

Testing the Validity of a Psychopathy Index Calculated from the Big Five Inventory

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Abstract

One alternative approach to the traditional self-report assessment of socially undesirable traits is prototypal matching, which consists of computing indices of a given trait from inventories designed for capturing broad personality dimensions. In the present study, the validity of a psychopathy index derived from a clinical portrayal constructed using the items from the Big Five Inventory (BFI) was tested. Participants were 449 students of three Brazilian states, who responded to the BFI, as well as the Dark Triad traits, the Short Dark Triad and the Dirty Dozen inventories. Positive and moderate correlations emerged between the proposed index and the scores in the Dark Triad, with the strongest relationships occurring with the psychopathy factors of each instrument, as expected. These associations were greater when controlling for acquiescent responding. The findings suggest that the index developed could provide an uncovered assessment of psychopathic traits.

Keywords: Psychological assessment, personality, Psychometrics, psychopathy.

Evidências de Validade de um Índice de Psicopatia a partir do *Big Five Inventory*

Resumo

Uma alternativa à avaliação direta via autorrelato de traços indesejáveis socialmente é o *prototypal matching*, que consiste em calcular um índice de um dado traço a partir de inventários de domínios amplos da personalidade. No presente estudo, testou-se a validade de um índice de psicopatia derivado de um perfil prototípico elaborado a partir dos itens do *Big Five Inventory*. Participaram do estudo 449 universitários, de três estados brasileiros, que responderam ao *Big Five Inventory* e a dois instrumentos avaliativos da tríade sombria da personalidade, *Short Dark Triad* e *Dirty Dozen*. Foram observadas correlações positivas e moderadas entre o índice e os escores na tríade sombria da personalidade, ocorrendo as correlações mais altas para os fatores de psicopatia de cada instrumento, como hipotetizado. Essas correlações se mostraram ainda mais expressivas quando controlado o efeito do viés da aquiescência. Os achados sugerem que o índice possibilita uma avaliação encoberta de traços de psicopatia.

Palavras-chave: Avaliação psicológica, personalidade, Psicometria, psicopatia.

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Evidencias de Validez de un Índice de Psicopatía a partir del Big Five Inventory

Resumen

Una alternativa para la evaluación directa de rasgos socialmente indeseables por medio del autoinforme es el *prototypal matching*, que consiste en calcular el índice de un determinado rasgo a partir de inventarios de dominios amplios de la personalidad. En este estudio se examinó la validez de índice de psicopatía derivado de un perfil prototípico elaborado con base en los ítems del *Big Five Inventory*. Participaron del estudio 449 estudiantes, de tres estados brasilenos, universitarios que respondieron al *Big Five Inventory* y a dos instrumentos evaluativos de la tríada sombría de la personalidad, el *Short Dark Triad* y el *Dirty Dozen*. Fueron observadas correlaciones positivas y moderadas entre el índice y las puntuaciones en la tríada sombría, siendo que las correlaciones más altas fueron para los factores de psicopatía de cada instrumento, como se previa en las hipótesis. Además, esas correlaciones se mostraron más expresivas cuando se controló el efecto del sesgo de aquiescencia. Los hallazgos sugieren que el índice permite una evaluación encubierta del rasgo de psicopatía.

Palabras clave: Evaluación psicológica, personalidad, Psicometría, psicopatía.

Psychopathy refers to a constellation of personality traits that includes arrogance, callousness, egocentricity, interpersonal exploitation, impulsivity and a propensity toward deviant behavior (Cooke & Michie, 2001; Fowles & Dindo, 2006; Miller & Lynam, 2015; Patrick, Fowles, & Krueger, 2009; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). Unsurprisingly, all these features tend to be socially undesirable, therefore assessing them using the self-report method poses a challenge to researchers and practitioners (Miller & Lynam, 2003; Ray et al., 2013). In some testing situations particularly (e.g., a job interview), items with a content that is explicitly negatively evaluated or pejorative might elicit socially desirable responding, that is, responses that are consistent with social or contextual expectations (Paulhus, 1991). The present study describes a tentative solution to this problem, an uncovered method for assessing psychopathy that consists of an index constructed from a broader personality inventory, the Big Five Inventory (Benet-Martínez & John, 1998).

Recent investigations have highlighted psychopathy as a continuous, non-categorical latent entity (Walters, Brinkley, Magaletta, & Diamond, 2008; Walters, Duncan, & Mitchell-Perez, 2007; Walters, Ermer, Knight, & Kiehl, 2015; Walters, Gray, et al., 2007;

Walters, Marcus, Edens, Knight, & Sanford, 201). Accordingly, rather than occurring in a discrete class of individuals, psychopathy more likely results from the extreme phenotypic manifestation of traits that are common to the entire population of individuals (Hauck-Filho, Teixeira, & Dias, 2012; Lynam & Miller, 2015). For instance, from the Big Five perspective (Costa & McCrae, 1992), psychopathy might be described as a particular profile of low scores in both agreeableness (i.e., manipulation, egocentricity, antagonism, arrogance, and lack of empathy) and conscientiousness (i.e., recklessness, disorganization, lack of purpose, and distraction; Lynam & Miller, 2015; Miller & Lynam, 2015; O'Boyle, Forsyth, Banks, Story, & White, 2014). It should be noted that low agreeableness represents a core element shared with other closely related pathological traits, such as narcissism (i.e., a tendency toward grandiosity) and Machiavellianism (i.e., a propensity toward manipulation; O'Boyle et al., 2014). Because of this similarity, psychopathy, narcissism and Machiavellianism have been often called the "Dark Triad of personality" (Paulhus & Williams, 2002).

The dimensional nature of psychopathy has inspired the development of several self-report inventories aimed at capturing the phenomenon

in the general population (cf. Lilienfeld & Fowler, 2006). The self-report assessment of psychopathy has made many advances in the field possible and, paralleling other methods that rely on clinical judgments, has allowed even subtle features of the neuropsychological functioning of psychopathic individuals to be captured (e.g., Zeier & Newman, 2013). Also supporting the use of self-reports in the assessment of the construct, a recent meta-analysis found a quasi-null relationship between self-reported psychopathy and social desirability (Ray et al., 2013). However, a correlation between self-reported psychopathy and social desirability might still exist when considering only data collected under high stakes testing situations, where test takers are motivated to consistently perform as expected. For instance, a job interview tends to elicit socially desirable responding more than the standard anonymous assessments conducted in studies in the field of psychology (Tracey, 2016). In these high stakes contexts, uncovered or indirect methods are recommended, as they can provide psychometric information about the test takers while potentially hiding (or at least making it difficult to know) the real purpose of the assessment.

Following this rationale, Miller and Lynam (2003) and Miller, Lynam, Widiger, and Leukefeld (2001) developed a psychopathy index calculated from the scores of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992). This index was developed through an approach known as “prototypal matching” (Miller, 2012). The idea of prototypal matching is to calculate how close (i.e., correlated) an individual’s pattern of scores in the items of a given instrument are to a theoretically derived profile of expected scores for a condition or trait level. In the study by Miller et al. (2001), the authors first had clinical psychologists and other experts construct a psychopathy profile using the items of the NEO-PI-R. For this, they asked the experts to indicate, for each NEO-PI-R item, the score that would best represent the response of a typical psychopath. The mean of the experts’ ratings defined the psychopathy profile against

which the scores of a given individual can be compared in order to estimate the person’s level of psychopathy. Next, the authors applied the NEO-PI-R with a community sample of adults, along with other self-report measures of psychopathy with many associated variables. Thus, the psychopathy index consisted of the correlation (the “match”) of each individual’s pattern of responses to the theoretical profile of scores constructed by the experts. As hypothesized, this index correlated positively with the other psychopathy scores, as well as with measures of aggressive and antisocial behaviors, Antisocial Personality Disorder symptoms, risky sexual behaviors, substance use, and delay discounting (Miller & Lynam, 2003; Miller et al., 2001).

The prototypal matching approach of Miller et al. (2001) for assessing psychopathic traits has many advantages. As the NEO-PI-R items are relatively less socially undesirable than those of the traditional self-report inventories of psychopathy, indexes computed using the NEO-PI-R items are expected to be less affected by socially desirable responding. Another advantage is that psychopathy scores can be calculated from any database containing the NEO-PI-R items. This means that the testing of new hypotheses regarding psychopathy become possible using personality data originally collected with no interest in psychopathy. Another benefit that should be mentioned is the possibility of collecting information on psychopathy with no need to include a questionnaire other than the NEO-PI-R in personality studies (Miller & Lynam, 2003).

However, the index developed by Miller and colleagues requires participants to answer the entire NEO-PI-R, a personality inventory containing 240 items. Therefore, this strategy drastically limits the number of other questionnaires and scales that can be included to cover additional variables of interest in standard research situations. Evidence suggests that long questionnaires tend to cause fatigue in respondents, which might increase the occurrence of missing data (Rolstad, Adler, & Rydén, 2011). Accordingly, a further step to the work initiated by Miller and colleagues would be the develop-

ment of a similar psychopathy index that could be computed from the scores in a briefer Five-Factor model inventory.

The Big Five Inventory (BFI; Benet-Martínez & John, 1998) is one of the most widely used self-report questionnaires for the broad assessment of personality traits. Investigating its psychometric properties, one study found support for the BFI five-factor structure across 56 nations (Schmitt, Allik, McCrae, & Benet-Martínez, 2007). Although not exactly brief, the BFI contains 44 items (versus 240 in the NEO-PI) that consist of brief statements, which can therefore be added to research protocols with other scales and questionnaires. Accordingly, in the present study, an index of psychopathy was developed to be calculated from the scores in the 44 BFI items, paralleling the previous work of Miller and colleagues using the NEO-PI-R (Miller & Lynam, 2003; Miller et al., 2001). For testing the validity of this new psychopathy index, it was correlated to scores in the Short Dark Triad (SDT; Jones & Paulhus, 2014) and the Dirty Dozen (DD; Jonason & Webster, 2010) scales, which assess psychopathy and two other related variables, narcissism and Machiavellianism.

The index was expected to correlate with the other scales (SDT and DD), with a hypothesis also established concerning the discriminant validity of the index. More specifically, it was expected that greater correlations would be found with the scores in the psychopathy factors of both the SDT and the DD compared to correlations with the narcissism and Machiavellianism factors. In addition, mean differences in the index were also tested according to sex, as the psychopathic phenotype tends to be more prevalent in men when compared to women (Dolan & Völlm, 2009).

Another issue that should be mentioned is that the self-report of personality traits might suffer from acquiescent/disacquiescent responding, i.e., the tendency to agree/disagree with items irrespective of their descriptive content (Soto, John, Gosling, & Potter, 2008). Considering this, the external correlations of the BFI psychopathy index were explored after

controlling for acquiescence in the SDT and DD items. The reason these additional analyses were performed was that acquiescence/disacquiescence might act as a suppressor variable, attenuating the validity coefficients.

Method

Participants

A total of 449 individuals participated, 64% female, with a mean age of 23.47 years ($SD = 6.76$). The sample was comprised of students from universities of three Brazilian states, São Paulo (41%), Minas Gerais (36%), and Santa Catarina (22%). The overall sample was diverse in terms of the undergraduate courses that the students were attending (11 courses), including mainly Psychology (52.4%), Social Communication (17.8%), and Physical Education (17.5%). Regarding monthly income, 50.2% reported receiving from one to five minimum salaries. The majority of the participants declared themselves to be white (66.2%) and single (51.3%).

Instruments

Big Five Inventory (Benet-Martínez & John, 1998). The BFI contains 44 self-report items that assess the domains of the Big Five model: extraversion, agreeableness, conscientiousness, neuroticism, and openness (McCrae & John, 1992). The factor structure of the instrument has been replicated across several cultures and languages (Schmitt et al., 2007). Benet-Martínez and John (1998) found internal consistency estimates for the five scales ranging from .66 to .89. Each item is rated on a five-point, Likert-type scale, 1 = *strongly disagree*, 5 = *strongly agree*.

Dirty Dozen (DD; Jonason & Webster, 2010). The DD is a brief, 12-item inventory that assesses the Dark Triad traits, namely, psychopathy, narcissism, and Machiavellianism. Jonason and Webster (2010) found internal consistency estimates for the scales ranging from .62 to .87. Each item is rated on a five-point, Likert-type scale, 1 = *strongly disagree*, 5 = *strongly agree*.

Short Dark Triad (SDT; Jones & Paulhus, 2014). The SDT also assesses the Dark Triad

traits, containing 27 self-report items. This inventory has been developed to provide a more comprehensive assessment of the Dark Triad traits than the DD, which only contains four items per dimension. Internal consistency estimates reported by Jones and Paulhus (2014) range from .71 to .77. Items are rated using a five-point Likert-type scale, 1 = *strongly disagree*, 5 = *strongly agree*.

Procedures

The first step in this study was to develop a profile of expected scores for a typical psychopath in the items of the BFI. The final psychopathy index consists solely of the correlation between an individual's item responses to the BFI items and this theoretical profile of expected scores in the same items. In other words, the index represents the similarity or proximity of an individual's scores to the developed profile. For this, five researchers with experience in the assessment of psychopathy and personality disorders were asked to indicate what score, in each BFI item, would best represent the response of a typical psychopath. The specialists were explicitly instructed to give item scores considering a classical psychopath, instead of providing information about their own personality. Data collection was carried out online via Survey Monkey.

Table 1 presents the information for each item considering the mean scores of the experts. This vector of item means consists of the scores in each item that a typical psychopath would be expected to achieve. Overall, the experts succeeded in creating a portrait consistent with studies that addressed the relationship between psychopathy and the Big Five (Miller & Lynam, 2015; Miller et al., 2001; O'Boyle et al., 2014), as the mean scores were particularly low for items with content related to the agreeableness and conscientiousness factors. These results reveal a prototypical profile of psychopathy in the BFI items. The index of psychopathy would be simply the correlation between an individual's scores in the BFI items and the expected scores available in Table 1.

The second step was testing the validity of the new psychopathy index with an independent

sample of students. The data collection took place in classrooms of the three universities and was conducted collectively using standard paper-and-pencil procedures. The research project was previously evaluated by an Institutional Review Board, and all participants were required to sign a consent form prior to enrollment in the study. The BFI was presented first, followed by the DD, the SDT and then some demographic questions. Participants took approximately 40 minutes on average to complete the study questionnaires.

Data Analysis

Pearson's correlation coefficient was used to estimate, for each participant in the sample, the correspondence of their scores with the profile of expected BFI scores presented in Table 1. The closer (i.e., the more positively correlated) an individual's item scores were to the values displayed in Table 1, the more psychopathic that he or she was. High scores in psychopathy will occur in the form of high positive correlations to the profile developed, whereas low scores correspond to high negative correlations, which creates a distribution ranging from -1 to +1.

After some initial exploratory analyses of the data collected, the decision was taken to compute the psychopathy index using only the BFI items from the factors that are more theoretically relevant for the definition of psychopathy. More specifically, the items that relate to the characteristics of agreeableness and conscientiousness (O'Boyle et al., 2014) were selected, although some items of low neuroticism and low openness were also included. The final selection consisted of the following BFI items: 1, 2, 3, 4, 6, 7, 8, 12, 13, 17, 18, 21, 22, 23, 24, 27, 28, 29, 31, 34, 35, 36, 37, 38, 39, 42 and 43. These items are boldfaced in Table 1, and only these should be used for calculating the index described in the present study.

Acquiescence is a bias that is typical to self-report inventories and it can attenuate or even inflate correlations between variables (Ziegler, 2015). As the criterion variables (i.e., the factors from the DD and the SDT) were collected using self-report, this was considered an issue to be further investigated. Accordingly, Struc-

Table 1
The Resulting BFI Psychopathy Profile

BFI items	Mean
1. É conversador, comunicativo.	4.33
2. Às vezes, é frio e distante.	5.00
3. <i>Tende a ser crítico com os outros.</i>	4.89
4. É minucioso, detalhista no trabalho.	2.89
5. É assertivo, não teme expressar o que sente.	2.89
6. <i>Insiste até concluir a tarefa ou o trabalho.</i>	2.33
7. É depressivo, triste.	1.33
8. <i>Gosta de cooperar com os outros.</i>	1.56
9. É original, tem sempre novas ideias.	3.11
10. É temperamental, muda de humor facilmente.	3.56
11. É inventivo, criativo.	2.56
12. É reservado.	2.22
13. <i>Valoriza o artístico, o estético.</i>	1.67
14. É emocionalmente estável, não se altera facilmente.	1.78
15. É prestativo e ajuda os outros.	1.44
16. Às vezes, é tímido e inibido.	1.33
17. <i>Pode ser um tanto descuidado.</i>	3.67
18. É amável, tem consideração com os outros.	2.56
19. <i>Tende a ser preguiçoso.</i>	2.89
20. <i>Faz as coisas com eficiência.</i>	2.67
21. É relaxado, controla bem o estresse.	3.89
22. É facilmente distraído.	3.33
23. <i>Mantém-se calmo nas situações tensas.</i>	3.89
24. <i>Prefere trabalho rotineiro.</i>	1.89
25. É curioso sobre muitas coisas rotineiras.	2.89
26. É sociável, extrovertido.	3.11
27. <i>Em geral, confia nas pessoas.</i>	1.00
28. Às vezes, é rude (grosseiro) com os outros.	4.56
29. É cheio de energia.	3.78
30. <i>Começa discussões com os outros.</i>	4.56
31. É um trabalhador de confiança.	1.67
32. <i>Faz planos e os segue à risca.</i>	2.33
33. <i>Tem uma imaginação fértil.</i>	2.78
34. <i>Fica tenso com frequência.</i>	2.56
35. É engenhoso, alguém que gosta de analisar profundamente as coisas.	2.44
36. Fica nervoso facilmente.	3.44

37. Gera muito entusiasmo	3.11
38. Tende a ser desorganizado	2.89
39. Gosta de refletir, brincar com as ideias.	2.00
40. Tem capacidade de perdoar, perdoa fácil.	1.33
41. Preocupa-se muito com tudo.	1.89
42. Tende a ser quieto, calado.	2.11
43. Tem poucos interesses artísticos.	3.56
44. É sofisticado em arte, música ou literatura.	2.33

Note. Items selected for calculating the BFI psychopathy index are boldfaced. The Brazilian Portuguese items are presented in the same order as the original English version.

tural Equation Modeling (SEM) was used to more accurately inspect the correlation between the BFI index of psychopathy and each of the factors from the DD and SDT instruments. The type of modeling used was Multiple Indicators Multiple Causes (MIMIC; Muthén, 1989), using the Mean and Variance-adjusted Weighted Least Squares estimation of the model parameters. In the MIMIC model, in addition to receiving the influence of a latent variable (e.g., psychopathy, narcissism or Machiavellianism), each item was also specified to be explained by a variable that captures the tendency for acquiescent/disacquiescent responding, as shown in Figure 1. The inclusion of this acquiescence variable in the model helped to remove spurious systematic

variance, allowing a better estimation of the correlation between the BFI psychopathy index and the variables selected for external validation. Two MIMIC models were tested, one for each Dark Triad instrument, as a source of the external validation of the index.

The strategy for composing the variable to capture acquiescence/disacquiescence followed the procedure described in the study by Soto et al. (2008). First, the researcher needs to find item pairs that are opposed in descriptive content. If the items are perfectly opposed, their mean should be “3” if they are rated on a five-point Likert scale. Individuals with a mean that deviates from this expected value might have responded under the influence of acquiescence/

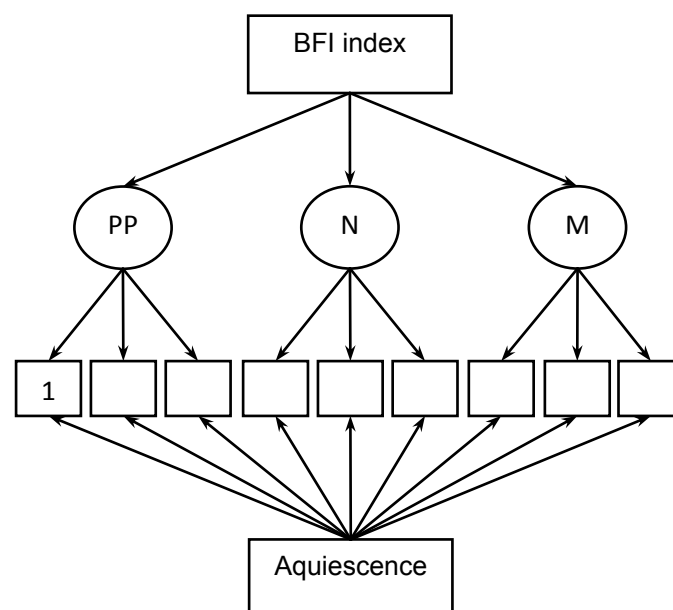


Figure 1. MIMIC model for the control of acquiescence/disacquiescence.

Note. P = psychopathy, N = narcissism and M = Machiavellianism.

disacquiescence. For instance, if someone gives a “2” (i.e., “disagree”) to the item “I am an extraverted person,” he or she should give a “4” (i.e., “agree”) to the item “I am an introverted person,” and vice-versa. In this case and all others, consistent responses to opposed items will always converge to 3. However, if the observed mean is lower than 3, then the individual tended to disagree irrespective of the item content, whereas, if the observed mean is higher than 3, then the participant tended to agree with items irrespective of their content. In the present study, the acquiescence/disacquiescence variable was calculated through the mean of the following SDT items: 11, 13, 14, 17, 20, 22, 25, and 26. As expected, the empirical mean of these items was exactly 3 ($SD = .43$), with this being specified as

a covariate item in the MIMIC model, as shown in Figure 1.

Results

Initially, the linear relationships between the BFI psychopathy index and the factors from the DD and SDT instruments were investigated. With the exception of one coefficient, as hypothesized, positive correlations were found, which supports the convergent validity of the index, as shown in Table 2. Also, in agreement with the discriminant validity hypothesis, correlations were more expressive for the psychopathy factor of the DD, and even stronger for a sum variable consisting of all psychopathy items of both the DD and the SDT ($r = .59$).

Table 2
Bivariate Correlations between the Index and the Dark Triad Factors

	<i>r</i>
DD	
Machiavellianism	.40*
Psychopathy	.47*
Narcissism	.16
DD Total	.41*
SDT	
Machiavellianism	.39*
Psychopathy	.38*
Narcissism	-.04
SDT Total	.35*
DD total + SDT total	.43*
Psychopathy DD + Psychopathy SDT	.59*

* $p < .01$.

In the next step, the MIMIC models (one using the SDT and the other using the DD) were tested, aiming to better estimate the convergent validity of the BIF psychopathy index by controlling for acquiescence/disacquiescence. A very modest approximate fit to the data was found for the model using the SDT, $\chi^2(298) = 775.95$, $RMSEA = .060$, $CFI = .911$, $TLI = .878$, and a very reasonable fit to the data when using

the DD, $\chi^2(34) = 225.26$, $RMSEA = .096$, $CFI = .988$, $TLI = .975$. The validity coefficients (standardized or beta coefficients) for the regression of each of the factors from both instruments with the BFI psychopathy index are reported in Table 3. As can be seen, the relationships were stronger than those of the previous Pearson's correlation coefficients. It should be mentioned that the control of acquiescence/disacquiescence produced

stronger support for the discriminant validity of the index. As expected, the index was more strongly associated with the psychopathy factors from the DD and the SDT when compared to the narcissism and Machiavellianism factors. When controlling for measurement error and acquiescence/disacquiescence in the MIMIC model,

the linear relationship with the DD psychopathy factor was .57 (compared to .47 in the bivariate analysis) and .49 for the SDT (compared to .38 in the bivariate analysis). These results suggest a potential suppressor effect of acquiescent/disacquiescent responding on the validity coefficients.

Table 3
Linear Relationships between the BFI Psycho-pathology Index and the Dark Triad Factors after Controlling for Acquiescence/Disacquiescence (MIMIC)

	β
DD-12	
BFI psychopathy index → Machiavellianism	.40*
BFI psychopathy index → Narcissism	.23*
BFI psychopathy index → Psychopathy	.57*
SDT	
BFI psychopathy index → Machiavellianism	.32*
BFI psychopathy index → Narcissism	-.14
BFI psychopathy index → Psychopathy	.49*

* $p < .05$.

As an additional analysis, sex differences were tested for in the BFI psychopathy index, as men tend to score higher than women in psychopathy inventories (Dolan & Völlm, 2009) antisocial personality disorder (ASPD). In this case, it was hypothesized that on average men would have a pattern of item responses closer to the BFI psychopathy profile when compared to women. Supporting this prediction, moderate mean differences were found between the sexes, $t(449) = 3.90, p < .001, d = .39$. Specifically, the mean correlation of scores to the BFI psychopathy profile was -0.25 for the women and -0.14 for the men. Thus, the participants tended to score low in the BFI psychopathy index (which is reasonable, considering they were undergraduate students), however, the women tended to score even lower than the men.

Discussion

The present study describes the development of a psychopathy index to be calculated

from scores in the BFI items. The validity of the BFI psychopathy index was tested by correlating it with the factors from the Dirty Dozen (DD) and the Short Dark Triad (SDT) inventories, and by comparing the observed scores for the men and women. Positive and moderate correlations were found between the BFI index and the factors from the two inventories (except narcissism from the SDT). Although the correlations were dissimilar when comparing the DD and the SDT, the associations were stronger for the psychopathy factors, as hypothesized, especially in the multivariate analysis using the MIMIC model. Therefore, the findings are in line with the studies carried out by Miller et al. in the development and validation of their NEO-PI-R psychopathy index (Miller & Lynam, 2003; Miller et al., 2001). Furthermore, a mean comparison revealed, as predicted, that men scored higher (i.e., closer to the BFI psychopathy profile) than women in the BFI psychopathy index. This particular finding confirms the widely reported tendency for men to manifest the psychopathy

phenotype more than women (Dolan & Völlm, 2009) antisocial personality disorder (ASPD). These results support the validity of the BFI psychopathy index as an uncovered measure of the psychopathic personality in studies using Brazilian samples – and possibly samples from other cultures as well.

In addition to investigating the validity of the new psychopathy index, this study also produced another finding that should be mentioned. When contrasting the results from tables 2 and 3, it can be seen that the simple bivariate analyses underestimated the convergent validity coefficients of the BFI psychopathy index. The linear relationships based on Pearson's coefficients, compared to the MIMIC analysis, were not only weaker but the differential correlations with the factors of narcissism and Machiavellianism were also less clear. Furthermore, the absence of a control for measurement error and acquiescent/disacquiescent responding underestimated the validity of the BFI psychopathy index. This finding highlights the need for controlling spurious (unsystematic and systematic) variance when assessing factors from the Dark Triad traits through self-report. Despite concerns having been raised regarding the detrimental impact of response styles on the quality of data collected using self-reports (Bäckström & Björklund, 2013, 2016; Möttus et al., 2012; Ziegler & Buehner, 2009), this matter has rarely motivated changes in the way psychopathy is measured and how the resulting data are analyzed in typical investigations in the field. The present study illustrates how idiosyncratic usages of the response scale by participants might bias the statistical analysis and obscure the testing of the psychological hypotheses. By including a variable that captures acquiescence/disacquiescence in the analyses it was possible to find stronger and clearer relationships between the BFI psychopathy index and the external variables collected.

Computing the BFI psychopathy index in other databases is quite simple. The whole procedure only requires the 27 items boldfaced in Table 1, and can be applied with any dataset con-

taining the responses of a sample of individuals (or even only one individual) that provided responses to these BFI items. First, the researcher must have two pieces of information: (1) the vector of 27 item means reported in Table 1, and (2) the dataset that contains the responses of the participants to the BFI items. If using the R software, each object will exist as a distinct data frame. Next, the researcher must calculate, for each individual in data frame (2), the correlation between responses to the 27 target BFI items and the vector of item means from data frame (1). This correlation should be saved as individual scores that will reflect the similarity between each participant's responses and the BFI psychopathy profile. The BFI psychopathy index will be distributed ranging from -1 , a score that indicates an extremely agreeable, kind, altruistic and responsible individual, to $+1$, a score that indicates an extremely egocentric, manipulative, callous and impulsive person —that is, highly psychopathic. Given the continuous nature of the variable, no cutoff is recommended for separating a “psychopathic” group, even though this possibility might be further investigated in future studies. The entire procedure only requires three lines of command to be executed in R, which can be obtained upon request from the second author of this study.

It should be emphasized that the rationale described here could be applied for the construction of indices of many other psychological variables. The prototypical matching approach has several still unexplored applications in the field of psychological assessment in Brazil. Despite being underused by Brazilian researchers, the technique described here has been applied to provide solutions in the field of psychological assessment since the 1990s (cf. Miller, 2012, for a review). It would be possible to construct indices for all personality disorders using prototypical matching, with the possibility of extending this to every single variable that can be mapped in the Big Five framework. The cornerstone of this procedure is having experienced researchers and specialists create the intended profile of scores in the items of a given instrument. As the BFI is one of the

most widely used inventories for the assessment of the Big Five factors, many researchers could benefit from the development of other indices computed from the items of this instrument.

The present study has one main limitation. Although the BFI does not contain items with extremely evaluative wording (i.e., items with content that is “too good” or “too bad”), its items are not free of social desirability. Evidence exists that traditional self-report inventories of personality domains also suffer from evaluative variance, as item responses might well be influenced by how desirably an item is worded (Bäckström & Björklund, 2013, 2016; Bäckström, Björklund, & Larsson, 2009). Thus, even though the BFI psychopathy index described here is probably less affected by socially desirable responding when compared to other psychopathy trait inventories, this does not imply that the evaluative variance is null. The BFI psychopathy index is recommended for research purposes, and specifically for the assessment of adults in the community, as other applications (e.g., in clinical, health and forensic contexts) still require further investigation.

Conclusion

The BFI psychopathy index provides an uncovered assessment of psychopathy, which can be calculated in all datasets containing responses to the BFI items. The index was developed using prototypal matching, a technique that has other still unexplored applications in the field of assessment in Brazil. The index reported here correlated positively with the external assessment of psychopathy and differentiated the men from the women. Hopefully, the BFI psychopathy index will help Brazilian researchers interested in the study of psychopathic traits among individuals in community contexts.

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