary when the participant sample is segmented according to gender. However, in the said study, the forms of AD have not been differentiated and have been considered as predictors other than those in the present study.

To understand the findings hereof, it is suggested to delve into the gap that exist in the meaning of the different AD manifestations, according to gender, in addition to the differences in expression and behavior patterns linked to DT traits, especially psychopathy and Machiavellianism, in men and women. For example, in the case of psychopathy, it has been found that, although men and women with high levels of psychopathy show emotional deficits, the expression of said deficits is not evident to the same extent. Moral information is processed differently, including the response to injustice and moral violations, with women being the most interested in the preservation of equity [72]. Additionally, it has been found that men with high levels of psychopathy tend to commit or actively support behaviors that are harmful to others. Meanwhile, women with high levels of psychopathy tend to passively endorse offending behaviors, such as allowing harm to occur or through manipulation [73]. This may explain why psychopathy is a more relevant predictor of plagiarism behavior for the male group compared with the female group, in addition to being a relevant predictor of falsification behavior only in men. Further, the greater influence of psychopathy in men would be explained by individualism, competitiveness, and openness to risk [45], as the goal is to achieve favorable results, while shame and disappointment that women would experience if they were discovered committing a dishonest act [44] would inhibit them from engaging in such behavior.

Regarding Machiavellianism, some studies have reported that men with high scores in Machiavellianism are more self-controlled and more concerned about the future consequences of their actions than women [74]. Moreover, Machiavellianism in men has been found to be positively correlated with planning, while Machiavellianism in women is negatively correlated with planning [75]. This may explain why Machiavellianism is a more relevant predictor for committing acts of falsification in the female group compared with the male group.

Finally, the fifth hypothesis (The influence of MD on AD is greater in men) is not supported, as merely the impact of MD on cheating on exams was observed to be greater in men. In this regard, although it is known that men are more vulnerable to MD than women [34, 76], it appears that both men and women with high levels of MD are likely to commit dishonest acts in the academic field, especially behavior related to falsification. Considering that MD's influence on the behavior of cheating on tests is found only in the male group and that on plagiarism behavior only in the female group, future research could expand this line of study, exploring whether these contrasts can be justified based on the differences in the perception of severity or the consequences of the different forms of AD according to gender.

Additionally, as expected, men were found to have significantly higher scores on all AD dimensions, which is consistent with the findings of previous studies [16,35,42–46]. This corroborates Gilligan's argument [45] that the manifestations of morality differ between men and women owing to differences in gender socialization experiences; thus, men are more likely to disobey rules than women, who are more concerned about the consequences of their actions than men.

### 4.1. Limitations and future directions

There are some limitations to the interpretations of this study's results. The first refers to the use of convenience sampling that prevents the generalization of results; however, it is essential to consider that the study sample was sought to be heterogeneous, including students from public and private universities, from different careers and university training cycles. Nonetheless, the results should be considered with caution. Another limitation is linked to the cross-sectional nature of the research design that limits the investigation of causal relationships between the variables. Accordingly, development of longitudinal studies or experimental design is recommended. A third limitation is that only three forms of AD manifestations were measured; thus, we encourage future studies to deepen the understanding of the AD phenomenon, covering other types of manifestations that have not been explored. Fourth, the variables were measured through self-reports, which could have generated the existence of social desirability bias. Fifth, a virtual

platform was used for data collection, which may have introduced a selection bias, since only students with Internet access and experience in responding to online surveys have been able to participate, excluding university students residing in areas with limited Internet access. Therefore, it would be important to replicate the study using physical data collection. Sixth, in this study, the facets of each of the DT traits (e.g., narcissism) were not differentiated; thus, in future research, their association with MD and AD could be studied in depth.

Finally, it would be interesting for subsequent studies to delve into the mediating role of other variables, perhaps examining those of a situational or contextual nature, such as competition environments, classroom climate, teaching strategies, and teacher evaluation. These would allow us to identify useful factors to discourage dishonest behavior in students.

### 4.2. Conclusions and practical implications

We conclude that DT influences AD behaviors although this may vary according to gender, only Machiavellianism has a significant and consistent influence on all AD dimensions in men and women. Furthermore, narcissism could not be evidenced as a relevant predictor of AD in any of the groups. Finally, although DM was shown to directly influence some AD manifestations, its mediating role between the DT effect and the AD manifestations could not be demonstrated.

This study contributes to the literature on AD and its relationship with DT and MD in university students. The findings provide an approach to understanding how dysfunctional personality traits may predict the manifestations of AD in university students. In addition, differentiating the relationship of these variables according to gender have presented novel findings. Thus, it is crucial that future research continues to investigate these individual differences while predicting AD, as our understanding of how these behaviors develop in both men and women is pivotal in devising preventive strategies and intervention measures in the educational environment that foster academic integrity in future professionals.

### Ethical declarations

This study was reviewed and approved by the Ethics Committee of the Graduate School of Universidad Peruana Unión, with the approval number: 2023-CE-EPG-00028.

All participants provided informed consent to participate in the study.

### Data availability statement

Data will be available on request.

### CRediT authorship contribution statement

**Susana K. Lingán-Huamán:** Writing - review & editing, Writing - original draft, Methodology, Investigation, Conceptualization. **Sergio Dominguez-Lara:** Writing - review & editing, Writing - original draft, Formal analysis, Data curation, Conceptualization. **Renzo Felipe Carranza Esteban:** Writing - review & editing, Writing - original draft, Methodology.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

[1] K.M. Kura, T.S. Ahmad, L. Kontagora Hafsat, Predicting dishonest academic behaviours: the roles of attitude, subjective norms, perceived behavioural control and moral obligation, InjET 4 (2018) 1–11. http://www.injet.upm.edu.my.
[2] A.D. Miller, T.B. Murdock, M.M. Grotewiel, Addressing academic dishonesty among the highest achievers, Theory Into Pract. 56 (2017) 121–128, https://doi.org/10.1080/00405841.2017.1283574.
[3] A. Cerdà-Navarro, C. Touza, M. Morey-López, E. Curiel, Academic integrity policies against assessment fraud in postgraduate studies: an analysis of the situation in Spanish universities, Heliyon 8 (2022), e09170, https://doi.org/10.1016/j.heliyon.2022.e09170.
[4] D.L. Mccabe, Cheating among college and university students: a North American perspective, Int. J. Educ. Integr. 1 (2005), https://doi.org/10.21913/IJEI.v1i1.14.
[5] M. Ternes, C. Babin, A. Woodworth, S. Stephens, Academic misconduct: an examination of its association with the dark triad and antisocial behavior, Pers. Indiv. Differ. 138 (2019) 75–78, https://doi.org/10.1016/j.paid.2018.09.031.
[6] R. Mustapha, Z. Hussin, S. Siraj, G. Darusalam, Academic dishonesty among higher education students: the Malaysian evidence (2014 to 2016), KATHA 13 (2017) 73–93, https://doi.org/10.22452/KATHA.vol13no1.4.
[7] N. Maloshonok, E. Shmeleva, Influencing academic dishonesty among undergraduate students at Russian Universities, J. Acad. Ethics 17 (2019) 313–329, https://doi.org/10.1007/s10805-019-9324-y.
[8] S.K. Taradi, M. Taradi, Z. Dogaš, Croatian medical students see academic dishonesty as an acceptable behaviour: a cross-sectional multicampus study, J. Med. Ethics 38 (2012) 376–379, https://doi.org/10.1136/medethics-2011-100015.
[9] T. Ramos Quispe, E.F. Damian Nuñez, M.G. Inga Arias, D. Arias Chávez, M.J. Caurcel Cara, Actitudes hacia el plagio en estudiantes de Administración de Empresas de dos universidades privadas en Arequipa, Propósitos y Representaciones 7 (2019) 33–45, https://doi.org/10.20511/pyr2019.v7n1.264.
[10] A.B. Duche-Pérez, D. Arias-Chávez, T. Ramos-Quispe, O.A. Gutiérrez-Aguilar, Representaciones sociales de estudiantes universitarios peruanos sobre el plagio en la escritura académica, Revista Conrado 16 (2020) 155–162. https://conrado.ucf.edu.cu/index.php/conrado/article/view/1225.

[11] E.G. Lambert, N.L. Hogan, S.M. Barton, Collegiate academic dishonesty revisited: what have they done, how often have they done it, who does it, and why did they do it, Electron. J. Sociol. 7 (2003) 1–27. https://sociology.lightningpath.org/ejs-archives/vol7.4/lambert_etal.html.

[12] R. Comas, J. Sureda, A. Casero, M. Morey, La integridad académica entre el alumnado universitario español, Estud. Pedagog. 37 (2011) 207–225, https://doi.org/10.4067/S0718-07052011000100011.

[13] D. Thomas, Factors that explain academic dishonesty among university students in Thailand, Ethics Behav. 27 (2017) 140–154, https://doi.org/10.1080/10508422.2015.1131160.

[14] J.D. Vaamonde, A. Omar, La deshonestidad académica como un constructo multidimensional, Rev. Latinoam. Estud. Educ. 38 (2008) 7–27. https://www.redalyc.org/pdf/270/27012440002.pdf.

[15] R. Jurdi, H.S. Hage, H.P.H. Chow, What behaviours do students consider academically dishonest? Findings from a survey of Canadian undergraduate students, Soc. Psychol. Educ. 15 (2012) 1–23, https://doi.org/10.1007/s11218-011-9166-y.

[16] A. Błachnio, Don't cheat, be happy. Self-control, self-beliefs, and satisfaction with life in academic honesty: a cross-sectional study in Poland, Scand. J. Psychol. 60 (2019) 261–266, https://doi.org/10.1111/sjop.12534.

[17] C. Blanch-Mur, F. Rey-Abella, A. Folch-Soler, Nivel de conducta académica deshonesta entre los estudiantes de una escuela de ciencias de la salud, Enferm Clin 16 (2006) 57–61, https://doi.org/10.1016/S1130-8621(06)71182-2.

[18] D.L. McCabe, L.K. Treviño, Academic Dishonesty, J Higher Educ. 64 (1993) 522–538, https://doi.org/10.1080/00221546.1993.11778446.

[19] H. Marsden, M. Carroll, J.T. Neill, Who cheats at university? A self-report study of dishonest academic behaviours in a sample of Australian university students, Aust. J. Psychol. 57 (2005) 1–10, https://doi.org/10.1080/00049530412331283426.

[20] L. Donse, I.H. Van De Groep, Academic dishonesty among college students: predictors and interventions, Social Cosmos 4 (2013) 40–50. https://dspace.library.uu.nl/handle/1874/272629.

[21] D.L. Paulhus, K.M. Williams, The Dark Triad of personality: narcissism, machiavellianism , and psychopathy, J. Res. Pers. 36 (2002) 556–563, https://doi.org/10.1016/S0092-6566(02)00505-6.

[22] J.M. LeBreton, J.F. Binning, A.J. Adorno, Subclinical psychopaths, in: J.C. Thomas, D. Segal (Eds.), Comprehensive Handbook of Personality and Psychopathology. Personality and Everyday Functioning, John Wiley and Sons, Inc., New York, 2006, pp. 388–411.

[23] T. Bereczkei, The manipulative skill: cognitive devices and their neural correlates underlying Machiavellian's decision making, Brain Cogn 99 (2015) 24–31, https://doi.org/10.1016/j.bandc.2015.06.007.

[24] P.K. Jonason, G.D. Webster, The dirty dozen: a concise measure of the dark triad, Psychol. Assess. 22 (2010) 420–432, https://doi.org/10.1037/a0019265.

[25] J. Zhang, D.L. Paulhus, M. Ziegler, Personality predictors of scholastic cheating in a Chinese sample, Educ. Psychol. (2018), https://doi.org/10.1080/01443410.2018.1502414.

[26] L. Baran, P.K. Jonason, Academic dishonesty among university students: the roles of the psychopathy, motivation, and self-efficacy, PLoS One 15 (2020), e0238141, https://doi.org/10.1371/journal.pone.0238141.

[27] K.M. Williams, C. Nathanson, D.L. Paulhus, Identifying and profiling scholastic cheaters: their personality, cognitive ability, and motivation, J. Exp. Psychol. Appl. 16 (2010) 293–307, https://doi.org/10.1037/a0020773.

[28] G.J. Curtis, It Kant be all bad: contributions of Light and Dark Triad traits to academic misconduct, Pers. Indiv. Differ. 212 (2023), 112262, https://doi.org/10.1016/j.paid.2023.112262.

[29] G.G.L. Esteves, L.S. Oliveira, J.M. de Andrade, M.P. Menezes, Dark triad predicts academic cheating, Pers. Indiv. Differ. 171 (2021), https://doi.org/10.1016/j.paid.2020.110513.

[30] A.C. Veríssimo, G.A.M. Conrado, J. Barbosa, S.F. Gomes, M. Severo, P. Oliveira, L. Ribeiro, Machiavellian medical students report more academic misconduct: a cocktail fueled by psychological and contextual factors, Psychol. Res. Behav. Manag. 15 (2022) 2097–2105, https://doi.org/10.2147/PRBM.S370402.

[31] S. Hidalgo-Fuentes, I.M. Álvarez, M.J.S. Baeza, El papel de la Triada Oscura en la procrastinación académica y la deshonestidad académica, RACC 14 (2022) 32–40.

[32] A.B. Brunell, S. Staats, J. Barden, J.M. Hupp, Narcissism and academic dishonesty: the exhibitionism dimension and the lack of guilt, Pers. Indiv. Differ. 50 (2011) 323–328, https://doi.org/10.1016/j.paid.2010.10.006.

[33] A. Bandura, Selective activation and disengagement of moral control, J. Soc. Issues 46 (1990) 27–46, https://doi.org/10.1111/j.1540-4560.1990.tb00270.x.

[34] A. Bandura, Selective moral disengagement in the exercise of moral agency, J. Moral Educ. 31 (2002) 101–119, https://doi.org/10.1080/0305724022014322.

[35] S. Ampuni, N. Kautsari, M. Maharani, S. Kuswardani, S.B.S. Buwono, Academic dishonesty in Indonesian college students: an investigation from a moral psychology perspective, J. Acad. Ethics 18 (2020) 395–417, https://doi.org/10.1007/s10805-019-09352-2.

[36] M.L. Farnese, C. Tramontano, R. Fida, M. Paciello, Cheating behaviors in academic context: does academic moral disengagement matter? Procedia Soc Behav Sci 29 (2011) 356–365, https://doi.org/10.1016/j.sbspro.2011.11.250.

[37] W.M. Firdaus, Solicha, the determinants of academic dishonesty in college student, in: Universitas Indonesia International Psychology Symposium for Undergraduate Research, Atlantis Press, 2018, https://doi.org/10.2991/uipsur-17.2018.45.

[38] S. Risser, K. Eckert, Investigating the relationships between antisocial behaviors, psychopathic traits, and moral disengagement, Int. J. Law Psychiatr. 45 (2016) 70–74, https://doi.org/10.1016/j.ijlp.2016.02.012.

[39] D.L. McCabe, L.K. Treviño, K.D. Butterfield, Cheating in academic institutions: a decade of research, Ethics Behav. 11 (2001) 219–232, https://doi.org/10.1207/S15327019EB1103_2.

[40] A.E. Jordan, College student cheating: the role of motivation, perceived norms, attitudes, and knowledge of institutional policy, Ethics Behav. 11 (2001) 233–247, https://doi.org/10.1207/S15327019EB1103_3.

[41] J.R. Detert, L.K. Treviño, V.L. Sweitzer, Moral disengagement in ethical decision making: a study of antecedents and outcomes, J. Appl. Psychol. 93 (2008) 374–391, https://doi.org/10.1037/0021-9010.93.2.374.

[42] L.C. Hensley, K.M. Kirkpatrick, J.M. Burgoon, Relation of gender, course enrollment, and grades to distinct forms of academic dishonesty, Teach, High Low Rep. 18 (2013) 895–907, https://doi.org/10.1080/13562517.2013.827641.

[43] G.D. Sideridis, I. Tsaousis, K. Al Harbi, Predicting academic dishonesty on national examinations: the roles of gender, previous performance, examination center change, city change, and region change, Ethics Behav. 26 (2016) 215–237, https://doi.org/10.1080/10508422.2015.1009630.

[44] Y. Zhang, H. Yin, L. Zheng, Investigating academic dishonesty among Chinese undergraduate students: does gender matter? Assess Eval. High Educ. 43 (2018) 812–826, https://doi.org/10.1080/02602938.2017.1411467.

[45] C. Gilligan, In a Different Voice: Psychological Theory and Women's Development, Harvard University Press., Cambridge, Massachusetts, 1982.

[46] C.R. Tittle, A.R. Rowe, Moral appeal, sanction threat, and deviance: an experimental test, Soc. Probl. 20 (1973) 488–498, https://doi.org/10.2307/799710.

[47] D.S. Soper, A-Priori Sample Size Calculator for Structural Equation Models, 2022. https://bit.ly/3w6XbTN.

[48] S. Dominguez-Lara, S.K. Lingan-Huamán, Escala de Deshonestidad Académica en estudiantes universitarios: estructura interna y asociación con autoeficacia académica, Anu. de Psicol. 52 (2022) 209–219, https://doi.org/10.1344/anpsic2022.52/3.2.

[49] C. Moore, J.R. Detert, L. Klebe Treviño, V.L. Baker, D.M. Mayer, Why employees do bad things: moral disengagement and unethical organizational behavior, Pers Psychol 65 (2012) 1–48, https://doi.org/10.1111/j.1744-6570.2011.01237.x.

[50] A. Copez-Lonzoy, S. Dominguez-Lara, C. Merino-Soto, ¿Inestabilidad en el lado oscuro? Estructura factorial, invarianza de medición y fiabilidad de la Dirty Dozen Dark Triad en población general de Lima, Rev. de Psicopatol. 24 (2019) 153–162, https://doi.org/10.5944/rppc.24335.

[51] Colegio de Psicólogos del Perú, Código de ética y deontología, 2017. https://www.cpsp.pe/documentos/marco_legal/codigo_de_etica_y_deontologia.pdf.

[52] L.K. Muthén, B.O. Muthén, Mplus User's Guide, Muthén & Muthén, 1998.

[53] R.B. Kline, Principles and Practice of Structural Equation Modeling, The Guilford Press, New York, 2016.

[54] P.J. Ferrando, U. Lorenzo-Seva, 10 años del programa FACTOR: una revisión crítica de sus orígenes, desarrollo y líneas futuras, Psicothema 29 (2017) 236–240, https://doi.org/10.7334/psicothema2016.304.

[55] J.G. Ponterotto, R.A. Charter, Statistical extensions of ponterotto and ruckdeschel's (2007) reliability matrix for estimating the adequacy of internal consistency coefficients, Percept. Mot. Skills 108 (2009) 878–886, https://doi.org/10.2466/PMS.108.3.878-886.

[56] L.A. Clark, D. Watson, Constructing validity: basic issues in objective scale development, Psychol. Assess. 7 (1995) 309–319, https://doi.org/10.1037/1040-3590.7.3.309.

[57] S.J. Finney, C. DiStefano, Non-normal and categorical data in structural equation modeling, in: G.R. Hancock, R.O. Mueller (Eds.), Structural Equation Modeling. A Second Course, Information Age Publishing, Greenwich, Connecticut, 2006, pp. 269–314.

[58] K.V. Mardia, Measures of multivariate skewness and kurtosis with applications, Biometrika 57 (1970) 519–530, https://doi.org/10.2307/2334770.

[59] M. Rodriguez, M. Ruiz, Atenuación de la asimetría y de la curtosis de las puntuaciones observadas mediante transformaciones de variables: incidencia sobre la estructura factorial, Psicologica 29 (2008) 205–227. https://www.uv.es/psicologica/articulos2.08/6RODRIGUEZ.pdf.

[60] P.M. Podsakoff, S.B. MacKenzie, J.Y. Lee, N.P. Podsakoff, Common method biases in behavioral research: a critical review of the literature and recommended remedies, J. Appl. Psychol. 88 (2003) 879–903, https://doi.org/10.1037/0021-9010.88.5.879.

[61] J. Cohen, A power primer, Psychol. Bull. 112 (1992) 1155–1159, https://doi.org/10.1037/14805-018.

[62] R. Blackburn, J.P. Donnelly, C. Logan, S.J.D. Renwick, Convergent and discriminative validity of interview and questionnaire measures of personality disorders in mentally disordered offenders: a multitrait-multimethod analysis using confirmatory factor analysis, J. Pers. Disord. 18 (2004) 129–150, https://doi.org/10.1521/pedi.18.2.129.32779.

[63] H.W. Marsh, K.T. Hau, Z. Wen, In search of golden rules: comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings, Struct. Equ. Model. 11 (2004) 320–341, https://doi.org/10.1207/s15328007sem1103_2.

[64] M.W. Browne, R. Cudeck, Alternative ways of assessing model fit, Socio. Methods Res. 21 (1992) 230–258, https://doi.org/10.1177/0049124192021002005.

[65] L.L. Pendergast, N. von der Embse, S.P. Kilgus, K.R. Eklund, Measurement equivalence: a non-technical primer on categorical multi-group confirmatory factor analysis in school psychology, J. Sch. Psychol. 60 (2017) 65–82, https://doi.org/10.1016/j.jsp.2016.11.002.

[66] F.F. Chen, Sensitivity of goodness of fit indexes to lack of measurement invariance, Struct. Equ. Model. 14 (2007) 464–504, https://doi.org/10.1080/10705510701301834.

[67] E. Miranda-Zapata, L. Lara, J.J. Navarro, M. Saracostti, X. de-Toro, Modeling the effect of school engagement on attendance to classes and school performance, Rev. Psicodidáctica 23 (2018) 102–109, https://doi.org/10.1016/j.psicod.2018.02.003.

[68] M.J. Lachowicz, K.J. Preacher, K. Kelley, A novel measure of effect size for mediation analysis, Psychol. Methods 23 (2018) 244–261, https://doi.org/10.1037/met0000165.

[69] C.J. Ferguson, An effect size primer: a guide for clinicians and researchers, Prof. Psychol. Res. Pract. 40 (2009) 532–538, https://doi.org/10.1037/a0015808.

[70] T. Asparouhov, B. Muthen, Robust Chi Square Difference Testing with Mean and Variance Adjusted Test Statistics, 2006. http://www.statmodel.com/download/webnotes/webnote10.pdf.

[71] B.O. Yildirim, J.J.L. Derksen, Systematic review, structural analysis, and new theoretical perspectives on the role of serotonin and associated genes in the etiology of psychopathy and sociopathy, Neurosci. Biobehav. Rev. 37 (2013) 1254–1296, https://doi.org/10.1016/j.neubiorev.2013.04.009.

[72] L.M. Efferson, A.L. Glenn, Examining gender differences in the correlates of psychopathy: a systematic review of emotional, cognitive, and morality-related constructs, Aggress. Violent Behav. 41 (2018) 48–61, https://doi.org/10.1016/j.avb.2018.05.009.

[73] H.D. Gummelt, J.C. Anestis, J.L. Carbonell, Examining the levenson self report psychopathy scale using a graded response model, Pers. Indiv. Differ. 53 (2012) 1002–1006, https://doi.org/10.1016/j.paid.2012.07.014.

[74] P.K. Jonason, J. Tost, I just cannot control myself: the Dark Triad and self-control, Pers. Indiv. Differ. 49 (2010) 611–615, https://doi.org/10.1016/j.paid.2010.05.031.

[75] E. Szabó, D.N. Jones, Gender differences moderate machiavellianism and impulsivity: implications for Dark Triad research, Pers. Indiv. Differ. 141 (2019) 160–165, https://doi.org/10.1016/j.paid.2019.01.008.

[76] M.E. De Caroli, E. Sagone, Mechanisms of moral disengagement: an analysis from early adolescence to youth, Procedia Soc Behav Sci 140 (2014) 312–317, https://doi.org/10.1016/j.sbspro.2014.04.426.