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Psychometric properties of the Portuguese Self-Monitoring Scale: A reduced item version

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ABSTRACT

This study aimed to contribute to the adaptation of the Self-Monitoring Scale for a Portuguese sample and the examination of the possibility of reducing the scale's length. Considering the psychometric inconsistency of the scale reported in the literature, several analysis criteria to identify the number of factors to be retained were considered. The study included 791 Portuguese men and women aged 17 to 61 years. Data analysis included descriptive statistics, confirmatory factor analysis to assess construct validity, Cronbach's alpha to assess internal consistency, and fit indices (based on IRT). The results indicate a two-dimensional structure with a reduction to 9 items, which shows good values for validity and fit. This study proposes a reduced version of the self-monitoring scale for a Portuguese sample, considering that the use of this method is valuable to identify how individuals differ in the way they present themselves in social situations..

Keywords: psychometric properties; self-monitoring; scale; validation; Portuguese sample.

RESUMO – Propriedades Psicométricas da escala Portuguesa de *Self-Monitoring*: Uma versão reduzida

Este estudo tem como objetivo contribuir para a adaptação da *Self-Monitoring Scale* numa amostra Portuguesa e análise da possibilidade de reduzir o tamanho da escala. Além disso, e considerando a inconsistência psicométrica da escala relatada na literatura, foram considerados vários critérios de análise para identificar o número de fatores a reter. O estudo abrangeu 791 homens e mulheres Portugueses com idades entre os 17 e os 61 anos. A análise dos dados incluiu estatística descritiva, validade de construto (Análise Fatorial Confirmatória), consistência interna e índice de ajustamento (TRI). Os resultados apontam para uma estrutura bidimensional com uma redução para 9 itens, mostrando bons valores de validade e ajustamento. Este estudo propõe uma versão reduzida da escala de self-monitoramento para uma amostra Portuguesa, considerando que a utilização deste método é uma mais-valia para identificar como os indivíduos diferem na forma como se apresentam em situações sociais.

Palavras-chave: propriedades psicométricas; self-monitoramento; escala; validação; amostra Portuguesa.

RESUMEN – Propiedades psicométricas de la escala Portuguesa de Self-Monitoring: una versión reducida

Este estudio tiene como objetivo contribuir a la adaptación de la *Self-Monitoring Scale* en una muestra portuguesa y analizar la posibilidad de reducir el tamaño de la escala. Además, teniendo en cuenta la inconsistencia psicométrica de la escala reportada en la literatura, se consideraron varios criterios de análisis para identificar el número de factores a retener. El estudio incluyó a 791 hombres y mujeres portugueses de entre 17 y 61 años. El análisis de los datos incluyó estadística descriptiva, validez del constructo (Análisis Factorial Confirmatorio), consistencia interna e índice de ajuste (TRI). Los resultados apuntan a una estructura bidimensional con una reducción a 9 ítems, mostrando buenos índices de validez y ajuste. Este estudio propone una versión reducida de la escala de automonitoramento para una muestra portuguesa, mientras que el uso de este método es particularmente valioso para identificar cómo los individuos se diferencian en la forma en que se presentan en situaciones sociales.

Palabras clave: propiedades psicométricas; automonitoramento; escala; validación; muestra portuguesa.

Why are some individuals considered to be good social actors? Why are some people better than others in the control of their expressive behaviour? These are some questions that can be answered by Snyder's self-monitoring theory (1974, 1979). Self-monitoring can be defined as a personality trait related to the individual differences that exist in the way people observe, regulate, and control their image and expressive behavior (Snyder, 1974). According to Snyder (1974), individuals differ in how they react to social cues to regulate their behaviour, adapting their self-presentation to social situations. According to the theory of self-monitoring, this personality trait represents a univariate individual difference; that is, it manifests itself in two classes of people: high and low self-monitoring (Snyder, 1974). High self-monitors are motivated to adjust their self-presentation to the

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social context, whereas low self-monitors are motivated to be themselves. Thus, individuals high or low in self-monitoring differ in how they exhibit themselves to others, in the ability to control their expressive behaviour, in their motivation, and in their use of skills relevant to self-presentation, focusing their attention on different sources of information to create a standard of appropriate behaviour (Sommerfeld, 2007; Snyder, 1974, 1979).

High self-monitors are considered "chameleons of the world," willing to change their behaviour depending on the environment where they are (Snyder, 1974), and adapt their behaviour to the surrounding environment through social comparison, selecting one among the many selves that they have (Snyder, 1974). That is, they control their self-presentation using a repertoire of behaviours that allows them to identify what is socially appropriate in a given situation or face different social groups (Snyder, 1979). Also, high self-monitors perform better in sales activities (Kückelhaus et al., 2020), are more likely to use impression management tactics, as well as mitigating the adverse effect of stress factors in the workplace, such as ostracism or gossip (e.g., Xie et al., 2019). On the other hand, low self-monitors seek to be themselves in different social situations (Gangestad & Snyder, 2000), resort to introspection, and focus their attention on adjusting their behaviour to their thoughts, beliefs and feelings. Thus, their behaviour is consistent even in different social situations; they are motivated by reasons which do not differ from one situation to another (Gangestad & Snyder, 2000). That is, they typically act in ways that are congruent with their internal attitudes and dispositions (Fuglestad & Snyder, 2010). Despite the predominantly positive view of self-monitoring in the literature, there is also evidence about some negative or undesirable results of this trait, both for individuals and organizations (e.g., unfair decision-making, tendency to be dishonest and self-oriented, negative implications for employee well-being, among others) (see Kudret et al., 2019 for a review).

The first instrument to measure the differences between high and low self-monitors was developed by Snyder (1974). After its initial success, the scale entered into a controversial period and received some criticism (e.g., Montgomery et al., 2011, 2016). The main criticism of the scale relates to dimensionality; i.e., the scoring format (Briggs et al., 1980; Lennox & Wolfe, 1984) and its typological characteristics (i.e., high/low self-monitors; Miller & Thayer, 1989). For example, Briggs et al. (1980) identified three factors that they termed Acting ability, Extraversion, and Other-directedness, claiming that there may be a "gap between the construction of self-monitoring and its operation in the Self-Monitoring Scale" (p. 586). Moreover, Gabrenya and Arkin (1980) identified four factors (Acting ability, Extraversion, Other-directedness, and Speaking Ability). This structure is confirmed by Hosch and Marchioni (1986) in their study of Snyder's scale adaptation for Mexican, Mexican American, and Anglo-American samples.

This debate about the scale gave rise to two new scales for self-monitoring: a 13-item scale developed by Lennox and Wolfe (1984) which is evaluated using a continuous scoring format, and the Gangestad and Snyder (1985) reduced version of The Self-Monitoring Scale (SMS), which has 18 items – 7 items were eliminated from the original scale. Later, Lennox (1988) conducted a confirmatory factor analysis of the Gangestad and Snyder scale (1985), suggesting the existence of two orthogonal factors called acquisitive and self-monitoring protective. Similar to the Briggs at al. (1980) study, Ghana and Brechenmacher (2001) in their adaptation of the SMS (18 items) for the French population, found three dimensions (Acting Ability, Extraversion, and Other-directedness), while Paredes, Stavraki et al. (2015) in their study of scale adaptation for the Spanish population identified two dimensions (Public Performing and Other-Directedness; see Table 1). Of note are two studies with Portuguese samples where Neto (1993) obtained a two-dimensional structure (Public Performing and Other-Directedness) and Barreiros (2012) a 7-factor structure, although the first factor explains 21% of the total variance and emerges clearly highlighted in the scree plot.

Table 1
Different operationalization's of the SMS[2]

Author(s)	Study Objective	Scale	Dimensions
Snyder, 1974	Scale Development	The Self-Monitoring Scale – 25 items	Unidimensional
Briggs, Cheek and Buss, 1980	Scale psychometric analysis	The Self-Monitoring Scale – 25 Items (Snyder, 1974)	1. Acting Ability 2. Extraversion 3. Other-Directedness
Gabrenya and Arkin, 1980	Factor analyses of Snyder's Self-Monitoring Scale	The Self-Monitoring Scale – 25 Items (Snyder, 1974)	1. Acting Ability 2. Extraversion 3. Other-Directedness 4. Speaking Ability

[2] Not included Lennox and Wolfe scale (1984) since it is a different scale than that developed by Gangestad and Snyder (1985).

Table 1 (continuation)
Different operationalization's of the SMS[2]

Author(s)	Study Objective	Scale	Dimensions
Gangestad and Snyder, 1985	Scale reduction	The Self-Monitoring Scale – 18 Items	Gangestad and Snyder (1985) revealed three factors (self-control, social stage presence, and other-directed self-presentation). They argue, however, that the focus should be on the unrotated factor structure.
Hosch and Marchioni, 1986	To determine the factorial structure of Snyder's (1974) Self-Monitoring Scale (SM) for Mexican, Mexican American, and Anglo-American samples	The Self-Monitoring Scale – 25 Items (Snyder, 1974)	1. Acting Ability 2. Extraversion 3. Other-Directedness 4. Speaking Ability
Lennox, 1988	Scale psychometric analysis	The Self-Monitoring Scale – 18 Items (Gangestad & Snyder, 1985)	1. Acquisitive self-presentation (items 1, 3, 4, 5, 6, 7, 9, 12, 13, 14, 15, 16, 17) 2. Protective self-presentation (items 2, 8, 10, 11, 18)
Gana and Brechenmacher, 2001	Adaptation and validation for the French population	The Self-Monitoring Scale Revised – 18 Items from Gangestad and Snyder (1985)	1. Acting Ability (items 1, 3, 4, 5, 6, 12, 13, 17) 2. Other-Directedness (items 2, 8, 10, 11, 18) 3. Extraversion (items 7, 9, 14, 15, 16)
Paredes et al., 2015	Adaptation and validation for the Spanish population	Short version (9 items) from Gangestad and Snyder´s (1985) scale	1. Public Performing (items 2,3,4,5,6,7) 2. Other-Directedness (items 1,8,9)

According to Wilmot (2011), the debate on which instrument operates better continues, depending on the research line followed by researchers (Briggs & Cheek, 1988; Gangestad & Snyder, 1991; Hoyle & Lenox, 1991; Shuptrine et al., 1990). Research conducted by Gangestad and Snyder in 2000, in response to persistent claims about the multidimensionality of the original scale and the operationalization of the construct, indicates that both scales (25 and 18 items) reflect a single dimension (Wilmot, 2011). Although in the literature self-monitoring is described as a dichotomous variable (high vs. low self-monitors), the disagreement over the best way to evaluate self-monitoring remains unresolved (Leone, 2006). However, in recent studies, Wilmot (2015) and Wilmot et al., (2016) concluded that self-monitoring is a quantitative construct ordered along a continuum of expressive increasing/decreasing behavioral control, not a qualitative construction approach that manifests itself in two classes of people (i.e., high and low self-monitoring).

In addition to the validation studies for other populations (e.g., French (Ghana & Brechenmacher, 2001), Turkish (Bacanlı, 1990), Spanish (Gabrenya & Arkin, 1980; Hosch & Marchioni, 1986; Paredes et al., 2015), and other investigations have linked the self-monitoring construct to variables such as personality (e.g., Barrick et al., 2005), job performance (Caligiuri & Day, 2000), and conflict management style (e.g., Kaushal & Kwantes, 2006), among others.

In summary, whether self-monitoring measures one or more dimensions, high self-monitors tend to be confident, sociable, and competent in social relations (Montgomery et al., 1987), while low self-monitors tend to be more reserved, introspective, and true to themselves. Self-monitoring is assumed to be a construct of extreme importance for understanding social behaviour, whether in the social sphere (e.g., social integration (Guarino et al., 1998)) or in the organizational sphere (e.g., job selection (Evans, 2008)). Recent studies have also shown that self-monitoring has implications for well-being, and that high self-monitors can be authentic individuals (e.g., Pillow et al., 2017).

Although the literature presents several scales for measuring self-monitoring (see table 1), it is not possible to say that one scale is better than another, or that one measures the construct of self-monitoring better than another. Thus, in this adaptation study for a Portuguese sample, we opted for Gangestad and Snyder´s (1985) scale, since these authors were the pioneers of this instrument. On the other hand, although the original scale items are dichotomous or categorical (True / False), the evidence found in the literature (e.g., Wilmot, 2015; Wilmot et al., 2016) reinforces and justifies the use of a multiple-option response scale in this study.

Thus, and given its importance and the scarcity of instruments to evaluate this construct, particularly in Portugal, it is our objective to contribute to the adaptation of Gangestad and Snyder's SMS (1985) for a Portuguese sample through construct analysis (exploratory factor analysis and confirmatory), internal consistency assessment, and examination of the possibility of reducing the scale's length without losing its psychometric properties. On the other hand, and considering the psychometric inconsistency of the scale which has been reported in the literature, it was decided to consider other criteria for the

analysis of the results and identification of the number of factors to be retained (Kaiser rule, Cattel´s scree plot, Velicer´s MAP and Horn´s parallel analysis).

Method

Sample

This study used a convenience sample composed of 791 participants (M_{age}=25.54; SD_{age}=9.44; range=17-61), of whom 68.1% (N=539) were male. Most respondents were single (81.4%), about 58.4% had completed higher education, and 59.3% had no occupation (students, retired, or unemployed).

Measures

Self-Monitoring Scale (SMS): Self-monitoring was measured using the 18-item reduced scale developed by Gangestad and Snyder (1985). Example of included item is: "I'm not always the person I appear to be". Item scores are averaged to form an overall score for self-monitoring. Higher scores indicated the respondent carried out a greater level of self-monitoring. Contrasting with the revised version of the Self-Monitoring Scale by Gangestad and Snyder (1985) in which the answer is given in dichotomous form (False/True), the Portuguese version uses a Likert-type response scale ranging from 1 – Totally Untrue to 7 – Totally True. A dichotomous response scale (true / false) might limit the manifestation of behaviors (see above an item example) (Kline, 2005), and Self-Monitoring scales that use a polytomous scoring format have a higher internal consistency than those using only dichotomous scoring (Day et al., 2002). Additionally, a scale with an odd number of points makes it easy to answer due to the intermediate points, which on the one hand, acts as a neutral level of agreement and disagreement, and are a more viable option for respondents who do not have an opinion on the item (Weems & Onwuegbuzie, 2001). This also increases reliability (e.g., Courtenay & Weidemman, 1985). Scores taken from scales were obtained by averaging the items.

Procedures

Upon approval by the Scientific Committee (entity responsible for monitoring the procedures and ethical safeguards of research) and obtaining participants' informed consent, participants were asked to answer a self-reported questionnaire with an average completion time of 15 minutes. Data collection was performed in several places collectively, namely, in university classes and individually on other public places, such as libraries, organizations and public services. The effect of individual versus collective application was analysed, and no effect was observed (p>.1), so this methodological variability was not considered. No compensation was offered to participants and the study subject was withheld. After the data collection, a debriefing was carried out.

The equivalence of the two versions of the questionnaire was supported through a translation and back-translation process (Hambleton, 2005). First, the scale was translated from English into Portuguese by two bilingual specialists working independently. Secondly, both versions were back-translated into English by two other bilingual specialists, also working independently. The translations were compared to the original and adjusted by three psychologists who are experts in this area. To test the translation and to correct possible semantic problems, 15 participants were asked to answer the Portuguese version (pre-test). This pre-test shows a Cronbach alpha above 0.70, and no interpretation problems were detected. These participants were not included in the final sample.

Data Analysis

The data analysis was performed using the SPSS 22 statistical package and AMOS 20 software and the cut-off probability for statistical significance was set at 0.05 (Fisher, 1973). The psychometric properties of the SMS were evaluated by exploratory and confirmatory factor analysis, Cronbach's alpha measure of internal consistency, and adjustment indices obtained by the Rasch Rating Scale model, using WinSteps 3.61.1 software. In order to analyse cross-validity (Floyd & Widaman, 1995), the sample was randomly divided into two parts by the SPSS sample selection procedure: 390 participants for exploratory analysis and 401 participants for confirmatory analysis (Worthington & Whittaker, 2006). The self-monitoring scale was subjected to an initial exploratory factor analysis (EFA), justified by the fact that the authors consider the scale to assess two factors, but the construct of self-monitoring can be considered one-dimensional (Paredes et al., 2015). In order to identify the more statistically adjusted and theoretically supported structural model, different criteria were considered for the retention of the extracted factors (Courtney, 2013), namely, 1. The Kaiser rule, in which factors with a eigenvalue greater than 1 are considered; 2. Cattell's Scree test (1966) in which factors resulting from the graphic observation are retained with different eigenvalues of the factors; 3. Velicer's minimum average partial (MAP; 1976), in which the principal component analysis is followed by an analysis of the matrix of partial correlations; and 4. Horn's parallel analysis (1965), which takes into account the proportion of variance resulting from sampling error. To calculate the number of factors to retain by the criteria of partial minimum mean and by parallel analysis, syntaxes developed by O'Connor (2000) were used. For the remaining criteria (Kaiser Rule and Scree Test), the procedures performed by default in SPSS version 22.0 were considered. In confirmatory factor analysis, the following criteria were considered (Byrne, 2001): CMIN/DF (should vary between 2 and 5); Comparative Fit Index (CFI) and Goodness of Fit Index (GFI) that vary between 0 and 1, assuming 0.90 to be a good adjustment

value (Bentler & Bonnet, 1980); and Root-Mean Square Error of Approximation (RMSEA) with an ideal value between 0.05 and 0.08, accepting values up to 0.10. Internal consistency was assessed by Cronbach's alpha (Nunnally, 1978).

Results

Descriptive statistics

Analyses of the items regarding mean scores, standard deviations, corrected item-total correlation, and Cronbach's alpha if the item is deleted are shown in Table 2. The items' means vary between 4.39 (item 9) and 2.34 (item 18). In terms of the corrected item-total correlation (α ranges from 0.17 to 0.55), the items were all above 0.30 (Nunnally & Bernstein, 1994) except for items 2, 3, 9, 10, 11, and 16. Measures of skewness and kurtosis showed that the distributions of the 18 item scale were normal (skewness from -0.24 to 1.27 and kurtosis from -1.22 to 0.74), since they are below 2 and 7 respectively (Bentler & Wu, 2002; Finney & Distefano, 2006).

Table 2
Items descriptive statistics

Item	M	SD	Corrected item-total correlation	Cronbach's alpha (α) if item deleted	Sk SE=0.09	Ku SE=0.17
1. I find it hard to imitate the behavior of other people	3.87	1.61	0.35	0.76	0.04	-0.68
2. At parties and social gatherings, I do not attempt to do or say things that others will like	3.21	1.72	0.28	0.76	0.43	-0.83
3. I can only argue for ideas which I already believe	2.83	1.69	0.25	0.76	0.81	-0.26
4. I can make impromptu speeches even on topics about which I have almost no information	3.83	1.69	0.37	0.76	0.04	-0.95
5. I guess I put on a show to impress or entertain others	2.71	1.71	0.55	0.74	0.82	-0.35
6. I would probably make a good actor	3.37	1.93	0.54	0.74	0.31	-1.16
7. In a group of people I am rarely the center of attention	3.50	1.64	0.34	0.76	0.17	-0.80
8. In different situations and with different people, I often act like very different persons	4.01	1.87	0.47	0.75	-0.06	-1.13
9. I am not particularly good at making other people like me	4.39	1.64	0.18	0.77	-0.24	-0.75
10. I'm not always the person I appear to be	3.48	1.93	0.25	0.77	0.21	-1.22
11. I would not change my opinions (or the way I do things) in order to please someone or win their favor	2.98	1.70	0.17	0.77	0.57	-0.73
12. I have considered being an entertainer	2.85	2.04	0.35	0.76	0.80	-0.76
13. I have never been good at games like charades or improvisational acting	4.28	1.78	0.34	0.76	-0.30	-0.91
14. I have trouble changing my behavior to suit different people and different situations.	3.96	1.63	0.42	0.75	-0.02	-0.89
15. At a party I let others keep the jokes and stories going	3.24	1.67	0.38	0.76	0.41	-0.72
16. I feel a bit awkward in public and do not show up quite as well as I should.	4.07	1.81	0.25	0.77	-0.07	-1.07
17. Lean look anyone in the eye and tell a lie with a straight face (if for a right end)	3.30	1.94	0.40	0.75	0.39	-1.11
18. I may deceive people by being friendly when I really dislike them	2.34	1.63	0.33	0.76	1.27	0.74
Total scale α=0.77						

Exploratory Factor Analysis

The analysis displayed in Table 3 indicates that there is no consistency in the number of factors to retain. Given this disparity in the number of factors to be considered for a stable factor structure, three alternatives were analysed from a statistical and semantic point of view (two, three and four factors).

Whereas the retention of the factors to be considered for the factor model should combine both the statistical and the semantic point of view – that is, the meaning of each of the factors – we began to analyse and identify the constructs that supported the interpretation of the factors for the four-factor solution. This was followed by the analysis of the semantic content of the aggregated items according to the three-factor solution. In order to do this, the extraction was reduced to three factors. The first factor was interpreted as the propensity for behavioral expressiveness in contact situations with

the public, corresponding to behavioral regulation in social situations; the second as the propensity for general behavioral inhibition in social situations; and the third as the likelihood to adopt attitudes and expression of ideas consistent with what is socially expected. The option for a factorial solution of three factors indicates that item 4 ("I can make impromptu speeches even on topics about which I have almost no information") with saturation percentages exceeding 18% on two factors simultaneously, gives a clear indication that this item should not be considered in the range reduction process. The percentage of variance displayed by this model of three factors is 44.3%, if we consider the exclusion of item 4. Although the three-factor solution is an interpretable solution and can explain more than 44% of the variance model, it presents a strong limitation in the level of reliability of the third dimension. While subscales concerning factors one and two have acceptable Cronbach's alphas (0.79 and 0.68 respectively), the subscale on the third factor has an alpha of 0.54 without any indication of increase with the removal of any other item, invalidating the future use of this subscale given the low reliability.

Table 3
Number of factors to retain according different criteria on EFA

Retention factor criterion	Number of factors to retain
(1) Kaiser rule	4
(2) Cattel´s scree test	3
(3) Velicer`s MAP	2
(4) Horn´s Parallel Analysis	2

In the alternative solution of the two remaining factors in the EFA, the first two groups of items of the three--factor solution were used and the items that constituted the third dimension of the three-factor solution and those saturated by more than 10% in the two factors were withdrawn. After withdrawing the items that saturated the third dimension, a new EFA was made with the forced extraction of two factors and the items were subjected to Rasch's Item Response Theory (IRT) method for each of the dimensions obtained. Items 12 and 13 were removed. Item 12 of factor 1 had an infit (MNSQ=1.48) and outfit (MNSQ=1.41) with very close values and was thus considered to be moderately maladjustment (1.5) as specified by Linacre (2006); we can consider that the standard responses of subjects to this item is not set. Although item 13 presented more favourable adjustment indices on the subscale of the factor 2 (infit MNSQ=1.26; outfit MNSQ=1.25), it was decided to remove it because of the reliability coefficient, as virtually no change was observed with its exclusion. A new EFA without items 12 and 13 – and without item 10 to present a saturation higher than 0.33 in two factors – stabilized the factor structure of two factors, explaining 53% of the variance model (KMO=0.77), as shown in Table 4.

Table 4
Factorial matrix after orthogonal rotation (Varimax)

Items	Factor 1	Factor 2
Item 5	0.77	
Item 17	0.73	
Item 18	0.73	
Item 8	0.70	
Item 6	0.69	
Item 16		0.77
Item 7		0.72
Item 9		0.67
Item 15		0.67

The four factor solution does not allow a clear and distinct interpretation of factors, showing the brittleness of the Kaiser rule as a criterion for the identification and interpretation of the extracted factors (Courtney, 2013). The Velicer MAP factors retention criteria and Horn parallel analysis appear to be methods which lead to a more stable solution as shown in Figure 1 (in Appendix A).

Confirmatory Factor Analysis

The structural model of two factors (see Figure 2 in Appendix B) was tested by using CFA with the second sample responses. The results confirm the bi-factor model as the model with better adjustment to the sample considered (see Table 5).

The analysis of response frequency of the rating scale for the two subscales was performed using 7 points (1 – Totally Untrue to 7 – Totally True), by means of the Winsteps structure categories diagnostic procedure. The calibration structure or step measure was the estimation of a parameter of the Rasch model (Rasch-Andrich thresholds), which corresponded to the point at which adjacent categories had equal probability and their response curves intersected each other (Linacre, 2006). It was found that for one factor subscale – Public Acting – five items' values, data relating to the calibration structure, had a cluttering effect on categories 3 and 4 which can be seen in the left graph of Figure 3 (in Appendix C). The cluttering category in the rating scale may be due to the fact that the evaluators were asked to reply on a scale with more categories than they could discriminate between (Linacre, 2006). This result was not the case regarding the Public Avoidance subscale (factor two).

Table 5
CFA adjustment indices for different models

Models	χ^2(gl)	CFI	GFI	RMSEA	AIC
One-factor	5.29	0.57	0.79	0.10	786.73
Correlated two-factors	2.54	0.93	0.96	0.06	104.16
Bifactor	1.51	0.98	0.99	0.04	81.26
Correlated three-factors	3.20	0.79	0.90	0.07	445.32

Discussion and Conclusions

Self-monitoring can be defined as the ability to control or modify self-presentation depending on the social situation (Snyder, 1974). The social effectiveness of individuals with high self-monitoring is based on high skill levels, sensitivity, and the decoding of emotional expressions of others (e.g., facial expressions, gestures, etc.), allowing others to infer affective states (Funder & Harris, 1986; Gangestad & Snyder, 2000) and personality traits (Costanzo & Archer, 1989). These skills enable them to enhance, reduce, or counteract an internal emotional state in order to fit with the social context—in other words, they present different "selves" in different social situations. On the contrary, individuals with low self-monitoring have only one self that they present consistently in different social situations.

Given the difficulty of consensus in the implementation of self-monitoring and its importance in understanding social behaviour and work, this study aimed to contribute to understanding of the internal structure of the self-monitoring construct and to the adaptation of a SMS for a Portuguese sample. The results point to a two-dimensional structure: Public Acting and Public Avoidance, with a reduction to 9 items, excluding a third dimension present in other studies (Gana & Brechenmacher, 2001). Public acting presumes that the individual is aware of how others perceive their actions and, often, adjust them in order to create the desired public appearance Public Avoidance corresponds to a behavioral dimension of the introversion extreme of Extraversion-Introversion. The Portuguese version used a rating scale of 7 points, contrary to the revised version of the Gangestad and Snyder (1985) Self-Monitoring Scale in which the answer is given in dichotomous form. Rating scale format displays higher internal consistency than the dichotomous format (Day et al., 2002). The use of Rasch's rating scale model in this personality questionnaire based on items with Likert-type responses aimed to verify the existence of nonmodal response categories, and the category information analysed through the scale's structure as indices (Rasch-Andrich thresholds) allowed us to consider the possibility of reducing the rating scale amplitude to less than seven points, which could be investigated in further studies.

The reduction of items makes the scale very flexible and economical, facilitating its application in both academic and organizational situations. Furthermore, the use of a reduced scale for the assessment of personality has become increasingly important (Bártolo-Ribeiro & Aguiar, 2008). However, it is noteworthy that the reduction to 9 items with the exclusion of one dimension is not a function of its semantic character, but for reasons of statistical order. The excluded items (i.e., item 3: "One can only argue for ideas which I already believe," and item 11: "I would not change my opinions (or the way I do things) in order to please someone or win their favour") are related to the adoption and expression of attitudes and opinions that imply cognitive dissonance. Also, by statistical guidance, the bifactor structural model, with better fit to the data, assumes the variance of the trait indicators as a result of both general and group sources of variance for the understanding psychological constructs and their measurement, which can create the

need to score subscales (Reise, 2012). Although the theory of self-monitoring (Snyder, 1974) predicts this cognitive dimension of behavioral malleability, it is possible to hypothesize that it is an independent aspect of behavioral expression in social contexts. In our view, expressive behavioral aspects (emotions, etc.) may involve less dissonance and are more automatic than when viewed in the context of confrontation with others, as happens with opinions, expression of attitudes, etc.

Attitudes adjusted to others, but contrary to the Self, are less accessible and therefore imply more time or a low credibility perception of the sender. In other words, being an actor, a mimic, or being political means having motivation and experience and expressing the emotions of those characteristics (Snyder, 1974) without changing one's own way of thinking, feeling, and acting. On the other hand, in our view, the excluded dimension items show that the behaviours that reflect greater control by the other, such as imitating attitudes and behaviours (e.g., item 1: "I find it hard to imitate the behaviour of other people"), contradicts the person's own perception of their ability to regulate and to control themselves. In short, it is possible to hypothesize that social contamination based on personality aspects (e.g., extroversion, social needs) is different from the expression of attitudes or mere imitation involving a more complex and less heuristic change process. The exclusion of this dimension can also be interpreted according to cultural differences. Trait Theory postulates that individuals' attributes are relatively stable and predict their behavior over time and in different situations (Johnson, 1997; Kenrick & Funder, 1988).

McCrae and Costa (1996), for example, consider that the Big Five personality traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience) are universal and partly hereditary and should therefore predict relevant behaviors in all cultures (Church et al., 2008). However, some cultural psychologists (e.g., Markus & Kitayama, 1998; Shweder, 1991) have questioned the universality and predictive value of personality traits across cultures, emphasizing the socially constructed nature of personality (Church et al., 2008). For example, Markus and Kitayama (1998) consider that there are differences in the conception of personality between collectivist and individualistic cultures. In fact, some studies have shown that individualistic cultures exhibit higher self-monitoring than collectivistic cultures (e.g., Gudykunst et al., 1989). Considering the different studies of adaptation of the self-monitoring scale carried out in other countries (e.g., Spain, France), it is possible to establish a parallel between cultural characteristics and the different dimensions of the scale. According to Hofstede (2001), Spain and France are more individualistic countries than Portugal, with index scores of 51 and 71, respectively, on the individualism dimension, which contrasts with an index of 27 in Portugal. In both validations (Spanish and French), the authors identified the Other-Directedness dimension.

However, it is possible to verify that there are differences in the number of dimensions obtained, either in the Spanish adaptation (Paredes et al., 2015) that identified two dimensions, or in the French adaptation (Ghana & Brechenmacher, 2001) that counted three dimensions. Gudykunst and colleagues (1989), for example, contend that the one-dimensional structure of the scale fits better to collectivist cultures. That is, each author adopts a different perspective regarding the same instrument. It is thus verified that these differences reinforce the variation and the instability existing in this instrument, even among similar cultures (e.g., Church et al., 2006; 2008), thus not allowing a consensus regarding the dimensions that make up the construct.

In future studies, and for more rigorous support of the metric qualities of the instrument and the conceptualization of the construct, other measures that allow other metric analyses such as concurrent and discriminant validity should be considered. Given the instability of this measure (Barreiros, 2012), non-control of response conditions (i.e., individual application and collective application) may be pointed out as a limitation of the study. Also, noteworthy is the gender imbalance of the sample, since male participants prevailed. Future studies should look for more balanced samples for testing this instrument, since some investigations have shown that women respond more to behavioral expectations than men, have greater emotional expressiveness and a greater ability to decode the emotions of others (Boyatzis et al., 1993; Hall, 1984). On the other hand, a meta-analysis by Day and colleagues (2002) suggests that men tend to contain their true feelings in interpersonal contexts. Future studies should also include a more in-depth analysis of population characteristics (e.g., socioeconomic status) with a view to possible comparative studies regarding sociodemographic data (measurement invariance analysis). Additionally, the absence of other measures to test other types of validities can be seen as a limitation. Looking ahead, it will be essential to analyse the conceptual structure of self-monitoring by considering its relationship with social cognition, in order to clarify whether self-monitoring is associated with automatic imitation processes (e.g., mimicry) and empathy or provides cognitive processes of attitudinal adjustment.

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Authors' contributions

We declare that all authors participated in the preparation of the manuscript.

Availability of data and materials

All data and syntax generated and analyzed during this research will be treated with complete confidentiality due to the Ethics Committee for Research in Human Beings requirements. However, the dataset and syntax that support the conclusions of this article are available upon reasonable request to the principal author of the study.

Competing interests

The authors declare that there are no conflicts of interest.

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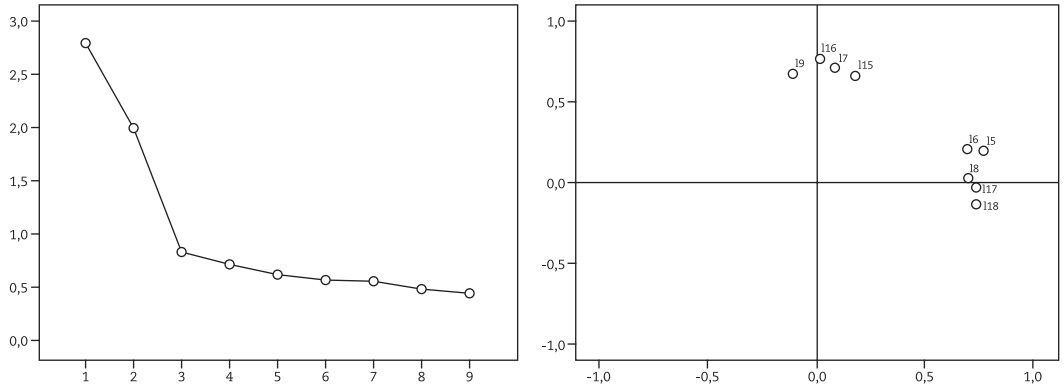
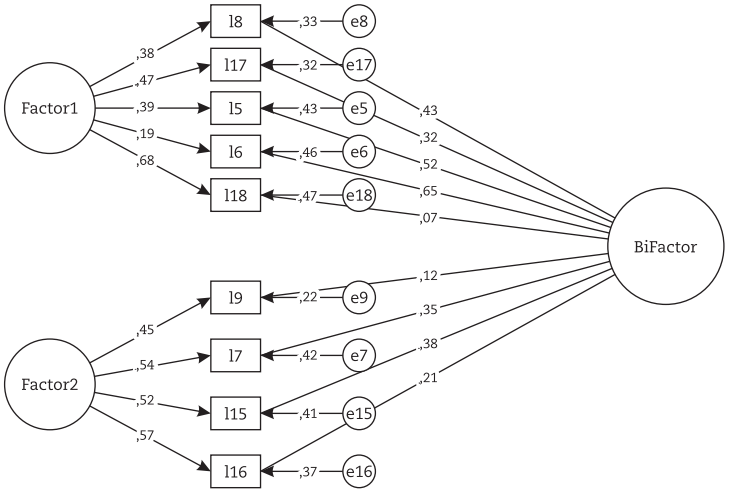
Appendix A

Scree plot (left) and component plot in rotated space (right) of the Self-Monitoring Scale: saturation coefficients of the items in the extracted component (principal components analysis extraction followed by Varimax rotation)

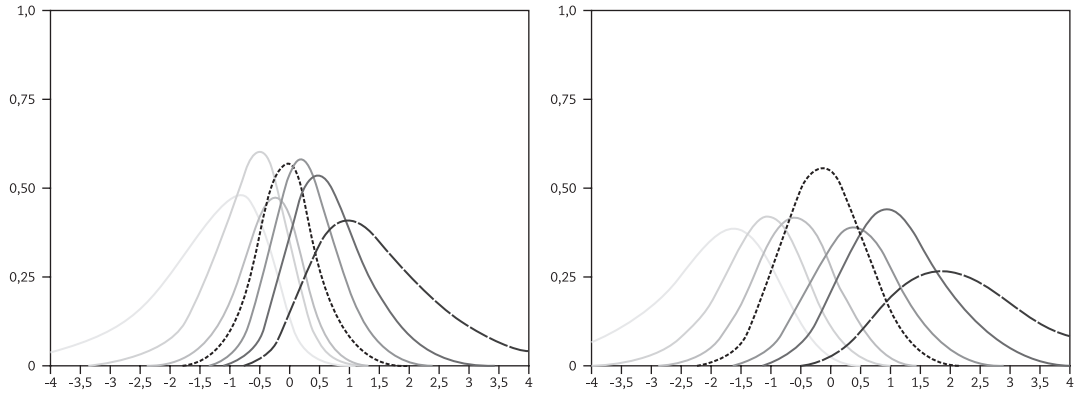


Appendix B

CFA bi-factor model of the Self-Monitoring Scale



Appendix C
Category information for the two subscales



Appendix D
Items of the Portuguese version of reduce version of Self-Monitoring Scale (original items of English version are in italics in parentheses)

Public Acting	1	Suponho que por vezes dou show para impressionar os outros. *(I guess I put on a show to impress or entertain others).*
	2	Provavelmente daria um bom ator. *(I would probably make a good actor).*
	3	Posso ser "várias pessoas" em função das diferentes situações e pessoas com quem interajo. *(In different situations and with different people, I often act like very different persons).*
	4	Se for para um bom fim, posso olhar qualquer pessoa nos olhos e dizer uma mentira como se nada fosse. *(I can look anyone in the eye and tell a lie with a straight face (if for a right end)).*
	5	Posso ter enganado algumas pessoas ao mostrar-me amiga, quando na realidade não gostava delas. *(I may deceive people by being friendly when I dislike them).*
Public Avoidance	6	Num grupo de pessoas raramente sou o centro das atenções. *(In a group of people, I am rarely the center of attention).*
	7	Não sou particularmente bom em fazer com que os outros gostem de mim. *(I am not particularly good at making other people like me).*
	8	Numa festa, deixo que sejam os outros a contarem as anedotas e as histórias. *(At a party, I let others keep the jokes and stories going).*
	9	Sinto-me pouco à-vontade em público e não me expresso da forma como deveria. *(I feel a bit awkward in public and do not show up quite as well as I should).*

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