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Psychometric properties of the Propensity to Morally Disengage Scale in Peruvian university students: internal structure and association with the dark triad

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Introduction: Human morality is an important topic because the fact that human beings can determine if a behavior is correct or incorrect, good or bad, shows that they are endowed with moral conscience, but In the Peruvian context, there are no valid and reliable scales to measure moral disengage trend. This study aimed to analyze the psychometric properties of the Propensity to Morally Disengage Scale in Peruvian university students.

Method: The number of university students who participated in the study was 591 (women = 71.7%; M_{age} = 21.5; SD_{age} = 3.60), and the data analysis was carried out under a factor analysis approach.

Results: The results showed a unidimensional structure in both men and women. As for the invariance results according to sex, there is favorable evidence of configural and weak invariance; however, there is no evidence of strong invariance. Furthermore, the reliability of the construct (coefficient ω) and its scores (coefficient α) reached acceptable dimensions in each group and positive associations with the dark triad (Machiavellianism, psychopathy, and narcissism).

Discussion: The Propensity to Morally Disengage Scale is a unidimensional measurement that shows acceptable psychometric evidence in men and women separately. The theoretical and practical implications are discussed.

KEYWORDS

moral disengagement, internal structure, measurement invariance, psychometrics, university students

1 Introduction

Human morality is an important topic that is of great interest for research in different disciplines. The fact that human beings can determine if a behavior is correct or incorrect, good or bad, shows that they are endowed with moral conscience. Therefore, questions about morality are raised based on the need to coexist in harmony, since without consensual moral codes, people would disengage from the rights and wellbeing of others every time their wishes come into social conflict (Bandura, 1990). In this way, social codes and sanctions are articulated with collective moral imperatives and have an impact on social behavior (Bandura, 1990, 1991, 1999).

Albert Bandura introduced the concept of moral disengagement (hereinafter MD) from the social cognitive learning theory. Within this framework, MD is defined as the voluntary inactivation of the self-regulation processes that lead to the selective use of a series of socio-cognitive mechanisms that favor transgressing rules, as well as the disinhibition of aggressive impulses and immoral behaviors (Bandura, 1990, 2002). These mechanisms imply reinterpreting harmful and inhumane behaviors, minimizing the role of damage perpetrators or making it darker, falsifying or distorting the consequences of violent or immoral behavior, and blaming and dehumanizing victims.

Such theory states that moral operation is self-regulated by showing some self-control on behavior, judgments of such behavior, and on the arising affective responses. While developing the moral self, people adopt rules on what is correct and incorrect, through direct or indirect experiences of the environment where they develop, and such rules guide behavior (Bandura, 1990, 1999, 2002). That way, self-behavior is supervised and judged according to internal moral rules and the circumstances where it is produced. For that reason, individuals try to behave in a way that keeps them from transgressing their own moral rules so as to avoid self-condemnation. Such continuous self-evaluation motivates and regulates moral behavior, acting as an activation and inhibition system. However, self-regulation mechanisms depend on the context and they also allow moral self-sanctions to be selectively disassociated from the non-moral behavior (Bandura, 1990, 1999, 2002).

In this context, MD (Bandura, 1990) provides a specific model that explains how people transgress their personal ethics. Normally, people seek consistency between what they think is right and their behaviors, since any discrepancies between both aspects normally generates feelings of psychological discontent. In this way, MD is based on the cognitive restructuring of immoral behavior, which turns it into justified behavior. That is, if people can step away from their moral rules, it is easier to justify their participation in behaviors that they would normally consider immoral.

Therefore, Bandura (1990) described eight cognitive mechanisms that can generate MD. The first three of these mechanisms make the cognitive restructuring of cruel and unlawful acts easier. Hence, in this manner, actions can seem less harmful and somehow beneficial. *Moral justification* refers to justifying an unlawful act as being acceptable depending on the perceived potential result. *Euphemistic labeling* occurs when certain language is used to hide the blame by distorting what happened. *Advantageous comparison* refers to justifying an unlawful act by comparing it to even more harmful acts. The next two cognitive mechanisms minimize the individual's role in the damage caused. Thus, in *displacement of responsibility*, the responsibility of harmful or unlawful behaviors tends to be attributed to some authority figure that exercises pressure or issues orders. *Diffusion of responsibility* occurs when immoral behavior is shared, the trend being that no person involved in the unlawful act finds themselves completely guilty of such event. The three last cognitive mechanisms distort the effects of self-actions. *Distortion of consequences* means minimizing the impact or effect of the unlawful behavior. *Dehumanization* means denying the human qualities or characteristics of the victim of the unlawful act in order to refer to them as brutal. Finally, *attribution of blame* proposes that the blame of unlawful acts lies in provoking the victim that caused the problem. The eight mechanisms mentioned above restructure the way people make decisions or perform non-moral actions.

Individuals' trend toward MD is an important indicator of society's wellbeing. This can be seen in the scientific evidence that shows how MD is associated with frequent social problems, such as crime (Shulman et al., 2011), aggression and violence in different environments (Bandura et al., 1996; Obermann, 2011; Gini et al., 2014; Wang et al., 2017), alcohol and other drug consumption (Newton et al., 2012; Passini, 2012), white-collar crimes (Barsky, 2011; Christian and Ellis, 2014), fraud-related conducts, (Moore et al., 2012) and antisocial behaviors (Hyde et al., 2010).

Regarding university students, it has been proven that MD is an indicator of academic dishonesty, which within the academic context can be expressed as cheating behaviors, plagiarism, and unauthorized collaboration (Farnese et al., 2011; Risser and Eckert, 2016; Ampuni et al., 2020). Furthermore, MD has been associated with cyber aggression, and aggressors are those students that use, to a larger extent, the advantageous comparison, distortion of consequences, and attribution of blame mechanisms (Lee and Jang, 2022). It has also been proved that MD impacts the perception of violence based on belonging to a group (McCreary et al., 2016). For this reason, it can be inferred that the degree of MD of university students will affect their interpersonal relationships in fields where social bonds are relevant.

On the other hand, the foregoing literature proves that gender is an important factor to be considered when studying MD, as men get higher scores than women (Bandura, 2002; Obermann, 2011; De Caroli and Sagone, 2014; Wang et al., 2017; Gómez-Tabares and Narváez-Marín, 2019; Gómez-Tabares et al., 2021); furthermore, it has been found that gender differences in unethical behaviors increase in magnitude when considering the role of MD (Detert et al., 2008). These differences can be attributed to the role society plays in assigning gender as according to Bandura (2002), MD makes no difference in gender in the first years of life, but as time goes by, boys become more vulnerable to morally disassociate compared to girls. Thus, the vicarious and social modeling processes established during upbringing and in the first years of socialization are fundamental for the development and manifestation of moral behavior in adolescence and adulthood (Carlo et al., 1999). Gilligan (1982) states that the differences in childhood socialization experiences of girls and boys ensure that gender plays a relevant role in moral decision-making and explains the differences in moral orientation of boys and girls. Schminke (1997) offers a similar explanation, pointing out that gender socialization determines differences in the configuration of the ethical frameworks that men and women use in their moral judgments. Therefore, men's moral judgment and behavior would be oriented by the search for personal achievement, competitive success, and extrinsic rewards. In contrast, in the case of women, morality would be oriented to the care of interpersonal relationships and effective fulfillment of tasks; thus, they would be more sensitive to adhering to ethical norms and more concerned about the consequences of their actions. In Peru, these differences stand out due to gender inequalities, as it is currently ranked 90th in the Gender Inequality Index Rank and 37th in the Global Gender Gap Index Rank, which assesses gaps at the economic, political, educational and health levels (United Nations-Women, 2023).

Although previous studies have found gender differences in studies of MD, few investigations have verified the measurement invariance of the instrument used; those that do exist focus on the child population (García-Vásquez et al., 2019), which would not be extrapolable to this study. Therefore, to better understand the effect of gender on MD, the equivalence of the factorial structure of the MD measures should be studied according to gender, because, if differences are found at the statistical level, we must know whether they are due to mean bias or if they represent legitimate differences in the manifestation of MD.

The association of MD with the dark triad of personality has also been studied. It refers to the constellation of three features representing questionable social behaviors: psychopathy, narcissism, and Machiavellianism (Paulhus and Williams, 2002). Psychopathy is characterized by the absence of empathy, lack of remorse or guilt, indifference, and poor and irresponsible behavior control (Muris et al., 2017). However, Machiavellianism can be seen through cynical contempt for morality, lack of empathy, and an excessive focus on personal ambition and interest, since Machiavellian people manipulate and exploit others with the goal of obtaining personal benefits (Muris et al., 2017). Finally, narcissism is characterized by a strong need of recognition and admiration, as well as a huge sense of self-worth. Narcissist people are egocentric, and they often consider that they deserve special treatment (Muris et al., 2017).

In addition, the dimensions' characteristics of the dark personality suggest that those personalities with a high level of Machiavellianism and psychopathy are more susceptible to cross the moral boundaries that lead to poor ethical behaviors (Sijtsema et al., 2019); while people with high levels of narcissism can be drawn to transgress moral rules due to the fact that they prioritize their personal interest over the interest of others (Egan et al., 2015). In this context, several studies have proved the positive association of MD and the dark triad components in diverse groups that present perpetrators of violence against women and men in the community (Navas et al., 2022b), organizations, (Yanuari, 2022), penitentiary field (Brugués and Caparrós, 2022), adolescents (Navas et al., 2022a), consumers (Kapoor et al., 2021), and university students (Qiao et al., 2021).

Despite the relevance of MD and considering how it is associated with other variables, most of the psychological research linked to the moral field is restricted to studying moral thinking or judgment; this can be the result of the rational bias of many moral theories (Bandura, 1991) that set aside the problem of measuring the construct. This can be shown in the scarce instrumental research regarding the MD construct in Latin America, especially in Peru, where citizens perceive a lot of corruption (Transparency International, 2021).

Regarding MD measurement, Bandura et al. (1996) developed an instrument for children and adolescents that considers 32 items and measures the eight previously described mechanisms of moral disengagement. However, when analyzing the factorial structure of the instrument using the principal component method, authors found a unidimensional structure that explains 16.2% of the total variance, with a reliability of 0.82. This instrument has been adapted by different authors in different countries.

The findings of various studies that have analyzed the internal structure of the scale developed by Bandura et al. (1996) are not consistent; some authors have reported evidence in favor of the unidimensional structure (Paciello et al., 2008; Bautista et al., 2020), while other authors found a four-factor solution that corresponds to the four categories included in the moral disengagement mechanisms (Newton et al., 2016). Other studies present results supporting the eight-factor model that corresponds to each moral disengagement mechanism (Boardley and Kavussanu, 2007). Meanwhile, Rubio-Garay et al. (2017), in a sample of Spanish adolescents and youths, found evidence in favor of a structure with a general second-order factor (moral disengagement) and three first-order factors.

Additionally, there are other ways to measure MD in specific situations, such as school harassment (García-Vásquez et al., 2019), ethnic harassment (Lo Cricchio et al., 2022), legal violations (Kirshenbaum et al., 2021), non-compliance of ethical rules in research (DuBois et al., 2016), violations in the military context (McAlister, 2001), and collective moral disengagement (Gini et al., 2014), among others.

Moore et al. (2012) developed an eight-item measurement for MD that shows some advantages against the previously developed instruments. First of all, the eight moral disengagement mechanisms are evaluated in a unidimensional way this is consistent with the premise that moral disengagement is a multifaceted and not a multifactorial construct (Bandura et al., 1996). Moreover, as it is brief, the tool can be easily and rapidly implemented and uses a language than can be understood by different adult populations, which expands its application. Regarding its psychometric properties, Moore et al. (2012) used a confirmatory factor analysis that confirmed that the instrument is unidimensional; furthermore, they gathered evidence of the connection between the expected theoretical relationships of MD and other associated constructs, such as Machiavellianism ($r = 0.46$), moral identity ($r = -0.42$), empathy ($r = -0.48$), and the obtained correlations among its measurements, and the authors reported an acceptable reliability coefficient ($\alpha = 0.80$). Likewise, in Ukraine, the eight-item version was found to be the one with the most acceptable statistical indicators both at the level of internal structure and reliability (Karkovska, 2020).

In the Peruvian context, there are no valid and reliable scales to measure MD's trend, or scales that can also include the advantages shown in the scale developed by Moore et al. (2012). Accordingly, this study aims to analyze the psychometric properties of the Propensity to Morally Disengage Scale proposed by Moore et al. (2012) among Peruvian university students.

As for the research hypotheses, the internal structure is expected to be unidimensional in men and women (Hypothesis 1) given the preliminary evidence. Moreover, the measure is not expected to be invariant between men and women (Hypothesis 2) due to cultural and socialization aspects that have already been described above. Furthermore, a direct and significant relationship is expected between MD and the Dark Triad dimensions (Hypothesis 3). Further, that there are differences between men and women in relation to the association between MD and the dimensions of the Dark Triad (Hypothesis 4). Finally, that the measure presents acceptable reliability in men and women (hypothesis 5).

This study is justified because if there is a Peruvian version of the scale with adequate psychometric properties, it can be implemented in studies that address MD in a series of social phenomena where citizens' wellbeing is being violated. Examples of

such phenomena are violence; corruption, crime; and in general, all behaviors against morality and ethical principles, which take place in a country characterized by high rates of violence and corruption (Montero, 2017; Transparency International, 2021). In addition, the study of MD in university students highlights the relevance of assessing morality-related aspects in future professionals, since as the empiric evidence shows, high MD levels are associated with unethical personal and professional behaviors, which then results in an inefficient professional exercise that undermines societies' wellbeing.

2 Materials and methods

2.1 Participants

This research is an instrumental study (Ato et al., 2013). The minimum sample size required (n = 256) was defined based on specific recommendations (Soper, 2023) by considering statistical power (0.95), effect size (0.50 as the minimum value of the factorials), probability level (0.05), number of latent variables (3, for the oblique model), and number of observed variables (8 items). In this sense, intentional non-probabilistic sampling was used, where 591 university students participated (71.7% women), of Peruvian nationality who live in the Metropolitan area of Lima and within the age group between 18 and 40 years (M_{age} = 21.5; SD_{age} = 3.60). Among the participants, 77% and 23% are private and public university students, respectively. Undergraduate students from different majors and academic years were included, and the majors related to social sciences (e.g., anthropology; 25.9%) and health sciences (e.g., nursing; 24%) were the most frequent. No statistical differences were found between men and women with respect to age (t = 0.368, p = 0.713) or university of origin (χ^2 = 0.968, p = 325).

2.2 Measurements

2.2.1 Propensity to Morally Disengage Scale

Created by Moore et al. (2012), it is a unidimensional scale that measures the propensity of people to disconnect morally. It is composed of eight items and each item represents one of the mechanisms of moral disengagement proposed by Bandura (2016) (moral justification, euphemistic labeling, advantageous comparison, displacement of responsibility, diffusion of responsibility, distortion of consequences, dehumanization, and attribution of blame). The items have a Likert-type response format with seven alternatives: from *strongly disagree* (1 point) to *strongly agree* (7 points). Full questionnaire is included in the **Supplementary material**.

2.2.2 Dirty dozen dark triad (DDDT)

Created by Jonason and Webster (2010), it is a measurement of the personality dark triad that includes 12 items, organized into three sub-scales: Machiavellianism [e.g., "*Manipular a los demás para conseguir lo que quiere*." (Manipulate others to get what you want)], psychopathy [e.g., "*No preocuparse mucho por la moralidad de sus acciones*." (Not worry too much about the morality of your actions)], and narcissism [e.g., "*Querer que otras personas lo admiren*." (Want others to admire you)]. The version used was the one of Copez-Lonzoy et al. (2019), which was adapted to the Peruvian context. The items are scored using a Likert-type scale of five points: from never (1 point) to almost always (5 points). From the data collected in this research, the reliability indicators found were considered acceptable for the sub-scales of Machiavellianism (α = 0.866), psychopathy (α = 0.775), and narcissism (α = 0.838).

2.3 Procedure

The processes included translating and validating the measurement of the trend to morally disassociate, which was proposed by Moore et al. (2012). The translation process was carried out following the recommendations proposed by Guillemin et al. (1993), including the stages of initial and back translation. All were performed by different translators who did not know the content of the original instrument. The revision committee performed the evaluation and a focus group did the pre-testing.

Three professional translators with an advanced English level were considered for the initial translation stage to translate the original version of the scale into Spanish, specifically as spoken in Peru. The answers of the three translators were checked, compared, and assessed. The revision committee took into consideration the clarity criterion and made any necessary adjustments to ensure the content of the items could be understood.

After choosing the most adequate Spanish version for each of the items, the back translation was done; two translators, different from the initial three, performed an independent translation of the Spanish version of the scale into English. Finally, researchers compared the answers of the second group of translators with the original version of the instrument, and they prepared a consolidated version of the translated scale.

A focus group of 12 volunteer students (six men and six women) from a private university in Lima evaluated the clarity of the items of the consolidated version and confirmed the clarity of the translated items.

Later on, an online form was designed using the Google Forms platform that included the informed consent form, personal data sheet, and the previously presented questionnaires. The online form was shared by email and social networks like Facebook and WhatsApp during the first quarter of 2022. Emails and cell phone numbers were accessed through the records of the courses in which they were enrolled, with the consent of the students.

As part of the ethical considerations, voluntary and anonymous participation and confidentiality were guaranteed, in compliance with the guidelines provided in the Declaration of Helsinki and the ethics code of the College of Psychologists of Peru (Colegio de Psicólogos del Perú., 2017).

2.4 Data analysis

2.4.1 Validity evidence based on internal structure

A confirmatory factor analysis (CFA) of the Propensity to Morally Disengage Scale was conducted in men and women using the weighted least square mean and variance adjusted estimator

TABLE 1 Factor analysis and measurement invariance according to sex.

	CFI	TLI	NFI	RMSEA	CI 90%	WRMR	ΔCFI	ΔRMSEA
Baseline								
Men	0.934	0.907	0.917	0.148	0.118, 0.180	0.811		
Women	0.971	0.960	0.969	0.066	0.046, 0.087	0.619		
Measurement invariance								
Configural	0.953	0.934	0.937	0.097	0.081, 0.114	1.020		
Weak	0.961	0.954	0.942	0.082	0.066, 0.098	1.101	0.008	−0.015
Strong	0.930	0.955	0.933	0.081	0.069, 0.093	1.556	−0.031	−0.001

(WLSMV) due to its suitability for ordinal items (Li, 2016a,b), and the polychoric correlations matrix. Two models were evaluated; a three-factor oblique model (moral justification, diffusion of responsibility and attribution of blame; García-Vásquez et al., 2019) and a unidimensional model (Moore et al., 2012).

The models were evaluated according to the dimensions of the fit indices CFI, NFI, and TLI (>0.90; McDonald and Ho, 2002), RMSEA (<0.08; Browne and Cudeck, 1993), and WRMR (<1; DiStefano et al., 2018). Furthermore, factor loadings (>0.50; Dominguez-Lara, 2018) and potential misspecification associated to correlated residuals were considered (Saris et al., 2009). Thus, measurement invariance was assessed in the model that presented the best psychometric evidence.

2.4.2 Measurement invariance

A multi-group factor analysis was implemented to obtain evidence of the measurement invariance according to sex for which, factorial parameters were gradually restricted to evaluate the configural, weak, and strong invariance (Pendergast et al., 2017). The degree of measurement invariance was generally evaluated, considering the variation of its fit indices (CFI and RMSEA); that is, there is not enough evidence of measurement invariance if $\Delta CFI < -0.01$ and $\Delta RMSEA \geq 0.015$ (Chen, 2007). Specifically, factorial parameters were compared (factor loadings, thresholds, and residuals) under an effect size approach (ES) applied to the measurement invariance (Pornprasertmanit, 2014). When comparing the factor loadings, thresholds, and residuals, the q (0.10, small difference; 0.30, medium; 0.50, big; large, 1988), d (0.20, small difference; 0.50, medium; 0.80, large; Choi et al., 2009), and h (0.20, small difference; 0.50, medium; 0.80, large; Cohen, 1988) coefficients were used, respectively.

2.4.3 Validity evidence based on relations to other variables

Moral disengagement association with the dark triad dimensions (Machiavellianism, narcissism, and psychopathy) was analyzed using the Pearson correlation coefficient (>0.20; Ferguson, 2009), separately in men and women. A confidence interval for the difference between coefficients was obtained (CI_{diff}; Zou, 2007); that is, if the CI = 0, it is concluded that there is no significant difference in the strength of association of the variables.

2.4.4 Reliability

The construct and scores reliability were calculated by means of the omega ($\omega > 0.70$; Hunsley and Marsh, 2008) and alpha coefficient ($\alpha > 0.70$; Ponterotto and Charter, 2009), respectively, which were both compared in each group (men and women); the difference between α and ω was considered significant if is greater than | 0.06| (Gignac et al., 2007). At the same time, the comparison between men and women in such coefficients was done considering the CI_{diff} (Moreta-Herrera et al., 2021).

2.4.5 Software

The analytic-factorial processes were done with the software Mplus version 7 (Muthén and Muthén, 1998–2015), and the effect size (ES) applied to the invariance, misspecification, and comparison of the reliability coefficients with the specialized modules (Dominguez-Lara and Merino-Soto, 2018, 2019; Dominguez-Lara et al., 2018).

3 Results

3.1 Validity evidence based on internal structure

First, the three-factor oblique model was evaluated for men and women. The fit indices were adequate in men (CFI = 0.946; NFI = 0.931; TLI = 0.911; RMSEA = 0.146; CI 90% = 0.113, 0.180; WRMR = 0.706) and women (CFI = 0.982; NFI = 0.956; TLI = 0.970; RMSEA = 0.058; CI 90% = 0.035, 0.081; WRMR = 0.507), although in the case of men, the RMSEA exceeds the established value. Moreover, the interfactor correlations were high for both groups ($\phi > 0.85$), which did not provide favorable evidence of multidimensionality.

Meanwhile, the unidimensional model had an acceptable fit in men and women regarding the CFI and WRMR, although RMSEA only reached an adequate dimension in women (**Table 1**). This provides empirical support for Hypothesis 1.

In the case of men, the misspecification potential analysis suggested that the residuals of items 3 [*Considerando las formas descaradas en que las personas falsifican su información, no es pecado inflar un poco tus credenciales* (*Considering the ways people grossly misrepresent themselves, it's hardly a sin to inflate your own credentials a bit.*)] and 4 [*Las personas no deberían ser responsables por hacer cosas cuestionables cuando solo estaban haciendo lo que una autoridad les ordenó* (*People shouldn't be held accountable for doing questionable things when they were just doing what an authority figure told them to do.*)] should be associated [Modification Index (MI) = 29.483; Expected Parameter Change

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(EPC) = 0.460], in a similar way to the residuals of items 6 [*Llevarse el crédito por ideas que no son tuyas, no es gran cosa* (*Taking personal credit for ideas that were not your own is no big deal.*)] and 8 [*Las personas que son maltratadas, por lo general, han hecho algo para provocarlo* (*People who get mistreated have usually done something to bring it on themselves*)] (MI = 32.605; EPC = 0.520). However, regarding women, the results suggest the association of the residuals of items 1 [*Está bien difundir rumores para defender a los que queremos* (*It is okay to spread rumors to defend those you care about.*)] and 2 [*Es aceptable tomar algo sin el permiso del dueño, siempre y cuando solo lo tomemos prestado* (*Taking something without the owner's permission is okay as long as you're just borrowing it.*)] (MI = 16.309; EPC = 0.273), as well as the residuals of items 7 [*Algunas personas deben ser tratadas con rudeza porque no tienen sentimientos que se puedan herir* (*Some people have to be treated roughly because they lack feelings that can be hurt.*)] and 8 [*Las personas que son maltratadas, por lo general, han hecho algo para provocarlo* (*People who get mistreated have usually done something to bring it on themselves.*)] (MI = 14.218; EPC = 0.333).

3.2 Measurement invariance according to sex

The configural invariance reached adequate dimensions considering the fit indices, and the weak invariance is supported, even though the results could not endorse the strong invariance (**Table 1**). Specifically, considering the configural invariance data (**Table 2**), significant differences can be seen in the factor loading of item 2, as well as in at least half of the thresholds of six items and two residuals (**Table 3**). Consequently, the Propensity to Morally Disengage Scale is not invariant between men and women, supporting Hypothesis 2.

3.3 Validity evidence based on relations to other variables

All of the cases show significant relationships ($r > 0.20$), supporting Hypothesis 3, and without differences between men and women regarding the association between Propensity to Morally Disengage Scale and the dark triad dimensions (**Table 4**). This finding does not support Hypothesis 4.

3.4 Reliability

The reliability coefficients of the construct (coefficient ω) and scores (coefficient α) had acceptable dimensions (>0.70; **Table 5**). Nevertheless, the differences between coefficients were not significant in men ($\Delta_{\omega\ -\alpha} = 0.032$), but in women, they were ($\Delta_{\omega\ -\alpha} = 0.074$). As for the comparison between men and women, only the reliability of the scores showed significant differences (coefficient α) in favor of the group of men (**Table 5**). Taken together, these findings support Hypothesis 5.

TABLE 2 Descriptive statistics and factorial parameters (configural invariance) in men and women.

	Men										Women									
	M	SD	λ	Θ	τ 1	τ 2	τ 3	τ 4	τ 5	τ 6	*M*	SD	λ	Θ	τ 1	τ 2	τ 3	τ 4	τ 5	τ 6
Item 1	2.557	1.714	0.680	0.538	−0.224	0.192	0.569	1.002	1.390	2.075	2.007	1.603	0.636	0.596	0.205	0.734	1.004	1.304	1.502	1.787
Item 2	2.082	1.596	0.769	0.409	0.208	0.587	0.833	1.174	1.639	2.236	1.608	1.147	0.612	0.625	0.447	1.090	1.447	1.787	2.060	2.247
Item 3	2.525	1.819	0.745	0.445	−0.159	0.306	0.569	1.002	1.433	1.528	1.882	1.545	0.703	0.506	0.307	0.879	1.124	1.397	1.542	1.758
Item 4	3.304	1.980	0.563	0.683	−0.665	−0.192	0.192	0.532	0.976	1.311	2.934	1.766	0.533	0.716	−0.603	−0.037	0.379	0.916	1.276	1.562
Item 5	2.335	1.710	0.768	0.410	0.048	0.356	0.587	1.143	1.528	1.955	1.953	1.524	0.771	0.406	0.224	0.742	1.068	1.364	1.584	1.925
Item 6	2.462	1.908	0.658	0.567	0.016	0.340	0.645	0.951	1.239	1.528	1.894	1.709	0.651	0.576	0.440	0.935	1.090	1.262	1.334	1.583
Item 7	2.342	1.769	0.835	0.303	0.032	0.373	0.684	1.143	1.433	1.639	1.623	1.192	0.708	0.499	0.481	1.090	1.276	1.819	1.966	2.332
Item 8	2.570	1.617	0.755	0.430	−0.323	0.111	0.569	1.206	1.528	1.955	1.591	1.233	0.761	0.421	0.610	1.057	1.334	1.758	1.887	2.176

Factor loadings and residuals based on configural invariance; M, mean; SD, standard deviation; λ: factor loading; Θ: residual; τ_n: threshold n-ith.

TABLE 3 Measurement invariance between men and women: comparison of factor parameters using effect size.

	ES-λ	ES-τ_1	ES-τ_2	ES-τ_3	ES-τ_4	ES-τ_5	ES-τ_6	ES-Θ
Item 1	0.029	**−0.241**	**−0.304**	**0.244**	0.169	0.063	−0.162	0.117
Item 2	**0.101**	−0.128	**−0.270**	**0.329**	**0.329**	**0.226**	0.006	**0.437**
Item 3	0.026	**−0.307**	**−0.378**	**0.366**	**0.260**	0.072	0.152	0.122
Item 4	0.023	−0.029	−0.073	0.089	0.182	0.142	0.119	0.072
Item 5	−0.002	−0.100	**−0.219**	**0.274**	0.126	0.032	−0.017	−0.009
Item 6	0.005	**−0.340**	**−0.477**	**0.357**	**0.250**	0.076	0.044	0.019
Item 7	0.074	**−0.252**	**−0.402**	**0.332**	**0.379**	**0.299**	**0.389**	**0.403**
Item 8	−0.004	**−0.529**	**−0.536**	**0.433**	**0.313**	**0.203**	0.125	−0.018

ES: effect size; λ: factor loading; Θ: residual; τ_n: threshold n-ith; in bold: significant differences between men and women.

4 Discussion

This study aimed to analyze the psychometric properties of the Propensity to Morally Disengage Scale proposed by Moore et al. (2012), in its eight-item version, among Peruvian university students. Regarding the internal structure, the results found using the CFA show adequate fit indices for the single factor model in the sample of women; while in the sample of men, the fit indices had acceptable values in CFI and WRMR, but not in RMSEA. This can be explained by the fact that in the presence of asymmetric data, the RMSEA does not achieve acceptable magnitudes (Cook et al., 2009), while the magnitudes of CFI and TLI are not affected by data asymmetry (Ainur et al., 2017). Even though previous studies to contrast the findings are scarce, it can be assured that they are partially compatible with the findings of the study of Moore et al. (2012) and Karkovska (2020). Those studies show that the single factor model of the Propensity to Morally Disengage Scale has adequate fit indices, although, the psychometric analysis in the studies of Moore et al. (2012) and Karkovska (2020) were performed in the whole sample without considering the sex.

Regarding the potential misspecification analysis, in the case of women, the results suggest the association of the residuals of item 1 [*Está bien difundir rumores para defender a los que queremos* (*It is okay to spread rumors to defend those you care about.*)] and item 2 [*Es aceptable tomar algo sin el permiso del dueño, siempre y cuando solo lo tomemos prestado* (*Taking something without the owner's permission is okay as long as you're just borrowing it.*)], which corresponds to the MD mechanisms moral justification and euphemistic labeling, respectively. Thus, the common aspect among residuals, which is not part of the MD construct, is explained because both mechanisms promote the cognitive restructuring of immoral or reprehensible behaviors to turn them into less harmful behaviors (Bandura, 1990, 1991, 1999). Additionally, regarding the group of women, results suggest the association of the residuals of item 7 [*Algunas personas deben ser tratadas con rudeza porque no tienen sentimientos que se puedan herir* (*Some people have to be treated roughly because they lack feelings that can be hurt.*)] and item 8 [*Las personas que son maltratadas, por lo general, han hecho algo para provocarlo* (*People who get mistreated have usually done something to bring it on themselves.*)], which corresponds to MD mechanisms dehumanization and attribution of blame, respectively. Similar to the previous case, this association among residuals would be explained considering that both mechanisms lead to the distortion of the victim's perception, whether by denying their human qualities or by attributing the victim the responsibility of causing unlawful behaviors that have harmed them (Bandura, 1990, 1991, 1999).

TABLE 4 Association with the dark triad: calculation and differences according to sex.

	Men (CI)	Women (CI)	$CI_{difference}$
MD-M	0.453 (0.320, 0.569)	0.308 (0.217, 0.394)	−0.014, 0.292
MD-P	0.449 (0.315, 0.566)	0.410 (0.326, 0.488)	−0.116, 0.182
MD-N	0.265 (0.114, 0.405)	0.202 (0.107, 0.294)	−0.114, 0.232

MD, moral disengagement; M, Machiavellianism; P, Psychopathy; N, Narcissism.

In the case of men, the misspecification potential analysis suggests that the residuals that should be associated are those of item 3 [*Considerando las formas descaradas en que las personas falsifican su información, no es pecado inflar un poco tus credenciales* (*Considering the ways people grossly misrepresent themselves, it's hardly a sin to inflate your own credentials a bit.*)] and item 4 [*Las personas no deberían ser responsables por hacer cosas cuestionables cuando solo estaban haciendo lo que una autoridad les ordenó* (*People shouldn't be held accountable for doing questionable things when they were just doing what an authority figure told them to do.*)], which corresponds to MD mechanisms advantageous comparison and displacement of responsibility, respectively, since both mechanisms promote cognitive distortion of behaviors that are reprehensible and that fall under the responsibility of the agent executing such behavior (Bandura, 1990, 1991, 1999). Furthermore, it is suggested to associate the residuals of item 6 [*Llevarse el crédito por ideas que no son tuyas, no es gran cosa* (*Taking personal credit for ideas that were not your own is no big deal.*)] and item 8 [*Las personas que son maltratadas, por lo general, han hecho algo para provocarlo* (*People who get mistreated have usually done something to bring it on themselves*)], which corresponds to MD mechanisms distortion of consequences and attribution of blame, since these mechanisms seek to avoid self-censorship by distorting the causes and consequences of immoral actions. On the one hand, the mechanisms attribute the responsibility for the immoral act's origin to the victim itself, and on the other hand, they minimize its consequences (Bandura, 1990, 1991, 1999).

TABLE 5 Reliability of the Propensity to Morally Disengage Scale: calculation and differences according to sex.

	Alpha(CI)			Omega(CI)		
	Men	Women	CI_{diff}	Men	Women	CI_{diff}
DM	0.856 (0.817, 0.866)	0.795 (0.762, 0.823)	0.013, 0.106	0.898 (0.871, 0.920)	0.869 (0.848, 0.887)	−0.004, 0.059

DM, moral disengagement; CI_{diff}, confidence interval of the difference.

The residuals' association can be related to factors that are external to the item's substantive content, such as the writing and numerical proximity within the questionnaire. Nevertheless, in this study, the potential associations among residuals, even if they are not directly related to the common variance (corresponding to the MD construct), could be related to the similarity of the specificity of each of the involved items. This would be consistent with Bandura's theory when it is stated that moral disengagement is a multifaceted and not a multifactorial construct (Bandura et al., 1996).

Two sources of information stand out when it comes to measurement invariance according to sex. In the first place, fit indices support the configural and weak invariance, but they do not support strong invariance. Therefore, even if the unidimensional structure and the construct representativeness are equivalent regarding factor loadings, DM has a different measurement scale in men and women, and the scores could not be compared. Second, the effect's measurement dimensions support the foregoing since there is no equivalence in the factor loading of item 2 (euphemistic labeling), as well as in a significant number of thresholds of six items and two residuals.

These findings are explained due to the relevance of the items to measure MD, and the moral values implied in their contents are weighted differently for the men and women under evaluation. Therefore, the Propensity to Morally Disengage Scale measures MD differently in each group. According to Bandura (2002), these differences can be attributed to the role society plays in assigning gender, since MD makes no difference in sex over the first years of life, but with time, boys become more vulnerable to morally disassociate compared to girls. Indeed, from the theory of social cognitive learning, it can be expected that the meaning and relevance of the items that measure DM are different for men and women if it is considered that this is related to the expectations of results of moral actions, which in turn, depend on social learning experiences that tend to be different for men and women (Bandura, 1986). These experiences include personal history of rewards and punishments received for moral behavior, observation of the consequences that other people receive for moral behavior, and verbal instructions about moral aspects that boys and girls receive in interactions with socialization agents. For that matter, even if the resulting means of the items in the groups of men and women show that men present higher scores than women in the Propensity to Morally Disengage Scale items (Bandura, 2002; Obermann, 2011; De Caroli and Sagone, 2014; Wang et al., 2017), it is known that the measurement invariance according to sex has not been previously evaluated in such studies, in a way that guarantees that there is no bias and that the differences in the findings could be analyzed in depth. Due to this lack of evidence and given the underlying possibility that there is a measurement bias inherent to a construct that depends greatly on the social context, it would be advisable to be cautious when considering those results. Even though the limited background in this field prevents from reaching firm conclusions, the findings obtained seem to match those studies that analyzed constructs of moral nature and that could not prove the weak, strong, or strict invariance according to sex (Grigoraş et al., 2020; Bretl and Goering, 2022; Nilsson, 2022).

Regarding the evidence of validity due to its relationship with other variables, positive correlations were found between the Propensity to Morally Disengage Scale and the dark triad dimensions (psychopathy, Machiavellianism, and narcissism) in both the groups of men and women. This is consistent with the current scientific literature that demonstrated the direct association of MD with the personality dark triad in different contexts (Sijtsema et al., 2019; Kapoor et al., 2021; Qiao et al., 2021; Brugués and Caparrós, 2022; Navas et al., 2022a,b; Yanuari, 2022), including the original study of Propensity to Morally Disengage Scale (Moore et al., 2012). Additionally, while it was postulated, based on previous literature, that this association is likely to differ between men and women, the absence of differences would reflect the complexity of the DM construct in that, regardless of whether it is assessed differently for men and women, its association with Dark Triad traits remains significant.

However, regarding reliability, coefficients α and ω reached adequate values in the group of men and women. However, the measurement seems to be more robust in men since the measurement error tolerated at the construct level (coefficient ω) and scores (coefficient α) remained constant in this group, while the women's group showed an increase in the measurement error in the coefficient α. Therefore, it is implied that the Propensity to Morally Disengage Scale is a reliable instrument, just as the study of Moore et al. (2012) has proven, although it is more consistent in men.

The practical implications of this study are mainly related to the fact that a brief and easy to use measurement instrument was provided, and it can be implemented as a unidimensional way of measuring MD among Peruvian university students. As such, it is possible to implement the instrument in the educational context to prevent and address different moral problems, such as dishonest behaviors in academic environments (e.g., plagiarism) or harassment among students. Additionally, using the Propensity to Morally Disengage Scale in the research context will help broaden knowledge and understanding the characteristics, predictors, and consequences of MD in order to create explanatory models appropriate for each context.

The findings' interpretation should take into consideration some limitations. The first limitation is the non-probabilistic nature of the sampling used, which restricts the generalization of the results. Second, the reliability of the Propensity to Morally Disengage Scale considered only the internal consistency perspective, so the conclusions regarding the measurement's temporary stability are pending. Third, the instruments that were

used are only self-report measures; this could create bias related to the social desirability of the participants, especially in variables linked to morality. Finally, based on the relationship with other variables, validity has only been evaluated from the perspective of convergent validity through its association with dark triad. Therefore, the evaluation of divergent validity considering variables linked to the orientation toward ethical or prosocial behaviors is still pending.

Therefore, it is concluded that the Propensity to Morally Disengage Scale is a unidimensional measurement that shows acceptable psychometric evidence (robust internal structure, adequate reliability coefficients, and coherent theoretical association with the dark triad) in men and women separately. However, given that one of the fit indices obtained in the CFA for the male group is above the expected value, the factor structure of the instrument should be further evaluated to explore the consistency of this finding.

Finally, it is recommended for future research to use samples that are representative of the Peruvian university population, and that are homogeneous in terms of gender or other relevant characteristics. Additionally, considering the findings, it is expected that future studies can replicate the invariance analysis and verify if the absence of invariance according to sex was unique for this study or if it is a steady aspect among samples. Moreover, using complementary approaches could help understand the differences in the invariance analysis of each item, like the item response theory. Thus, the items' differential performance in the group of men and women could be studied in depth from a different perspective, other than based on the classic test theory. Finally, additional psychometric properties must be explored, like the test-retest reliability, the divergent and convergent validity evidence with other psychological and social variables, and the invariance measurement according to age group or other relevant sociodemographic variables.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the Comité Evaluador de la Carrera de Psicología, Universidad San Ignacio de Loyola. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SL-H: Conceptualization, Methodology, Project administration, Writing—original draft, Writing—review and editing. SD-L: Conceptualization, Data curation, Formal analysis, Writing—original draft, Writing—review and editing. AS-B: Methodology, Writing—original draft, Writing—review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

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