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Personal characteristics associated with sexuality can be classified into seven dimensions in Brazil☆

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ABSTRACT

The present study sought to map the structure of personal descriptors of sexuality in the Brazilian Portuguese language and test relationships between sexuality and the Big 5 personality traits (i.e., Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness). A selection of descriptors resulted in a list of 28 adjectives that were empirically tested to evaluate how well each descriptor could describe each participant. In the first study ($N = 331$), we found seven explanatory dimensions based on sexuality descriptors, whose content resembled those reported by Schmitt and Buss (2000). In the second study ($N = 723$), we confirmed the seven-dimension structure. These sexuality dimensions, however, presented independent constructs that were not subordinated to the Big 5 factors. The sexuality dimensions also explained variance in self-esteem beyond the Big 5 factors. Our results advance the mapping of individual differences concerning sexuality and suggest that these seven dimensions may represent features that have widespread importance to humans in many cultures. This discovery implies the possibility of developing specific tests for assessing these characteristics.

1. Introduction

Scientific discussions of individual differences in human sexual strategies have recently resumed, based on the notions of Stewart-Williams and Thomas (2013). These authors questioned the plausibility of the "men short-term, women long-term" model. The basis of this model is Trivers's (1972) differential parental investment theory, which suggests that women are more predisposed to adopt long-term sexual strategies because of the high cost of bearing children (i.e., limited production of gametes, lengthy ovulation period, time needed to generate a child, and mandatory allocation of resources to offspring). By contrast, men are predisposed to adopt short-term strategies as a function of the low cost that is associated with their descendants (i.e., high rate of gamete production, high possibility of dissemination of gametes, and paternity uncertainty; see Buss & Schmitt, 1993). In fact, this model has been used to explain gender differences in several fields (e.g. Buss, 1988, 1995; Del Giudice, 2009; Schmitt, Realo, Voracek, & Allik, 2008). Stewart-Williams and Thomas's (2013) contradiction of this generated elucidative responses from other researchers (e.g. Buss, 2013; Miller, 2013).

Stewart-Williams and Thomas (2013) proposed that human complexity cannot be explained by such a restrictive model based solely on a short-term/long-term binary construct. Instead, they asserted that individual differences that are found in sexual strategies that are used by both sexes reinforce the proposition that humans have a mixed repertoire of sexual strategies. Although this idea is not new (see Buss, 1991, 2013; Buss & Schmitt, 1993), it revives the importance of investigating individual differences in aspects of human sexuality.

Researchers have long emphasized the importance of individual differences in sexual strategies and consequently adaptive mechanisms that are related to these strategies (e.g. Buss, 1991, 2009; Gangestad & Simpson, 1990; Symons, 1979; Trivers, 1972). For example, in the early 1990s, Buss demonstrated the importance of adopting an evolutionary perspective in an area of psychology that is focused on individual differences, namely the personality arena (Buss, 1991). According to Buss (1991), individual differences in sexuality-related characteristics are central to explaining various psychological phenomena. Such differences assume paramount importance because they can explain behaviors and strategies that lead to human reproduction, including those that are related to the search, selection, and retention of partners and reproductive behavior itself (Buss, 1991).

One can see examples of consequences of individual differences in aspects of sexuality in the results of Gangestad and Simpson (1990). They suggested that variations in sexual attractiveness can explain variations in successful romantic conquest, in which high attractiveness leads to greater success. Other examples can be found in studies that reported that differences in sexual restraint are related to the formation of affective bonds, whereas sexual permissiveness is associated with greater avoidance of attachment (Penke & Asendorpf, 2008; Shiramizu, Natividade, & Lopes, 2013; Simpson & Gangestad, 1991).

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To comprehensively map the potential diversity of characteristics that are related to sexuality, Schmitt and Buss (2000) performed a study that was similar to prior studies on personality traits using a lexical hypothesis approach (e.g. Goldberg, 1992; Norman, 1963). The authors selected personal descriptors that were related to sexuality from dictionaries and books on sexuality. After applying several inclusion and exclusion criteria, the authors finalized a list of 67 adjectives and then empirically tested their structural organization.

Schmitt and Buss (2000), running a Principal Axis Factor Analysis with oblimin method of rotation, noted that the adjectives that they selected could be coherently grouped into dimensions with suitable internal consistency and evidence of construct validity. Some of the dimensions were similar to constructs that were already common in studies on sexuality, such as the previously mentioned sexual attractiveness and sexual restraint. The authors concluded that variance in sexuality descriptors can be explained by seven major dimensions: (1) Sexual Attractiveness (which corresponds to the degree of attraction that is exerted for the purpose of entering a romantic relationship; e.g., sexy), (2) Relationship Exclusivity (which indicates how willing one is to engage in exclusive romantic relationships; e.g., monogamous), (3) Gender Orientation (which refers to how one delimits others on the basis of gender roles; e.g., feminine), (4) Sexual Restraint (which describes the level of restriction of sexual practices; e.g., virginal), (5) Erotophilic Disposition (which describes one's degree of motivation to have sex; e.g., vulgar), (6) Emotional Investment (which corresponds to how willing one is to emotionally invest in a relationship; e.g., Romantic), and (7) Sexual Orientation (which describes how individuals are characterized based on Sexual Orientation; e.g., homosexual).

In addition to mapping sexuality characteristics based on English-language lexical content, Schmitt and Buss (2000) tested the relationship between their findings on sexuality and the five widely used major personality factors (i.e., the Big 5: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness; for more details, see Block, 2010; Digman, 1990; Goldberg, 1992, 1993; John, Naumann, & Soto, 2010; Hutz et al., 1998; McCrae & Costa, 1996). The authors found moderate correlations between each dimension of sexuality and at least one of the Big 5 factors, with the exception of the Neuroticism factor. For example, Sexual Attractiveness positively correlated with Extraversion. Emotional Investment positively correlated with Agreeableness. Sexual Orientation positively correlated with Openness, in sense of less heterosexual, more Openness. In addition to finding these correlations, the authors performed factorial analyses that included all of the sexuality descriptors and the Big 5 factors and concluded that the most appropriate solution was five factors. In this solution, the Big 5 traits were separated and combined with several sexuality dimensions. After conducting some tests to determine relationships between the dimensions of sexuality and the Big 5 traits (e. g. correlation tests among sexuality dimensions and Big 5 factors, multiple correlations, canonical correlation, and combined exploratory factor analyses with factors and items), the researchers concluded that the dimensions of sexuality do not explain personality as broadly as the Big 5 factors. However, the dimensions of sexuality could not be regarded as facets of any one of the Big 5 traits.

The lexical mapping that was performed by Schmitt and Buss (2000) provided a comprehensive foundation for investigating individual differences and their relationship to sexuality, similar to the initial studies that culminated in the Big 5 personality traits (John, Angleitner, & Ostendorf, 1988). Despite the potential impact of these findings, the lexical research literature shows that the results have not been replicated in other cultures. Researches mapping sexual characteristics within specific cultures, and in specific languages (lexical studies), could help to elucidate the latent factors that explain the individual differences in sexuality.

A recent search of the PsycINFO database in January 2015 revealed that the study by Schmitt and Buss (2000) had been cited in 82 other studies (21 book chapters and 61 articles). Among these articles, 17 used the Sexy Seven (i.e., an instrument that was derived from sexuality descriptors), either in its entirety or in part (Birnbaum, Mikulincer, Szepsenwol, Shaver, & Mizrahi, 2014; Bourdage, Lee, Ashton, & Perry, 2007; Herzog & Hill-Chapman, 2013; Kardum, Gračanin, & Hudek-Knežević, 2006; Rowatt & Schmitt, 2003; Schmitt, 2002, 2004a, 2004b, 2005, 2007; Schmitt & Buss, 2001; Schmitt & Jonason, 2015; Schmitt & Shackelford, 2008; Schmitt et al., 2002; Schmitt et al., 2009; Smith, Nezlek, Webster, & Paddock, 2007; Weinstein et al., 2012). Although no evidence was found that the lexical study has been conducted in other cultures (i.e., emic studies), the instrument has been used in studies that were conducted in at least 53 countries and has been translated into 26 languages, including Brazilian Portuguese (Schmitt, 2004a, 2004b, 2005, 2007; Schmitt & Shackelford, 2008; Schmitt et al., 2009).

Among the studies that used translations of the Sexy Seven, only one found evidence of the construct validity of the instrument in a country other than the United States. Kardum et al. (2006) translated the 67 adjectives from the English version of the Sexy Seven into Croatian. After conducting a factor analysis, the authors retained 54 adjectives and verified that the Emotional Investment dimension did not emerge. However, a new factor was found. Thus, Kardum et al. (2006) adopted a structure of seven dimensions of sexuality characteristics in their language, six of which were the same as those found by Schmitt and Buss (2000).

Psychological instruments that are derived from explanatory theories are challenging to translate and require careful adherence to a translation procedure to ensure representativeness of the constructs (e.g., Oliveira & Bandeira, 2011). Translations of instruments that are designed to evaluate descriptors of individual differences in the language of a specific culture can produce biased results and might be considered inconsistent with the lexical approach (Saucier & Goldberg, 1996). Therefore, the present study sought to identify descriptors of characteristics that are related to sexuality in Brazilian Portuguese, characterize their structural organization, and test their relationships with the Big 5 factors of personality.

2. Overview

This present article reports the results of two studies that were conducted consecutively. The first study was a replication of the study by Schmitt and Buss (2000) in a different cultural context. A list of adjectives that describe personal sexuality characteristics was compiled in Brazilian Portuguese. The structural organization of these adjectives and their relationships with the Big 5 factors were characterized using exploratory analysis. The second study advanced beyond exploratory analyses. The structure that was found in the first study that was based on sexuality descriptors and tests of independence of the sexuality characteristics from the Big 5 factors underwent confirmatory analysis.

3. Study 1

3.1. Method

3.1.1. Participants

A total of 331 individuals participated in the study, 65% of whom were women. The mean age was 23.3 years ($SD = 4.53$ years). No significant gender differences in age were found, $t(329) = 0.004$. The education of the participants varied from incomplete undergraduate education (73.4%) to college graduate (26.6%).

3.1.2. Instruments

Two versions (paper-and-pencil and online) of a self-administered questionnaire were used. The questionnaire included demographic questions, a list of personal sexuality descriptors, and the Factorial Battery of Personality (FBP; Nunes, Hutz, & Nunes, 2010). The list of sexuality descriptors was composed of 28 adjectives that are related

to sexuality, such as sexy, manly, vulgar, romantic, faithful, homosexual, shy, etc. The participants rated how well each adjective described them on a 7-point scale (1 = "absolutely does not describe me" to 7 = "describes me very well"). The FBP is a standardized test that was designed for the Brazilian context, similar to the NEO-PI (Costa & McCrae, 1992), which evaluates one's personality using the Big 5 factors: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. On the Brazilian test, Neuroticism and Extraversion have four sub-factors, and the remaining factors have three sub-factors, for a total of 17 facets. The test consisted of 126 items that were written as affirmative statements. The participants indicated how well each item describes them on a 7-point scale. Higher scores on each factor or sub-factor indicated a greater intensity of the latent trait. The alpha coefficients related in the manual of the FBP ranged from .74 to .89. In this present study the alpha coefficients found for FBP were .87 for Extroversion, .84 for Agreeableness, .83 for Conscientiousness, .90 for Neuroticism, and .75 for Openness.

3.1.3. Procedures

3.1.3.1. Development of the list of personal sexuality descriptors. Three data sources were used to develop the list: research findings of descriptors of personality in a Portuguese language dictionary (Pinho & Guzzo, 2003), adjectives from the study by Schmitt and Buss (2000) translated into Portuguese, and a survey about characteristics of men and women (Barros, Natividade, & Hutz, 2010). Initially, adjectives that are related to sexuality were selected by two judges from the list that was used by Pinho and Guzzo (2003). The initial selection was then augmented by translations and synonyms of the adjectives that were found in the study by Schmitt and Buss (2000) that were not present in the initial selection. Finally, adjectives from the study by Barros et al. (2010) were added to the list. Later, the two judges reviewed the list and removed items according to the following criteria: (1) items considered inappropriate for representing a trait because, in Portuguese, they better describe a state or other more momentary characteristic (e.g., falling in love and perfumed), (2) items that are considered technical terms or unusual in current usage and consequently may not be understood by the majority of laypeople (e.g., personable, wooer, gallant, masochistic, puritan, and sadomasochist), (3) items that are related to body parts (e.g., well endowed and busty), and (4) items with pejorative connotations (e.g., easy lay, shameless, and bitch). Finally, the list was presented to four students (two men and two women) to determine whether they recognized and understood the adjectives. The final list included 28 adjectives. Biform adjectives were presented with both the masculine and feminine gender inflections to avoid gender bias (c.f., Natividade, Barros, & Hutz, 2012).

3.1.3.2. Data collection. The data were collected in person and via the Internet. For the in-person data collection, participants were recruited from psychology classes at universities in southern Brazil. Of the participants, 43.8% completed the survey in person. For the Internet data collection, a link was made available to the survey in a form similar to the paper version. Participants were recruited through invitations that were sent by e-mail and through social networks that contained the link to the questionnaire. In all cases, participation in the survey was voluntary and anonymous.

3.1.3.3. Data analysis. The data were first visually inspected to exclude cases in which no response was made to any of the items in the list of sexuality characteristics. Cases that raised suspicion of distortion (e.g., identical or extreme responses on all of the items in the list of sexuality characteristics) were then excluded. Finally, items from sexuality descriptors with missing answers were replaced (0.44% of total answers) by the mean of the series. The missing responses to the FBP were not replaced because 35.3% of the participants did not provide answers to any of the 126 FBP items.

3.2. Results

To determine the structural configuration of the list of sexuality descriptors, a Principal Component Analysis was performed with Varimax rotation. Other methods of rotation were also tested, and the solutions were similar. The sampling adequacy for that analysis was assured by the Kaiser-Meyer-Olkin index (KMO = .82) by performing and Bartlett's test of sphericity, $\chi^2(378, N = 331) = 4587.3$, $p < .001$. Seven dimensions had eigenvalues > 1 and explained 69.2% of the data variance. The scree plot (Fig. 1) revealed the appropriateness of the seven-component structure. Additionally, a parallel analysis of random eigenvalues showed that the last eigenvalue that was greater than the simulated eigenvalue was the one for the seventh dimension (eighth dimension: observed eigenvalue = 0.86 and simulated eigenvalue = 1.23; parallel analysis was calculated by considering 331 cases, 28 variables, and 1000 bootstrap samples). The extraction of seven dimensions of sexuality characteristics is considered suitable according to the factor retention criteria of Kaiser (1960); Cattell (1966), and Horn (1965) as described above.

The configuration of the items in the dimensions was similar to the one found by Schmitt and Buss (2000; Table 1). The seven dimensions included Sexual Attractiveness, Gender Orientation, Erotophilic Disposition, Emotional Investment, Relationship Exclusivity, Sexual Orientation, and Sexual Restraint. Internal consistency (alpha coefficient; Cronbach, 1951) for the dimensions ranged from .92 to .60 (Table 1). Therefore, all of the dimensions were considered to have satisfactory internal consistency, with the exception of Sexual Restraint (c.f., Nunnally, 1978).

We also verified the agreement of the seven dimensions structure between women and men. We ran an Exploratory Factor Analysis with Procrustes rotation and calculated the Tucker's phi coefficient of congruence (following recommendation for personality scales from McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). The Tucker's phi coefficients of congruence are showed in Table 1. All the components showed coefficients of congruence higher than .90, excepting for two components whose coefficients were .73 and .74. The average of the congruence coefficients was .87. This result suggests a fair similarity for the structure between women and men (c.f. Lorenzo-Seva & ten Berge, 2006).

Gender differences in sexuality dimensions were tested using Student's *t*-test. Significant differences were found for five dimensions. The effect sizes are shown in the last row of Table 1. Women had higher means than men in the Sexual Attractiveness, Emotional Investment, and Relationship Exclusivity dimensions. Men scored higher in the Erotophilic Disposition and Gender Orientation dimensions. The scores

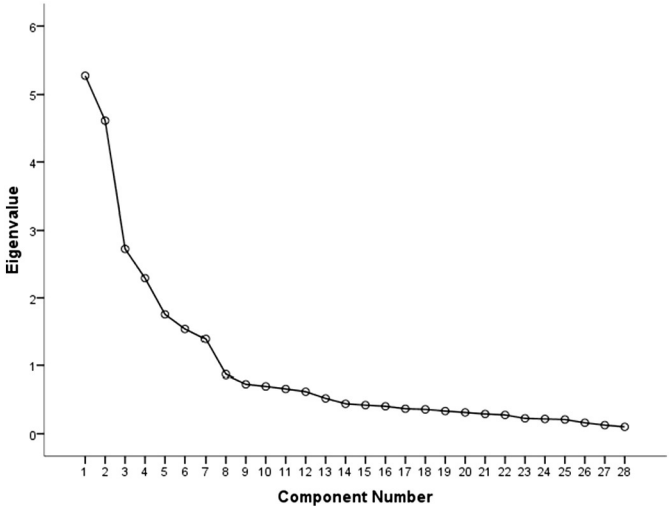

Fig. 1. Sedimentation graph of sexuality descriptors.

Table 1
Componential loadings of sexuality descriptors from a principal Component Analysis with Varimax rotation.

	Sexual Attractiveness	Gender Orientation	Erotophilic Disposition	Emotional Investment	Relationship Exclusivity	Sexual Orientation	Sexual Restraint	h^2
Sensual	**.83**	.18	.03	.19	.02	.02	−.07	.77
Arousing	**.82**	−.14	.17	.06	.08	.03	−.07	.73
Seductive	**.81**	.04	.12	.14	.09	−.09	−.10	.72
Attractive	**.79**	.11	−.05	.13	.06	−.08	.002	.67
Hot	**.78**	.14	.15	.10	−.07	.06	−.01	.67
Feminine	.10	**.91**	−.15	.12	−.13	−.02	−.02	.89
Manly	−.05	**−.91**	.14	−.06	.04	.001	.03	.85
Masculine	−.02	**−.89**	.21	−.07	.12	.04	.01	.86
Effeminate	.16	**.81**	.03	.12	−.10	.08	.03	.71
Obscene	.08	−.07	**.85**	.06	.13	.12	−.07	.77
Indecent	.15	−.09	**.80**	−.08	.09	.09	−.05	.70
Vulgar	.02	−.14	**.77**	−.10	.14	.04	−.001	.65
Perverted	.15	−.15	**.65**	.09	.16	.16	−.14	.55
Affectionate	.10	.09	−.07	**.86**	−.12	−.04	−.11	.78
Amorous	.15	.02	.001	**.82**	−.11	.04	.07	.72
Gentle	.16	.17	.01	**.81**	−.12	−.01	−.04	.73
Romantic	.26	.11	.05	**.52**	−.19	−.07	.24	.45
Unfaithful	.08	−.02	.25	−.18	**.80**	−.01	−.07	.76
Monogamous	−.04	.12	.02	.05	**−.78**	−.16	.11	.66
Polygamous	.08	−.21	.22	−.03	**.75**	.15	.08	.68
Faithful	.03	.05	−.16	.31	**−.73**	−.01	.07	.66
Homosexual	−.02	−.07	.11	−.04	.02	**.92**	.02	.87
Heterosexual	.06	.02	−.07	.03	−.09	**−.91**	.03	.85
Bisexual	.02	.14	.21	.03	.17	**.79**	−.02	.72
Immaculate	−.01	−.09	.01	.003	.03	−.01	**.69**	.48
Pure	.12	−.01	−.14	.16	−.05	.01	**.67**	.51
Virginal	−.20	.10	.03	−.001	.01	.01	**.66**	.48
Shy	−.11	−.01	−.13	−.10	−.14	−.03	**.65**	.48
Eigenvalues	5.30	4.54	2.64	2.28	1.76	1.51	1.34	
Alpha coefficient	.89	.92	.81	.81	.81	.88	.60	
M women (*SD*)	4.48 (1.14)	2.13 (0.79)	2.02 (1.03)	5.69 (0.96)	6.14 (1.08)	6.31 (1.28)	2.58 (1.11)	
M men (*SD*)	4.14 (1.10)	5.87 (0.99)	2.68 (1.29)	5.28 (0.95)	5.47 (1.24)	6.19 (1.58)	2.62 (1.02)	
Tucker's phi [§]	.73	.96	.90	.92	.90	.74	.93	
d	0.31**	−4.20***	−0.56***	0.43***	0.58***	0.09	0.03	

Note. For women, $n = 215$; for men, $n = 116$. Componential loadings larger than .40 are bolded and indicate the dimensions in which the respective items are more likely to be found. The following items were inverted to calculate the means: feminine, effeminate, unfaithful, polygamous, homosexual and bisexual. [§] Tucker's phi coefficient of congruence among components found in women and men samples (Tucker, 1951). Negative values of Cohen's *d* indicate higher means for men (Cohen, 1962).

** $p < .01$

*** $p < .001$.

for the Gender Orientation dimension were calculated so that high means represented male characteristics.

To determine the relationships among the sexuality characteristics and the Big 5 personality traits, a Principal Component Analysis with Varimax rotation was performed using the 28 items that were related to sexuality and 17 sub-factors from the FBP. The sub-factors were used rather than the 126 items from the FBP because of the small size of the sample. Moreover, many participants did not respond to the FBP and were consequently omitted from these analyses. The sampling adequacy for the analysis was demonstrated by KMO = .78 and Bartlett's test of Sphericity, $\chi^2(990, N = 214) = 4684.9$, $p < .001$. Twelve dimensions had eigenvalues greater than one (6.51, 5.73, 3.44, 2.61, 2.44, 2.13, 1.95, 1.85, 1.53, 1.43, 1.23, 1.05) and explained 70.9% of the data variance. The 12 dimensions corresponded to the Big 5 factors and seven dimensions of sexuality that were previously found. The sub-factors from the FBP could be grouped according to the factors that they represented, although some obtained loadings greater than .30 on more than one component. The sexuality characteristics could also be grouped according to the structure that was previously found.

Three additional Principal Component Analyses were performed with Varimax rotation, forcing the extraction of five components and including the following variables: (1) sexuality characteristic items and scores for the sub-factors of the FPB, (2) scores for the sexuality characteristics dimensions and sub-factors scores for the FPB, and (3) scores for the sexuality dimensions and scores for the factors of the FPB. The results of the first analysis showed a mix of items from various sexuality dimensions and sub-factors of the FPB. For example, the first component grouped items that were associated with the Sexual Attractiveness and Sexual Restraint dimensions, three Extraversion sub-factors, one Agreeableness sub-factor, and one Openness sub-factor. The second component grouped Gender Orientation items, one from the Relationship Exclusivity dimension, one Erotophilic Disposition item, and one Openness sub-factor. For the other components, no consistent pattern was found.

In the second Principal Component Analysis, the Extraversion sub-factors, one Conscientiousness sub-factor, one Openness sub-factor, and the Sexual Attractiveness and Sexual Restraint dimensions grouped in one component (eigenvalue = 4.26). The component (eigenvalue = 3.63) grouped the Neuroticism sub-factors and one Agreeableness sub-factor. The third component (eigenvalue = 2.08) grouped the Erotophilic Disposition, Gender Orientation, Sexual Orientation, and Relationship Exclusivity dimensions, two Openness sub-factors, and one Agreeableness sub-factor. Two Conscientiousness sub-factors grouped in the fourth component (eigenvalue = 1.85). The fifth component (eigenvalue = 1.50) included one Agreeableness sub-factor and the Emotional Investment dimension.

In the third Principal Component Analysis, the Neuroticism, Conscientiousness, and Agreeableness factors were grouped in a first component (eigenvalue = 2.65). The second component (eigenvalue = 1.96) included Extraversion, Sexual Attractiveness, and Sexual Restraint. The third component (eigenvalue = 1.20) consisted of Gender Orientation, Emotional Investment, and Relationship Exclusivity. The fourth component (eigenvalue = 1.03) was composed of Sexual Orientation. The fifth component (eigenvalue = 0.91) included Openness and Erotophilic Disposition.

Finally, the canonical correlation coefficient (Knapp, 1978) between the two sets of variables that were formed by the seven sexuality dimensions and Big 5 factors was estimated to be .59, which corresponds to 34.8% shared variance between the two sets of variables. Multiple correlation coefficients between each sexuality dimension and all Big 5 factors were also calculated (Table 2). Values for multiple correlations ranged from .21 (Gender Orientation) to .50 (Erotophilic Disposition), with a mean value of .34. Table 2 also presents the Pearson correlation coefficients among all of the sexuality dimensions and Big 5 factors. The strongest correlations between the sexuality dimensions and Big 5 factors occurred for Sexual Attractiveness and Extraversion, and Erotophilic Disposition and Agreeableness.

4. Study 2

4.1. Method

4.1.1. Participants

A total of 723 individuals participated, 59.8% of whom were women. The mean age of the women was 26.2 years ($SD = 8.22$ years), and the mean age of the men was 29.9 years ($SD = 8.25$ years). This age difference between women and men was significant, $t(712) = 4.21$, $p < .001$; $d = 0.32$. Education varied from incomplete undergraduate education (51.7%) to bachelor's degree (48.3%).

4.1.2. Instruments

An online self-administered questionnaire that was similar to the paper-and-pencil version was used. This questionnaire included sociodemographic questions, the list of sexuality characteristics that was developed in Study 1, a measure for assessing the Big 5 personality traits (Red5; Natividade & Hutz, 2015), and the Rosenberg self-esteem scale (Hutz & Zanon, 2011; Rosenberg, 1965). Red5 is a measure for assessing the Big 5 factors. It consists of 20 items, four for each factor. The items are adjectives that participants rate on a 7-point scale to indicate how well the adjectives describe them. In the Natividade and Hutz study the Red5 showed alpha coefficients ranging from .59 to .84, and test–retest reliability ranging from .69 to .81. In this present study the alpha coefficients for Red5 were .83 for Extroversion, .77 for Agreeableness, .70 for Conscientiousness, .65 for Neuroticism, and .53 for Openness. We choose the Red5 for the present study because the item format and theoretical perspective are similar to the Goldberg (1992) instrument that was used by Schmitt and Buss (2000). It also greatly reduces the data collection time compared with the instrument that was used in Study 1. The Rosenberg self-esteem scale was adapted and validated for use in Brazil by Hutz and Zanon. This instrument is composed of 10 items, and participants indicate how much they agree with each item. Hutz and Zanon found an alpha coefficient of .90 in their study; in the present study we found an alpha coefficient of .85. We choose assess self-esteem in this study because Schmitt and Buss also tested relationships among sexuality dimensions and self-esteem, and because self-esteem also has showed consistent relationships with Big 5 factors (see Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001). For all of the measures, higher scores corresponded to greater intensity of the latent trait.

4.1.3. Procedures

4.1.3.1. Data collection. Data collection was conducted only via the Internet in Study 2. Participants were invited by e-mail to participate. Invitations with links to the questionnaire were also made available on social networks. We also invited some of the participants to answer an identical questionnaire approximately 60 days after their first response to determine test–retest reliability.

4.1.3.2. Data analysis. We used the same procedures that were performed in Study 1 for data cleaning and the replacement of missing responses. In Study 2, 0.34% of the sexuality characteristic responses and 0.33% of the Red5 responses were missing. These few responses were replaced by means of the series.

Confirmatory Factor Analyses were conducted to test the structural adequacy of the sexuality characteristics. We also verified the models, including sexuality characteristics and the Big 5 factors. For all of these analyses we depart of the covariance matrix of data for parameter estimations, used the maximum likelihood method, and ran with the AMOS 16.0 software. Since we found a fair similarity of the structure of sexuality descriptors between women and men in the Study 1, we used total sample in these analyses.

4.2. Results

Firstly we tested the structural adequacy of the seven sexuality dimensions found in Study 1. A model with seven correlated factors that explained their respective items was specified in accordance with the structure that was found in Study 1. Table 3 shows all of the adjustment coefficients. The seven-factor model presented adjustment coefficients that, considered together, indicate that the data fit our configured structure well (c.f., Byrne, 2009; Marsh, Hau, & Wen, 2004): RMSEA < .06; CFI, TLI, and GFI > .90; NFI and AGFI equal and close to .90. Two hypothetical

Table 2
Pearson and multiple correlation coefficients among sexuality dimensions and the Big 5 factors for the Study 1 and Study 2 samples.

	1	2	3	4	5	6	7	8	9	10	11	12	R
1. Sexual Attractiveness		−.03	.20**	**.30****	−.13**	−.06	.01	−.05	.24**	.18**	.10**	.29**	**.35**
2. Gender Orientation	−.09		.12**	−.11**	−.06	.02	−.12**	.02	.04	−.06	−.05	.002	.11
3. Erotophilic Disposition	.28***	.07		−.01	**−.34****	−.23**	−.22**	.22**	.13**	−.11**	**−.30****	.21**	**.42**
4. Emotional Investment	**.33*****	−.17**	.02		.18**	.02	.09*	−.08*	.17**	**.34****	.12**	.12**	**.35**
5. Relationship Exclusivity	−.12*	−.06	**−.33*****	**.31*****		**.36****	.17**	−.09*	−.10**	.04	.16**	−.27**	**.33**
6. Sexual Orientation	.01	−.06	−.29***	.08	.28***		.09*	−.07*	.003	.04	.15**	−.22**	.27
7. Sexual Constraint	−.12*	−.05	−.20***	.05	.15**	.03		−.09*	−.28**	−.02	.11**	−.22**	**.36**
8. Neuroticism	−.10	.09	.22**	−.21**	−.21**	−.12	−.02		−.01	−.25**	−.22**	.03	
9. Extraversion	**.39*****	−.15	.17*	.17*	−.09	−.01	−.22**	−.09		**.48****	.04	.27**	
10. Agreeableness	−.05	−.09	**−.38*****	**.30*****	.24***	.21**	.09	**−.36*****	−.09		.16**	.19**	
11. Conscientiousness	.06	−.12	−.26***	.19**	.23**	.07	.15*	**−.30*****	−.02	**.35*****		−.04	
12. Openness	.16*	.04	**.31*****	.11	−.13	−.12	−.20**	.12	.23**	−.04	−.06		
R	**.41**	.21	**.50**	**.40**	**.32**	.23	**.30**						

Note. Below the main diagonal are shown the coefficients for the Study 1 sample ($N = 331$ for characteristics related to sexuality and $N = 214$ for Big 5 personality traits); above the main diagonal are shown the coefficients for the Study 2 sample ($N = 723$). R: Multiple correlation coefficients between each of the seven sexuality dimensions and all the Big 5 personality factors. Coefficients equal or higher than .30 are bolded. All of the coefficients were calculated from the standardized scores for each gender.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

models were also tested: a single-factor model and the two-factor model that was suggested by Schmitt and Buss (2000). In both cases, adjustment coefficients proved to be poor and inferior to the one that was found for the seven-factor structure.

The second set of analyses sought to determine the independence of the sexuality characteristics from the Big 5 factors. Therefore, the first models that were tested included all of the sexuality characteristics and Big 5 factor items. The 20-item instrument for assessing the Big 5 factors and 28 items that were related to sexuality, for a total of 48 items, allowed all of the items to be included in the analysis and guaranteed a rate of participants per item that was greater than 10. Four structural models were tested: a single-factor model (in which all of the items comprised a single factor), a model with two correlated factors (in which the items concerning sexuality comprised one factor and the Big 5 factor items comprised the other factor), a model with five correlated factors that were specified according to the structure that was described by Schmitt and Buss (2000), and a model with 12 correlated factors that were specified with the respective items of the seven dimensions of sexuality and five dimensions of the Big 5 factor model. The adjustment coefficients are shown in Table 3. Notably, the 12-factor model presented the best fit for the data, considering other models we tested.

Additionally, we performed Confirmatory Factor Analyses with a robust method of estimation (Satorra & Bentler, 1994). We ran this analysis for the seven-factor model for descriptors of sexuality, and for the 12-factor model with sexuality dimensions and Big 5 factors. We used the software R (R Development Core Team, 2012) and the statistical package Lavaan (Rossel, 2012). The results for the robust method were similar to those found with the Maximum Likelihood method of estimation. Though that analysis showed even better adjustment coefficients for the models (Table 3), mainly considering chi-square-degrees of freedom ratio < 3 (a low-impacted by sample size coefficient), and the RMSEA < 0.06.

The alpha coefficients (Cronbach, 1951) and test–retest correlation coefficients for each dimension were also calculated (Table 4). Taken together, these reliability coefficients showed satisfactory values (c.f. Nunnally, 1978). Effect sizes of gender differences for each dimension of sexuality are also presented in Table 4. Significant gender differences were found for five of the seven dimensions. Women scored higher than men in the Emotional Investment, Relationship Exclusivity, and Sexual Restraint dimensions. Men had higher means in the Erotophilic Disposition and Gender Orientation dimensions (high means represented male characteristics).

As in Study 1, correlations between the sets of variables that were related to sexuality and the Big 5 factors were examined. A canonical correlation coefficient (Knapp, 1978) of .52 was found, which is equivalent to 27.2% shared variance between the sets. Additionally, multiple correlation coefficients were calculated between the sexuality dimensions and all Big 5 factors. Pearson's correlation coefficients were also calculated for all of the sexuality dimensions and Big 5 factors. The results are shown above the main diagonal in Table 2.

Finally, the predictive value of sexuality characteristics in explaining the variance in a construct beyond the Big 5 factors was tested. For this purpose, a hierarchical regression analysis was performed. This analysis included self-esteem as the dependent variable and the following independent variables: step 1 (gender and age), step 2 (five main factors), and step 3 (seven dimensions of sexuality). The coefficients are shown in Table 5. One can observe that the addition of the Big 5 factors explained 25% of the variance in self-esteem, and the addition of the sexuality dimensions explained 6%. Both of these sets of variables significantly explained the self-esteem variance.

5. General discussion

The first aim of the present study was to identify and test the factorial structure of personal characteristics that are related to sexuality in the Brazilian Portuguese language, similar to the factorial structure that was reported by Schmitt and Buss (2000) for the American English language. After identifying and selecting the descriptors, a list of 28 adjectives that were related to sexuality was created. We found the same seven-dimension structure as the one reported by Schmitt and Buss in the United States context. Our structure was then tested in two different samples using exploratory and confirmatory analyses. A seven-factor solution was found to be more appropriate than alternative models that contained one or two factors. Furthermore, the factors had a similar content to those found by Schmitt and Buss. We then used the same nomenclature as these authors: Sexual Attractiveness, Gender Orientation, Erotophilic Disposition, Emotional Investment, Relationship Exclusivity, Sexual Orientation, and Sexual Restraint. Coefficients of reliability, including alpha coefficients, in both studies and the test–retest results

Table 3
Adjustment coefficients of the models tested in the Confirmatory Factor Analyses.

	Sexy seven			Sexy seven and Big 5			
	Single-factor A	Two-factor A	Seven factors	Single-factor B	Two-factor B	Five factors	12 factors
χ^2	8001.0	5859.4	1047.0 (947.4)	13,023.7	11,664.7	7451.0	2795.5 (2559.9)
df	350	345	329	1080	1079	1070	1014
p	<.001	<.001	<.001	<.001	<.001	<.001	<.001
χ^2/df	22.9	17.0	3.18 (2.88)	12.1	10.8	6.96	2.76 (2.52)
GFI	.46	.57	.90	.45	.49	.61	.85
AGFI	.37	.49	.88	.40	.44	.57	.82
NFI	.25	.45	.90	.19	.28	.54	.83
TLI	.19	.41	.92 (.92)	.17	.26	.55	.87 (.87)
CFI	.25	.46	.93 (.93)	.20	.29	.57	.88 (.89)
RMSEA	0.17	0.15	0.055 (0.051)	0.12	0.12	0.091	0.049 (0.046)
CI 90% RMSEA	0.17–0.18	0.14–0.15	0.051–0.059	0.12–0.13	0.11–0.12	0.089–0.093	0.047–0.052
CAIC	8425.6	6322.0	163.9	13,751.7	12,400.3	8254.8	4024.1

Note. $N = 723$. The numbers between parentheses are the Satorra-Bentler corrected coefficients (Satorra & Bentler, 1994). Single-factor A: model specified with a single factor explaining by all of the sexuality characteristics-related items. Two-factor A: model delineated according to the hypothesis of Schmitt and Buss (2000). It was specified with two correlated factors, one explaining Sexual Attractiveness, Sexual Orientation and Sexual Restraint and the other by Gender Orientation, Emotional Investment and Relationship Exclusivity. Both factors were explaining Erotophilic Disposition. Seven factors: model specified with seven correlated factors, each explaining their respective observable sexuality characteristics, as in the model found in Study 1 from this research. Single-factor B: model specified with a single factor explaining all of the sexuality characteristics items and by the Big 5 factors. Two-factor B: model specified with two correlated factors, one explaining the sexuality characteristics items and the other by items from the Big 5 model. Five factors: model specified according to the results of Schmitt and Buss's (2000, p. 162) exploratory analysis for determining the sexuality and Big 5 dimensions. Five factors model was specified with five correlated factors: One was explaining by the Agreeableness and Emotional Investment items; another by Sexual Attractiveness, Extraversion, Erotophilic Disposition and Sexual Restraint; another by items from Openness and Sexual Orientation; another by Neuroticism items and Gender Orientation; and another by the Conscientiousness and Relationship Exclusivity items. χ^2: Chi-square; *df*: Degrees of freedom; χ^2/df: Chi-square/Degrees of freedom ratio; GFI: Goodness-of-Fit Index; AGFI: Adjusted Goodness-of-Fit Index; NFI: Normed Fit Index; TLI: Tucker–Lewis Index; CFI: Comparative Fit Index; RMSEA: Root Mean Square Error of Approximation; CI 90% RMSEA: 90% Confidence Interval; CAIC: Consistent Akaike Information Criterion.

Table 4
Reliability coefficients, means, standard deviations and effect sizes of gender differences of the sexuality dimensions.

			Women $n = 432$		Men $n = 291$		
	Alpha coefficient	Test–retest[§]	*M*	*SD*	*M*	*SD*	*d*
Sexual Attractiveness	.90	.81	4.41	1.36	4.28	1.33	0.10
Gender Orientation	.91	.81	2.27	.96	5.91	.94	−3.84***
Erotophilic Disposition	.79	.83	2.01	1.01	2.84	1.35	−0.71***
Emotional Investment	.84	.74	5.79	1.00	5.60	1.04	0.19*
Relationship Exclusivity	.83	.91	6.20	1.04	5.66	1.42	0.43***
Sexual Orientation	.82	.86	6.27	1.30	6.06	1.62	0.14
Sexual Restraint	.71	.68	2.79	1.21	2.58	1.08	0.18*

Note. Gender differences verified using Student's *t*-test. Negative Cohen's *d* (1962) indicates higher means for men.
§ About 75 days between the first and second responses, $n = 44$.
* $p < .05$.
*** $p < .001$.

were found to be satisfactory for all of the factors, although the Sexual Restraint dimension presented marginal results.

Schmitt and his collaborators have used translated versions of the list of sexuality descriptors that they developed in the United States (i.e., the Sexy Seven instrument) in studies that were conducted in several countries (e.g. Schmitt, 2004b, 2005, 2007; Schmitt & Shackelford, 2008; Schmitt et al., 2009). Nonetheless, to our knowledge, the present study represents the first attempt to replicate Schmitt and Buss's (2000) lexical study. The adaptation of psychological instruments from one culture to another is a complex task, and special care is needed when translating instruments that contain adjectives. Even if there are correct translations for certain adjectives, their use in the original culture and another culture can be dissimilar. For example, the translation of the term "abstinent" into Portuguese results in a word that is more related to the consumption of substances than to sexual practice. Additionally, translations of such adjectives as "kinky," "crude," "indiscreet," "suggestive," and "loose" into Brazilian Portuguese would not refer to sexuality characteristics when read in isolation and decontextualized. Moreover, translations of such adjectives as "sensual," "sexy," "lustful," and "sultry" in Brazilian Portuguese can be represented by a single word. Therefore, with this study, we reinforce the importance of emic researches for delineations of psychological constructs, and emphasize the need for procedures to adapt instruments retaining the fidelity of items meanings.

Issues concerning translating the Sexy Seven instrument are not exclusive to the Brazilian Portuguese language. One example is the Croatian-translated version that was developed by Kardum et al. (2006). These authors excluded approximately 19% of the items from the factor analysis because they did not present substantial loading or loaded equally on several factors. Nevertheless, Kardum et al. replicated six of Schmitt and Buss's (2000) seven dimensions and found a dimension that was unique to the Croatian language. In Brazilian Portuguese, yet another problem is evident with adjectives that comprise the Sexy Seven; some of these adjectives are biform and have gender inflections. Consequently, the level of a person's identification with the adjective can be influenced by the gender of the adjective when it is presented to that person, as concluded by Natividade et al. (2012). Therefore, we suggest that the present study provides more accurate evidence of the dimensions of sexuality in Brazilian studies compared with other studies that used a translated version of Schmitt and Buss's instrument.

5.1. Gender differences

Gender differences in the sexuality dimensions were the same in both Study 1 and Study 2 in four dimensions: Gender Orientation, Erotophilic Disposition, Emotional Investment, and Relationship Exclusivity. These results agree with other studies that tested gender differences in sexuality dimensions (e.g. Rowatt & Schmitt, 2003; Schmitt &

Table 5
Hierarchical multiple regression analysis predicting self-esteem from the seven sexuality dimensions and five factors of personality.

	Step 1			Step 2			Step 3		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
Constant	(3.03)	32.8	<.001	(2.42)	14.5	<.001	(2.55)	9.80	<.001
Sex (masculine)	.04	1.03	.30	.03	0.90	.37	.09	1.32	.19
Age	.19	5.13	<.001	.09	2.70	.007	.07	2.23	.03
Agreeableness				.07	1.93	.05	.06	1.48	.14
Extraversion				.12	3.28	.001	.08	2.15	.03
Conscientiousness				.29	8.42	<.001	.25	7.17	<.001
Neuroticism				−.30	−8.39	<.001	−.28	−8.19	<.001
Openness				.06	1.79	.07	.02	0.47	.64
Gender Orientation							−.01	−0.16	.87
Emotional Investment							−.01	−0.42	.67
Erotophilic Disposition							−.10	−2.66	.008
Sexual Orientation							−.005	−0.15	.88
Relationship Exclusivity							.06	1.59	.11
Sexual Restraint							−.09	−2.62	.009
Sexual Attractiveness							.25	7.09	<.001
R^2		.04			.28			.34	
F		14.9***			39.7***			25.6***	
ΔR^2					.25			.06	
ΔF					47.6***			8.44***	

Note. $N = 723$. The value in parentheses corresponds to the non-standardized constant of the coefficient.
*** $p < .001$.

Buss, 2000) and reinforce previous findings on gender differences in sexual strategies (Buss & Schmitt, 1993). Women tend to score higher in dimensions that are related to long-term strategies, such as Emotional Investment and Relationship Exclusivity. By contrast, men have higher scores in the Erotophilic Disposition dimension, which is related to the short-term strategy.

Two dimensions also presented gender differences in one study but not the other: Sexual Attractiveness (gender difference in Study 1) and Sexual Restraint (gender difference in Study 2). This may have occurred because of the different mean ages between the two samples. Schmitt et al. (2002) reported differences in Sexual Attractiveness among women in several age groups. The highest scores were found among 30- to 34-year-old women. Therefore, age may have played a modulatory role in the self-evaluation of Sexual Attractiveness and Sexual Restraint in our participants. This result reinforces the importance of conducting investigations with larger samples that have greater age variations, including populations who are older than the university population. Such studies, in addition to elucidating patterns of gender differences, could investigate gender-specific patterns in the development of sexuality characteristics.

5.2. Relationships with the Big 5 traits

The relationships between the sexuality dimensions and Big 5 personality traits were tested in several ways. Moreover, two instruments were used to assess the Big 5 traits. All of our results suggested that the sexuality characteristics were independent from the Big 5 factors. For example, the results of Study 1 showed approximately 35% shared variance between the two sets of variables. In Study 2, approximately 27% shared variance was observed. These results differ from those reported by Schmitt and Buss (2000), who found approximately 80% shared variance between their two sets. This may be because Schmitt and Buss's (2000) English instrument had adjectives that might be interpreted as descriptors of personality characteristics that are not necessarily related to sexuality, whereas our Brazilian Portuguese instrument contained fewer such items. This problem of content overlap in the Sexy Seven instrument of Schmitt and Buss (2000) was also highlighted by Bourdage et al. (2007).

Multiple correlations among the Big 5 factors and each of the seven dimensions of sexuality ranged from .21 to .50 in Study 1 and from .11 to .42 in Study 2. In both studies, the lowest coefficients were found for the Gender Orientation dimension, and the highest coefficients were found for the Erotophilic Disposition dimension. Again, this result contrasted with the findings of Schmitt and Buss (2000), in which the lowest multiple correlation coefficient was .32, and the highest was .69. However, the present results were similar to those of Bourdage et al. (2007), who used an instrument to assess the Big 5 factors that presented the items as affirmative statements. Furthermore, the highest Pearson correlation coefficients between the sexuality dimensions and personality factors were less than .40. Altogether, these results support the conclusion of independence among the constructs of both sets.

We ran at least three different exploratory factor analyses of the data from the sexuality dimensions and Big 5 factors in Study 1. All of these analyses indicated that it was inappropriate to extract five factors for that set of items, even when this solution was forced. These results contradict the findings of Schmitt and Buss (2000), who concluded that the extraction of five factors for all of the Big 5 factors and sexuality dimensions was adequate.

In Study 1, the sample size was not sufficiently large to perform an analysis of all of the FBP items and those related to sexuality. We would have needed at least 10 participants per item. Therefore, this test was performed in Study 2, in which it was possible to obtain a proportion that exceeded 10 participants per item. The confirmatory models that were tested in Study 2 also showed data misfit to the five factors solution and indicated a more acceptable 12-factor solution that included the Big 5 factors and seven sexuality dimensions. Alternative one- and two-factor models for the sexuality dimensions and for the sexuality and Big 5 factors, which were proposed by Schmitt and Buss (2000), were also tested. In each case, the adjustment coefficients were poor.

To verify the independence of the sexuality dimensions and Big 5 factors, the predictive power of the sexuality characteristics to explain the variance in self-esteem beyond the proportion that was explained by the Big 5 factors was tested. The associations between the Big 5 factors and self-esteem were generally consistent among adults, explaining little more than 30% of the variance (Robins et al., 2001). Especially influential were Extraversion, Neuroticism, and Conscientiousness. Our results showed that in addition to the Big 5 factors, the sexuality dimensions significantly contributed to explaining the variance in self-esteem, although the increase was small compared with the proportion that was explained by the Big 5 factors. The sexuality dimensions that were especially relevant were Erotophilic Disposition, Sexual Restraint (negative), and Sexual Attractiveness (positive).

Altogether, our results indicate that both sexuality characteristics and the Big 5 factors assess different and independent aspects of human personality. As suggested by Schmitt and Buss (2000), aspects of sexuality have been considered important in several theories of personality in the history of psychology and have been ignored by other explanatory models of personality, such as the Big 5 factor model. Interestingly, the same lexical approach that supported the personality studies that led to the Big 5 factors (and that eliminated sexuality descriptors from lists of terms that were extracted from dictionaries through the application of exclusion criteria during the selection of personality attributes) also revealed seven consistent dimensions of personal characteristics that are related to sexuality. These dimensions, in addition to describing individual differences in important adaptive problems for our species (e.g., those related to the search, selection, and retention of romantic partners and consequently reproduction), can add explanatory power in the prediction models of other psychological variables.

The Big 5 factor model is widely applied mainly because it can integrate various theories of personality (c.f., John et al., 2010). Although the Big 5 factors are unable to describe the entire range of human characteristics, they are considered a broad and informative approach to assessing attributes of personality. A slight modification of the selection criteria for terms that are considered trait attributes may offer insights into a new system of personal characteristics, as demonstrated by Schmitt and Buss (2000) and the present study. This stresses the need to review the selection criteria of descriptor terms that are considered traits. Finally, empirical results should consider the choice of such criteria. For example, if temporal stability is a key-point to defining a personality trait, then this should also be a criterion when choosing the personality descriptors that are used in lexical studies.

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