SUMA PSICOLÓGICA

The Infidelity Scale: Psychometric properties and gender invariance among Portuguese adults

Telma Catarina Almeida [a,b,c,]*, Filipa Fernandes [a]

[a] *Instituto Universitário Egas Moniz, Caparica, Portugal*
[b] *CiiEM – Centro de Investigação Interdisciplinar Egas Moniz, Caparica, Portugal*
[c] *LabPSI – Laboratório de Psicologia Egas Moniz, Caparica, Portugal*

Abstract Introduction: Infidelity is a breach of trust or a crossing of the boundaries of the primary relationship and it influences intimate relationships. It can be categorised as either sexual or emotional infidelity. In Portugal, there have been few studies on this subject using suitable instruments. **Objective:** This study aimed to analyse the factor structure, psychometric properties, and gender invariance of the Infidelity Scale (IS) in Portuguese adults. **Method:** The sample comprised 660 Portuguese adults (455 women and 205 men) between 18 and 79 years of age who had been unfaithful in their relationships. **Results:** The confirmatory analysis showed a structure with two factors (sexual and emotional infidelity), and good values for convergent and discriminant validity were found. The results displayed a satisfactory model fit and the non-invariance of the factor structure between women and men. **Conclusion:** This is the first Portuguese version of the IS, an instrument for the study of intimate relationships which contributes to the development of multicultural research.

La Escala de Infidelidad: propiedades psicométricas e invariancia de género en adultos portugueses

Resumen Introducción: La infidelidad es una ruptura de la confianza que influye en las relaciones íntimas. Se puede dividir en infidelidad sexual o emocional. En Portugal, hay pocos estudios sobre este tema con medidas adecuadas. **Objetivo:** Esta investigación tiene como objetivo analizar la estructura factorial, las propiedades psicométricas y la invariancia de género de la Escala de Infidelidad (IS) entre adultos portugueses. **Método:** Se aplicó el protocolo de investigación a 660 adultos portugueses (455 mujeres y 205 hombres) de entre 18 y 79 años que fueron infieles en sus relaciones. **Resultados:** El análisis confirmatorio mostró una estructura con dos factores (infidelidad física y emocional), y se encontraron buenos valores de validez convergente y discriminante. Los resultados mostraron un ajuste satisfactorio del modelo y la no invariabilidad de la estructura factorial entre mujeres y hombres. **Conclusión:** Esta es la primera versión en portugués de la IS, como medida que permite estudiar las relaciones íntimas, contribuyendo para el desarrollo de la investigación multicultural.

* Corresponding author.
  Email: telma.c.almeida@gmail.com

The definition of the concept of infidelity is not consistent across the literature. However, it is most commonly characterized as short or long-term emotional and/or sexual involvement with someone outside of one's primary relationship (Brand et al., 2007). It can also be defined as a breach of trust or a crossing of the boundaries of the primary relationship (Blow & Hartnett, 2005) and is considered a violation of monogamy, which is perceived as unacceptable in Western culture (Fincham & May, 2017). Rayesh and Kalantar (2018) have observed differences between Muslim and non-Muslim behaviour regarding infidelity, with religion being a possible impact factor.

Research has identified several types of infidelity, including sexual infidelity, emotional infidelity, and composite infidelity. Physical infidelity (Drigotas et al., 1999), more recently labelled sexual infidelity (Buss, 2018), occurs when a person in an intimate relationship engages in sexual activity with someone who is not their husband/wife or boyfriend/girlfriend (Guitar et al., 2017) or privately uses pornography (McQueen, 2021). Emotional infidelity occurs when a member of the primary relationship devotes more time and attention (Guitar et al., 2017) and develops feelings of love (Moller & Vossler, 2015) toward another person outside of their primary relationship. Composite infidelity involves both sexual and emotional infidelity (Guitar et al., 2017).

A state of research on infidelity revealed that it occurs in 20-25% of all marriages (Fincham & May, 2017). A Portuguese study identified sexual infidelity rates of 68.7% for men and 66.7% for women in individuals who paid to register on the "Second Love" dating website (Rodrigues et al., 2017). Some studies identified the negative impact of infidelity on relationships and all those involved (e.g., Fife et al., 2022). Suspicion of infidelity can cause a partner to develop feelings of jealousy (Toplu-Demirtaş et al., 2022), and can lead to ambiguity in the relationship and intense emotions such as anger and sadness (Fife et al., 2022). Although there are many causes for the end of a marriage, such as family violence, low levels of partner trust, and low levels of love (Kloubučar & Simonič, 2017), infidelity is one of the most commonly reported causes of divorce (Apostolou et al., 2019). It can start to cause or increase conflicts in relationships and lead to intimate partner violence (Toplu-Demirtaş et al., 2022). Considering all this, the study of infidelity is especially important as it contributes to the development of research on intimate relationships and their dynamics. Research shows that infidelity is positively associated with intimate relationship violence and negatively associated with attachment and relationship satisfaction since infidelity is a prime source of relationship instability (Finn, 2011). It is also interesting to note that personalities associated with higher neuroticism (defined by emotional instability or affective lability) predict greater rates of infidelity (e.g., Whisman et al., 2007).

Prior research has indicated that there is an association between infidelity and gender (e.g., Pinto & Arantes, 2017). Scheeren et al. (2018) concluded that men were more involved in sexual infidelity and women were more involved in emotional infidelity. Arantes and Oliveira (2020) also showed that men adopt more extradyadic behaviours.

Several studies (e.g., Barta & Kiene, 2005; Beltrán-Morillas, 2022) concluded that infidelity can arise for different motives, including frustration, the need for affection and love, dissatisfaction with the primary relationship, neglect, anger (Barta & Kiene, 2005), and to increase self-esteem (Beltrán-Morillas, 2022). The inability to satisfy sexual and emotional needs, the desire for additional sexual encounters, low emotional satisfaction, the desire for additional emotional connection, and a person's desire to take revenge on their partner have been cited as reasons for infidelity (Omarzu et al., 2012). A study by Warach et al. (2018) concluded that higher levels of narcissism, prior infidelity, victimization, and disrupted attachment also predict infidelity. According to some studies (e.g., Liu & Zheng, 2019), these factors can also lead to an increase in online sexual activity. Wróblewska-Skrzek (2021) observed that the argument for infidelity differs according to gender.

A Portuguese study by Pinto and Arantes (2017) showed that emotional and sexual infidelity is related to sexual and emotional promiscuity. Studies in Portugal focus on responses to infidelity (Canto et al., 2017), perception of infidelity, attitudes toward infidelity (Rodrigues et al., 2016; Silva et al., 2017), and sexual infidelity (Rodrigues et al., 2017). However, the study that assesses sexual infidelity (Rodrigues et al., 2017) does not use a validated instrument, rather it uses only one question to evaluate infidelity. In Portugal, the phenomenon of infidelity has been little studied, and instruments have not often been applied to assess infidelity.

Instruments to assess infidelity

Several measurement instruments can be used to evaluate infidelity. Existing instruments assess the likelihood of engaging in extradyadic behaviours (Intentions towards Infidelity Scale: Jones et al., 2011); perception of infidelity (Perceptions of Dating Infidelity Scale: Wilson et al., 2011); direct emotional and sexual infidelity behaviours (Sexual and Emotional Infidelity Scale: Pinto & Arantes, 2017); attitudes and beliefs regarding infidelity (Attitudes Toward Infidelity Scale: Silva et al., 2017; tolerance of infidelity (Tolerance of Infidelity Scale: Domingues et al., 2017); and predisposition for infidelity (Propensity towards Infidelity Scale: Lisman & Holman, 2021). To the best of our knowledge, existing Portuguese-language measurement instruments do not provide information regarding the degree of involvement between partners in an extradyadic relationship.

The Infidelity Scale (IS; Drigotas et al., 1999) was created to assess the degree of physical and/or emotional intimacy in extradyadic relationships and encourages individuals to provide precise information and avoid social desirability bias. In this regard, the scale starts with questions about "minor" infidelities, which tend to be more socially accepted, while progressively asking about behaviours that are generally considered more serious infidelities. This instrument provides information concerning the intensity of extrarelational activities practiced with extradyadic partners by assessing the degree of physical intimacy and/or emotional attachment through an evaluation of sexual, emotional, and composite infidelity; and the level of attraction, arousal, emotional and sexual engagement. Drigotas et al. (1999) highlighted five motivational categories for infidelity: sexuality, emotional satisfaction, social context, attitudes-norms, and revenge-hostility. Satisfaction with the primary

relationship, the quality of the primary relationship, and investment in the primary relationship are essential factors for the occurrence of infidelity. According to the authors, commitment to a partner (psychological attachment and a motivation to continue a relationship) predicts infidelity.

The IS has been validated in Iran, with high alpha coefficients (Rayesh & Kalantar, 2018) but has not yet been translated into Portuguese, nor has it been adapted and validated in this language, which reinforces the importance of the present research. This study created a practical measurement instrument to evaluate the intensity and degree of involvement of partners and intensity of extradyadic relationships and other types of infidelity most commonly cited in the literature, addressing the instruments existing limitations in the Portuguese context. The objectives of this study were to: (a) analyse the factor structure and the psychometric properties of the Portuguese version of the Infidelity Scale; (b) verify the factor structure invariance between men and women; and (c) analyse convergent and divergent validation using the Affective Lability Scale – short version (ALS-18; Almeida et al., in press; Look et al., 2010) and the Dyadic Adjustment Scale (DAS; Gomez & Leal, 2008). This study chose to use the ALS (Almeida et al., in press) and the DAS (Gomez & Leal, 2008) as they have been adapted for the Portuguese population, show good psychometric properties, and are easy to use.

Method

Design

The study uses a cross-sectional design with a non-probabilistic sample. First, the translation of the IS from English to Portuguese followed the five-step adaptation process recommended by Beaton et al. (2000). The initial version was translated for participants of all genders to assess the degree of physical and/or emotional intimacy they have with their partners when in an extradyadic intimate relationship. Discrepancies were revised until no semantic differences were detected between the English and Portuguese versions of the IS. This revised version was then tested on Portuguese adults to ensure that individuals fully understood it. Since results from the pilot study were satisfactory, no additional changes were made to the Scale.

Participants

The study accepted participants of both sexes who were over 18 years old, and who had been in an intimate relationship. The total sample was made up of 3,015 Portuguese adults. Of the total sample, 2,355 people (78.11%) reported having never been in an extradyadic relationship. These participants were excluded from the study, resulting in a final sample of 660 (21.89%) Portuguese participants between 18 and 79 years old (*M* = 35.78, *SD* = 12.71), who were or had been involved in at least one extradyadic relationship. The majority of participants were women (*n* = 445, 67.4%), and most were currently employed (*n* = 448, 67.9%). Regarding the participants who were currently employed, the most commonly reported professional categories were

specialists in academic and scientific activities (*n* = 162, 27.0%). Of the total sample, 106 were students (17.7%). Just less than half of the sample was currently single (*n* = 307, 46.5%). Concerning participants' level of education, 252 had completed secondary education (38.2%), 235 held an undergraduate degree (35.6%), 87 had a master's degree (13.2%), 38 had completed middle school (5.8%), 23 had completed elementary school (3.5%), 15 did not fit into any of these educational categories (2.3%), seven held a Ph.D. (1.1%), and three had not completed elementary education (.5%).

Measurement instruments

Sociodemographic data. We constructed a brief questionnaire to collect sociodemographic data that asked for the participants' age, gender, marital status, level of education, employment status, and profession.

Infidelity Scale (IS; Drigotas et al., 1999). The IS is a self-reported measurement instrument used to assess the self-perceived degree of physical and/or emotional intimacy between the partners of an extradyadic relationship. Participants completed the Portuguese version of the Infidelity Scale which was comprised of 11 items. The items were quantified into 9-point scales, except for item 6, which had a 3-point scale. The categories for each question are different. The original version of the IS predicted two factors – physical (sexual) infidelity and emotional infidelity – with the investment model. The original instrument demonstrated adequate psychometric properties, with an alpha of .93. In the original and the Portuguese versions, participants were instructed to answer the questionnaire using a nine-point scale. The total score and each subscale score represented the level of intimacy between partners in an extradyadic relationship, with higher scale scores indicating higher levels of infidelity.

Affective Lability Scale – short version (ALS-18; Almeida et al., in press; Look et al., 2010). The ALS-18 is a self-reported measure composed of 18 items scored on a 4-point Likert scale (0 – *very uncharacteristic*, 1 – *uncharacteristic*, 2 – *characteristic*, 3 – *very characteristic*) and the total score ranges from 0 to 54 points. High scores indicate high affective lability. The Scale's total score reflects affective lability and there are three subscales: Anxiety/Depression, Depression/Elation, and Anger. The Portuguese version of ALS-18 presents good psychometric properties, with Cronbach's alphas of .95 (ALS-18 Total), .90 (Anxiety/Depression), .89 (Depression/Elation), and .86 (Anger).

Dyadic Adjustment Scale (DAS; Gomez & Leal, 2008). The DAS is a self-reported measure composed of 32 items scored on a 5-point scale. The Scale evaluates satisfaction in an intimate relationship. Higher scores indicate higher levels of satisfaction. The Scale comprises four subscales: Consensus, Satisfaction, Cohesion, Expression of Affection. DAS shows good psychometric properties, with Cronbach's alphas of .89 (DAS Total), .84 (Consensus), .83 (Satisfaction), .72 (Cohesion), and .65 (Expression of Affection).

Table 1. Standardized regression weights for factor structure

| Item	B (not standardized)	B (standardized)
Sexual Infidelity		
1. How attractive did you find this person? [*Quão atraente considerou/considera esta pessoa?*]	1	.53***
2. How attractive do you think this person found you? [*Quão atraente pensa que esta pessoa o/a considerou/considera?*]	1.08	.59***
3. How much arousal did you feel in their presence? [*Quanta excitação você sentiu/sente na presença desta pessoa?*]	1.54	.76***
4. How much time did you spend thinking about this person? [*Quanto tempo gastou/gasta a pensar sobre esta pessoa?*]	1.94	.79***
5. How much flirting occurred between the two of you? [*Quanta sedução/flirting ocorreu/ocorre entre vocês?*]	2.07	.83***
6. Who initiated the mutual attraction between the two of you? [*Quem iniciou a atração mútua entre vocês?*]	.01	.02***
Emotional Infidelity		
7. How often did you and this person do "couple" things together? [*Com que frequência você e esta pessoa faziam/fazem "coisas de casal" juntos?*]	1	.73***
8. How tempted were you to be emotionally intimate? [*Quão tentado/a ficou/fica para estar emocionalmente íntimo/a com esta pessoa?*]	1.13	.87***
9. How emo tionally intimate were you with this person? [*Quão emocionalmente íntimo/a estava/está com esta pessoa?*]	1.21	.89***
10. How tempted were you to be physically intimate? [*Quão tentado/a você ficou/fica para estar fisicamente íntimo/a com esta pessoa?*]	1.06	.84***
11. How physically intimate were you with this person? [*Quão fisicamente íntimo/a estava/está com esta pessoa?*]	1.19	.82***

Note. *** $p \leq .001$
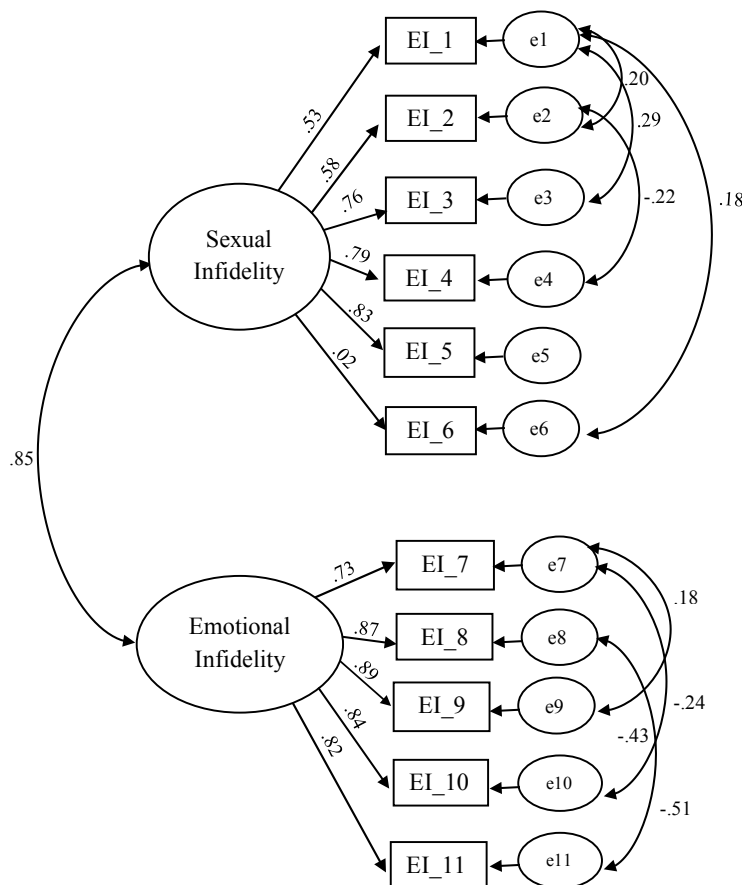
Figure 1. Factor structure of Infidelity Scale

Procedures

The final versions of the IS, the sociodemographic questionnaire, and the instruments referred to above were converted into Google Forms. The link to complete the questionnaires was disseminated online via e-mail and on social networks. Before completing the questionnaires through the web-based survey, all participants electronically signed an informed consent form. The researchers ensured both the confidentiality of participants' responses and their anonymity.

The study was conducted following the ethical principles outlined in the Declaration of Helsinki (World Medical Association, 2013) and the Ethical Principles of Psychologists and Code of Conduct (APA, 2017). The Institutional Review Board of the Instituto Universitário Egas Moniz approved the protocol, and no remuneration was granted for participation in the research.

Statistical analysis

The first step was to perform a confirmatory factor analysis (CFA) to assess the quality of the model fit (Marôco, 2014) and to compare it with the factor structure obtained by Drigotas et al. (1999) for the original version of the IS. We performed two CFAs, as the factor structure obtained in this study was different from the original version of the IS. We used the AMOS statistical software (Version 28.0, SPSS Inc., Chicago, IL) to perform these analyses. To assess the model parameter estimates, we used the maximum likelihood method and quality adjustment indices, namely: the comparative fit index (CFI), the goodness of fit index (GFI), the root means square error of approximation (RMSEA; 90% confidence interval), a chi-squared test (χ^2), and the Tucker-Lewis Index (TLI). We also used a chi-squared test (χ^2) to assess the differences between the two models. According to studies (Hair et al., 2009; Marôco, 2014), CFI, GFI, and TLI values above .90 indicate a good model fit. For the RMSEA, values below .05 also designate a good model fit. Criteria for a good model fit were values higher than .5 for all items regarding the factor weights. For specific patterns of correlated error terms for each factor, we correlated the errors of the same factor.

We examined both the convergent and discriminant validity of the psychometric properties of the IS. For reliability, we used Cronbach's alphas and composite reliability (CR), applying an additional measure of reliability as the IS has more than one subscale. Cronbach's alpha values above .60 and CR values above .70 are indicators of appropriate construct reliability (Hair et al., 2009).

Convergent validity can be verified when the average variance extracted (AVE) is ≥ .50 (Hair et al., 1998), while discriminant validity occurs when the AVE of the factors is greater than or equal to the square of the correlation between those factors (Marôco, 2014). We assessed the invariance of the factorial model across genders using a Multigroup Confirmatory Factor Analysis (MCFA). We tested the configural (structure equivalence), metric (factorial loadings equivalence), scalar (intercept equivalence), and strict invariance (residual or invariant uniqueness). We used the chi-square difference test ($\Delta\chi^2$) and the Comparative Fit Index difference test (ΔCFI) to assess the instrument inva-

riance (Cheung & Rensvold, 2002). Since $\Delta\chi^2$ is sensitive to sample dimension, some authors have questioned its use in large or heterogeneous samples (Marôco, 2014). To overcome this limitation, we used the ΔCFI since it is not affected by the model specification (Cheung & Rensvold, 2002). To evaluate the measurement invariance the ΔCFI value should be smaller or equal to .01 (Cheung & Rensvold, 2002).

Results

Construct validity

Factor validity. We performed a CFA using the original factor structure, which presented good and acceptable model fit indices (Figure 1), as indicated by GFI and CFI values above .90 and an RMSEA equal to .10 (χ^2(35) = 264.518; CFI = .95; GFI = .93; TLI = .90 RMSEA = .100 CI 90% [.089; .111]).

The study confirmed multivariate normality for all items, as skewness was lower than three and kurtosis was lower than seven (Kline, 2011). All items had factor weights higher than .5, except for item 6, whose scores were not statistically significant (Table 1). However, the item was not excluded from the assessment of the construct validity of a Portuguese version of the IS because it contains relevant information and because the values of the instrument do not change considerably with its removal.

Internal consistency. The current version of the IS demonstrated good psychometric properties. Two factors revealed good CR values above .70, equal to .71 for factor 1 (sexual infidelity) and .91 for factor 2 (emotional infidelity). For the reliability analysis, the Cronbach's alphas indicated good internal consistency for the total scale score (α = .91), for the sexual infidelity subscale (α = .80), and the emotional infidelity subscale (α = .91).

Convergent and discriminant validity. Concerning convergent validity (Table 2), only the emotional infidelity subscale presented a VEM [Variance Extracted Mean] ≥ .50, with a VEM of .69, and the sexual infidelity subscale showed a VEM equal to .38. Concerning discriminant validity, the VEM of each factor was greater than all correlation squares between the factors.

The IS factors were positively intercorrelated (r = .62, p < .001), the total scale was also positively correlated with Sexual Infidelity (r = .92, p < .001) and with Emotional Infidelity (r = .88, p < .001). The correlations between factors (sexual and emotional) were lower than .85 (cf. Netemeyer et al., 2003), revealing discriminant validity (i.e., the extent the construct is different from other constructs; Marôco, 2014). The IS total also showed significant negative correlations with DAS Expression of Affection (r = -.21, p = .040), and the IS Sexual Infidelity showed negative correlations with DAS Consensus (r = -.31, p = .002), DAS Expression of Affection (r = -.28, p = .006) and DAS total (r = -.27, p = .010).

We also considered the results obtained in ALS-18 total score and sub-scales to assess convergent validity (Table 3). By analysing the correlations between ALS-18 total score and subscales and the IS total score and factors, statistically significant positive correlations were found between all variables (scales and subscales). Specifically, the IS total score revealed statistically significant positive correlations

with Anxiety/Depression ALS-18 (r = .14, p = .003), Depression/Elation (r = .14, p = .004), Anger (r = .13, p = .007), and ALS-18 total (r = .15, p = .001), and the subscales of the IS also showed positive correlations with the ALS-18 subscales.

Factor structure invariance among genders. The study analysed measurement invariance using the Infidelity Scale. We performed a multigroup factor analysis to assess the invariance of the two-factor model structure between genders. The two-factor model showed an acceptable adjustment (χ^2(70) = 336.260, p < .001; CFI = .941; NFI = .927; RMSEA = .076; CI 90% [.068-.084]) for both the female and male samples. The $\Delta\chi^2$ and the ΔCFI did not reveal metric ($\Delta\chi^2$ (9) = 22.367, p = .008) or scalar invariance ($\Delta\chi^2$(20) = 125.802, p < .001). Consequently, these results confirmed the non-invariance of the factor structure between men and women (Table 4).

Discussion

The IS is an appropriate measurement instrument since it enables the degree of sexual and emotional infidelity to be assessed. To the best of our knowledge, no studies have previously been conducted in Portugal to assess the degree of both types of infidelity among Portuguese adults. In this respect, the study of this topic is particularly valuable, as infidelity is an important societal issue with important impacts on marital satisfaction and well-being in intimate relationships. This study aimed to analyse the psychometric properties and the factor structure of a Portuguese version of the Infidelity Scale, verify the invariance between Portuguese men and women, and analyse the convergent and divergent validation.

We observed good and acceptable model fit indices regarding the psychometric properties of the IS, and five of the six-factor loadings were above or close to .5, except for item 6.

Table 2. Correlations between IS total and scales, DAS total and scales (n = 660)

	Variable	1	2	3	4	5	6	7	8
1.	IS Sexual Infidelity	1							
2.	IS Emotional Infidelity	.62**	1						
3.	IS Total	.92**	.88**	1					
4.	DAS Consensus	-.31**	-.02	-.20	1				
5.	DAS Satisfaction	.08	.07	.08	-.14**	1			
6.	DAS Cohesion	-.04	.13	.04	.02	.09*	1		
7.	DAS Expression of Affection	-.28**	-.08	-.21*	.61**	-.01	.02	1	
8.	DAS Total	-.27**	.06	-.13	.83**	.32**	.36**	.62**	1

Note. *p < .05 **p < .01.

Table 3. Correlations between IS total and scales, and ALS-18 total and scales (n = 660)

	Variable	1	2	3	4	5	6	7
1.	IS Sexual Infidelity	1						
2.	IS Emotional Infidelity	.62**	1					
3.	IS Total	.92**	.88**	1				
4.	ALS Anxiety/Depression	.10*	.16**	.140**	1			
5.	ALS Depression/Elation	.09*	.15**	.14**	.67**	1		
6.	ALS Anger	.07	.16**	.13**	.68**	.66**	1	
7.	ALS Total	.10*	.18**	.15**	.88**	.91**	.86**	1

Note. *p < .05 **p < .01.

Table 4. Model fit statistics for the measurement model and factorial invariance

Description	χ^2	df	CFI	NFI	RMSEA	RMSEA CI (95%)
Unconstrained	22.37*	9	.94	.93	.076	.068 - .084
FL	125.80*	20	.94	.92	.073	.066 - .81
FL +SC	128.79*	23	.92	.90	.079	.072 - .086
FL + SC + MR	154.13*	42	.92	.89	.078	.171 - .085

Note. * p < .001. CFI = Comparative fit index; NFI = Non-normed fit index; RMSEA = Root mean square error of approximation; CI = Confidence interval 95%; FL = Factor loadings; SC = Structural covariances; MR = Measurement residuals.

In this regard, the researchers faced the dilemma of either removing item 6 or keeping it in, despite its factor loadings of below .5. We opted to maintain item 6 since the IS seeks to evaluate the degree of infidelity in a relationship. Removing this item could cause the Scale to lose its explanatory power. Removing the item did not improve the model fit. We confirmed convergent and discriminant validity for both subscales concerning the model's reliability. Therefore, we can conclude that most items measured the construct that was intended to be measured by the study. These findings indicate that the IS is a suitable measurement instrument to identify infidelity. These results are consistent with other studies that have previously been carried out using the IS (e.g., Fish et al., 2012).

The IS subscales showed a positive inter-correlation concerning discriminant validity, as was the case in other studies (Hertlein & Skaggs, 2005). However, these results were expected since each factor is a specific dimension that constitutes the affective lability construct. The negative correlations between DAS also point to IS discriminant validity. This result reflects findings in the literature that show associations between higher levels of dissatisfaction with the primary relationship or partner and higher levels of sexual infidelity (e.g., Scheeren et al., 2018). Convergent validity was assessed by correlating the IS total score and scales with ALS-18 total score and scales. As expected, significant and positive correlations were also found between IS and ALS-18. These results corroborate prior research linking infidelity and affective lability (e.g., Whisman et al., 2007).

This study revealed higher values for descriptive analyses than those obtained by Drigotas et al. (1999) for the original version of the IS. Our values are high, which has been the case in other studies (e.g., Rayesh & Kalantar, 2018). Despite the cultural and religious differences of the populations studied, the instrument seems to measure the intended target. Although the culture and religion in Western countries are different from those in Iran, the conclusions concerning infidelity in Iranian and Western studies are the same (Rayesh & Kalantar, 2018).

The IS demonstrated non-invariance across genders. This result does not corroborate prior studies (e.g., Træen et al., 2022). Verifying non-invariance responses would indicate that items need to be weighted to obtain similar responses across groups or that genders differ in their conceptualization of infidelity (Stavropoulos et al., 2018).

The multigroup CFA results demonstrated non-invariance based on gender. Thus, the IS reflected gender differences in the practice of infidelity. This is similar to the results of the majority of the literature, with many earlier studies finding differences between genders (e.g., Silva et al., 2017). For example, the study by Brand et al. (2007) of a sample of undergraduate students concluded that there were differences between men and women regarding the incidence of infidelity and, specifically, that women were more likely to be unfaithful than men. These differences can occur due to the interference of several variables, of these, relationship satisfaction has been most frequently mentioned (e.g., Isma & Turnip, 2019; Pinto & Arantes, 2017). For example, a study by Silva et al. (2017), with a sample of 1145 Portuguese participants, indicated that men tend to have lower levels of relationship satisfaction,

which can contribute to increased levels of infidelity. More recently, Hackathorn and Ashdown's (2021) study examining a sample of 545 adults from the United States found that being a man, primary relationship quality, and having an unrestricted sociosexual orientation were crucial predictors of infidelity.

This study corroborates earlier research regarding the prevalence of infidelity in a normative sample. The difference between the frequency of sexual and emotional infidelity was not significant in the study sample. Prior research has consistently reported higher incidences of sexual infidelity compared to emotional infidelity (e.g., Norona et al., 2017).

Limitations

This study has certain limitations, namely its sample size and that most participants were women. Due to these factors, and the fact that the sample was not representative of the Portuguese population, it is impossible to generalize our results. Furthermore, the sociodemographic questionnaire lacks certain variables that may influence the occurrence of infidelity, namely, questions related to religion (Hackathorn & Ashdown, 2021). Many scholars believe that less-religious individuals tend to have more liberal sexual attitudes toward infidelity, and therefore, are more likely to have extradyadic relationships (Ashdown et al., 2019). Moreover, another relevant variable that should be included in future studies concerns current relationship satisfaction. Multiple studies have shown that lower perceptions of primary relationship quality can increase the probability of occurrences of infidelity (González-Rivera et al., 2020). Also, the fact that most participants are single may influence the results. Some studies (e.g., Fish et al., 2012; Pinto & Arantes, 2017) have found that individuals currently in a relationship tend to be sexually more unfaithful than those who have been in relationships but are currently single. Finally, because infidelity continues to be a taboo in our society, this could cause a bias in the response to the questions and change some of the results.

Conclusion

Despite its limitations, the present study is the first to adapt the IS to the Portuguese population while demonstrating a good model fit. However, the results should be generalized with caution. Regarding the RMSEA value, despite being considered an acceptable value (Marôco, 2014), other studies indicate that indicate this value as a mediocre adjustment (MacCallum et al., 1996). This may be because the confidence intervals can be seriously influenced by sample size (MacCallum et al., 1996).

Recommendations for future research include the enhancing of the representativeness of the sample and including other sociodemographic variables, such as the duration of extradyadic relationships. Since several studies (e.g., Finn, 2011) point to relationship satisfaction as an important variable in infidelity, future studies should include this variable's mediating role in infidelity. Future research should also include qualitative methods for assessing infidelity.

Acknowledgements

Conflict of interest

The authors declare no conflict of interest.

Funding

References

Almeida, T. C., Fernandes, R. M., & Cunha, O. (in press). Brief measure of affective lability among Portuguese community and justice samples: Psychometrics and measurement invariance. *Crime & Delinquency*.

APA (2017). *Association's (APA) ethical principles of psychologists and code of conduct*. American Psychology Association.

Apostolou, M., Constantinou, C., & Anagnostopoulos, S. (2019). Reasons that could lead people to divorce in an evolutionary perspective: Evidence from Cyprus. *Journal of Divorce & Remarriage*, *60*(1), 27-46. https://doi.org/10.1080/10502556.2018.1469333

Arantes, J., Barros, F., & Oliveira H. (2020). Extradyadic behaviors and gender: How do they relate with sexual desire, relationship quality, and attractiveness. *Frontiers in Psychology, 10*(2554), 1-12. https://doi.org/10.3389/fpsyg.2019.02554

Ashdown, B. K., Hackathorn, J. M., & Daniels, J. (2019). Scandalous: Christian identification, sex guilt, and the mediated demonization of the participants in the AshleyMadison scandal. *The Journal of Social Psychology, 159*(3), 244-256. https://doi.org/10.1080/00224545.2018.1461603

Barta, W., & Kiene, S. (2005). Motivations for infidelity in heterosexual dating couples: The roles of gender, personality differences, and sociosexual orientation. *Journal of Social and Personal Relationships, 22*(3), 339-360. https://doi.org/10.1177/0265407505052440

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*(24), 3186-3191. https://doi.org/10.1097/00007632-200012150-00014

Beltrán-Morillas, A. M., Alonso-Ferres, M., Garrido-Macías, M., Villanueva-Moya, L., Sánchez-Hernández, M. D., & Expósito, F. (2022). The relationship between the motivation to commit infidelity and negative affect and self-esteem: How cheating in romance might signal positive well-being in adolescents. *Psychological Reports, 125*(1), 517-544. https://doi.org/10.1177/0033294120973947

Blow, A., & Hartnett, K. (2005). Infidelity in committed relationships: A methodological review. *Journal of Marital and Family Therapy, 31*(2), 183-216. https://doi.org/10.1111/j.1752-0606.2005.tb01555.x

Brand, R., Markey, C., Mills, A., & Hodges, S. (2007). Sex differences in self-reported infidelity and its correlates. *Sex Roles, 57*, 101-109. https://doi.org/10.1007/s11199-007-9221-5

Buss, D. M. (2018). Sexual and emotional infidelity: Evolved gender differences in jealousy prove robust and replicable. *Perspectives on Psychological Science, 13*(2) 155-160. https://doi.org/10.1177/1745691617698225

Canto, J. M., Alvaro, J. L., Pereira, C., Garrido, A., Torres, A. R., & Pereira, M. E. (2017). Jealousy, gender, and culture of honor: A study in Portugal and Brazil. *The Journal of Psychology, 151*(6), 580-596. https://doi.org/10.1080/00223980.2017.1372344

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Domingues, A. F., Marques, M. V., & Simões, S. C. (2017). Estudo preliminar de adaptação e validação da Escala de Tolerância à Infidelidade. *Revista Portuguesa De Investigação Comportamental e Social, 3*(1), 27-40. https://doi.org/10.7342/ismt.rpics.2017.3.1.46

Drigotas, S., Saftrom, A., & Gentilia, T. (1999). An investment model prediction of dating infidelity. *Journal of Personality and Social Psychology, 77*(3), 509-524. https://doi.org/10.1037/0022-3514.77.3.509

Fife, S. T., Theobald, A. C., Gossner, J. D., Yakum, B. N., & White, K. L. (2022). Individual healing from infidelity and breakup for emerging adults: A grounded theory. *Journal of Social and Personal Relationships, 39*(6), 1814-1838. https://doi.org/10.1177/02654075211067441

Fincham, F. D., & May, R. W. (2017). Infidelity in romantic relationships. *The Current Opinion in Psychology, 13*, 70–74. https://doi.org/10.1016/j.copsyc.2016.03.008

Finn, M. (2012). Monogamous order and the avoidance of chaotic excess. *Psychology and Sexuality, 3*(2), 123–136. https://doi.org/10.1080/19419899.2011.551834

Fish, J., Pavkov, T., Wetchler, J., & Berrick, J. (2012). Characteristics of those who participate in infidelity: The role of adult attachment and differentiation in extradyadic experiences. *The American Journal of Family Therapy, 40*, 214-229. https://doi.org/10.1080/01926187.2011.601192

Gomez, R., & Leal. I. (2008). Ajustamento conjugal: Características psicométricas da versão portuguesa da Dyadic Adjustment Scale *[Marital adjustment: Psychometric characteristics of the Portuguese version of the Dyadic Adjustment Scale]. Análise Psicológica, 4*, 625-638. https://doi.org/10.14417/ap.522

González-Rivera, J., Aquino-Serrano, F., & Pérez-Torres, E. (2020). Relationship satisfaction and infidelity-related behaviors on social networks: A preliminary online study of Hispanic women. *Investigation in Health, Psychology, and Education, 10*(1), 297-307. https://doi.org/10.3390/ejihpe10010023

Guitar, A. E., Geher, G., Kruger, D. J., Garcia, J. R., Fisher, M. L., & Fitzgerald, C. J. (2017). Defining and distinguishing sexual and emotional infidelity. *Current Psychology, 36*(3), 434–446. https://doi.org/10.1007/s12144-016-9432-4

Hackathorn, J., & Ashdown, B. K. (2021). The webs we weave: Predicting infidelity motivations and extradyadic relationship satisfaction. *The Journal of Sex Research, 58*(2), 1-13. https://doi.org/10.1080/00224499.2020.1746954

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Prentice-Hall.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Multivariate Data Analysis* (7th ed.). Prentice-Hall.

Hertlein, K. M., & Skaggs, G. (2005). Assessing the relationship between differentiation and infidelity: A structural equation model. *Journal of Couple & Relationship Therapy, 4*(2-3), 195-213. https://doi.org/10.1300/J398v04n02_16

Isma, M., & Turnip, S. (2019). Personality traits and martial satisfaction in predicting couples' attitudes toward infidelity. *Journal of Relationship Research, 10*(13), 1-5. https://doi.org/10.1017/jrr.2019.10

Jones, D. N., Olderbak, S. G., & Figueredo, A. J. (2011). The intentions towards infidelity scale. In T. D. Fisher, C. M. Davis, W. L. Yarber & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (3rd ed., pp. 251-253). Routledge.

Kline, R. (2011). *Principles and practice of structural equation modeling* (3rd ed.). Guilford Press.

Kloubučar, N., & Simonič, B. (2017). Causes of divorce from the perspective of females in Slovenia. *Journal of Divorce & Remarriage, 58*(4), 1-13. https://doi.org/10.1080/10502556.2017.1300024

Liu, Y., & Zheng, L. (2019). Influences of sociosexuality and commitment on online sexual activities: The mediating effect of perceptions of infidelity. *Journal of Sex & Marital Therapy, 44*(5), 1-11. https://doi.org/10.1080/0092623X.2018.1549632

Lisman, C. G., & Holman, A. C. (2021). Cheating under the circumstances in marital relationships: The development and examination of the Propensity towards Infidelity Scale. *Social Sciences, 10*, 392. https://doi.org/10.3390/socsci10100392

Look, A. E., Flory, J. D., Harvey, P. D., & Siever, L. J. (2010). Psychometric properties of a short form of the affective lability scale (ALS-18). *Personality and Individual Differences, 49*, 187-191. https://doi.org/10.1016/j.paid.2010.03.030

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149. https://doi.org/10.1037/1082-989X.1.2.130

Marôco, J. (2014). Análise de equações estruturais: Fundamentos teóricos, software & aplicações *[Analysis of structural equations: Theoretical foundations, software & applications]* (2nd ed.). CAFILESA.

McQueen, P. (2021). Sexual interactions and sexual infidelity. *The Journal of Ethics, 25*, 449-466. https://doi.org/10.1007/s10892-021-09359-1

Moller, N. P., & Vossler, A. (2015). Defining infidelity in research and couple counseling: A qualitative study. *Journal of Sex & Marital Therapy, 41*(5), 487-497. https://doi.org/10.1080/0092623X.2014.931314

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Sage.

Norona, J. C., Olmstead, S. B., & Welsh, D. P. (2017). Breaking up in emerging adulthood: A developmental perspective of relationship dissolution. *Emerging Adulthood, 5*(2), 116-127. https://doi.org/10.1177/2167696816658585

Omarzu, J., Miller, A., Schultz, C., & Timmerman, A. (2012). Motivations and emotional consequences related to engaging in extramarital relationships. *International Journal of Sexual Health, 24*(2), 154-262. https://doi.org/10.1080/19317611.2012.662207

Pinto, R. & Arantes, J. (2017). The relationship between sexual and emotional promiscuity and infidelity. *Athens Journal of Social Sciences, 4*(4), 385-398. https://doi.org/10.30958/ajss.4-4-3

Rayesh, N., & Kalantar, S. M. (2018). The role of praying for the spouse and sanctification of marriage in reducing infidelity. *Mental Health, Religion & Culture, 21*(1), 65-76. https://doi.org/10.1080/13674676.2018.1447555

Rodrigues, D., Lopes, D., & Pereira, M. (2016). ''We agree and now everything goes my way'': Consensual sexual nonmonogamy, extradyadic sex, and relationship satisfaction. *Cyberpsychology, Behavior, and Social Networking, 19*(6), 373-379. https://doi.org/10.1089/cyber.2016.0114

Rodrigues, D., Lopes, D., & Pereira, M. (2017). Sociosexuality, commitment, sexual infidelity, and perceptions of infidelity: Data from the Second Love web site. *The Journal of Sex Research, 54*(2), 241-253. https://doi.org/10.1080/00224499.2016.1145182

Scheeren, P., Apellániz, I., & Wagner, A. (2018). Marital infidelity: The experience of men and women. *Trends in Psychology, 26*(1), 355-369. https://doi.org/10.9788/TP2018.1-14Pt

Silva, A., Saraiva, M., Albuquerque, P., & Arantes, J. (2017). Relationship quality influences attitudes toward and perceptions of infidelity. *Personal Relationships, 24*(4), 718-728. https://doi.org/10.1111/pere.12205

Stavropoulos, V., Beard, C., Griffiths, M. D., Buleigh, T., Gomez, R., & Pontes, H. M. (2018). Measurement invariance of the Internet Gaming Disorder Scale-Short-Form (IGDS9-SF) between Australia, the USA, and the UK. *International Journal of Mental Health and Addiction, 16*(2), 377-392. https://doi.org/10.1007/s11469-017-9786-3

Toplu-Demirtaş, E., Akcabozan-Kayabol, N. B., Araci-Iyiaydin, A., & Fincham, F. D. (2022). Unraveling the roles of distrust, suspicion of infidelity, and jealousy in cyber dating abuse perpetration: An attachment theory perspective. *Journal of Interpersonal Violence, 37*(3-4), 1432-1462. https://doi.org/10.1177/0886260520927505

Træen, B., Kvalem, I., Hald, G., & Graham, C. (2022). Extradyadic activity in European older adults. *Sexual and Relationship Therapy, 31*(1), 125-138. https://doi.org/10.1080/14681994.2019.1685085

Warach, B., Josephs, L., & Gorman, B. (2018). Pathways to infidelity: The roles of self-serving bias and betrayal trauma. *Journal of Sex & Marital Therapy, 44*(5), 497-512. https://doi.org/10.1080/0092623X.2017.1416434

Wilson, K., Mattingly, B., Clark, E., Weidler, D., & Bequette, A. (2011). The gray area: Exploring attitudes toward infidelity and the development of the perceptions of dating infidelity scale. *The Journal of Social Psychology, 151*(1), 63-86. https://doi.org/10.1080/00224540903366750

Whisman, M. A., Gordon, K. C., & Chatav, Y. (2007). Predicting sexual infidelity in a population-based sample of married individuals. *Journal of Family Psychology, 21*, 320-324. https://doi.org/10.1037/0893-3200.21.2.320

World Medical Association (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191-2194. https://doi.org/10.1001/jama.2013.281053

Wróblewska-Skrzek, J. (2021). Infidelity in relation to sex and gender: The perspective of sociobiology versus the perspective of sociology of emotions. *Sexuality & Culture 25*, 1885-1894. https://doi.org/10.1007/s12119-021-09845-6