

## PSYCHOMETRICS

## Validation of the Maternal and Partner Sex During Pregnancy Scales (MSP/PSP) in Portugal: Assessing Dyadic Interdependence and Associations with Sexual Behaviors

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## ABSTRACT

**Background:** The Maternal and Partner Sex During Pregnancy Scales (MSP/PSP) are self-report measures of expectant couples' attitudes towards sex during pregnancy.

**Aim:** This study aimed to examine dyadic non-independence of MSP/PSP scores in a sample of expectant couples, while providing an evaluation of factor structure, validity, and reliability of the Portuguese versions of the MSP/PSP. The association between partners' attitudes and frequency of sexual behaviors was also examined.

**Methods:** A total of 189 expectant couples completed a survey that included a sociodemographic questionnaire, the MSP/PSP, frequency of sexual behaviors, as well as validated measures of attitudes to sex, sexual function, sexual satisfaction, depression, and perceived social support.

**Outcomes:** Dyadic interdependence was tested via Pearson correlation between MSP/PSP scores; between-dyads variability was tested via intraclass correlation of the unconditional model including only MSP/PSP scores using a multi-level model. Associations between attitudes and sexual behavior were tested using regression analysis (between-dyads outcomes) or APIM (mixed outcomes).

Factor structure, internal consistency, and validity (convergent, discriminant, and concurrent) of the Portuguese versions of the scales were assessed.

**Results:** MSP/PSP scores were interdependent within-dyads. Male partners presented significantly more positive attitudes towards sex during pregnancy than pregnant women. Attitudes were linked to indices of sexual well-being for both partners (sexual functioning, sexual satisfaction) and, for both partners, more positive attitudes were associated with higher frequencies of most partnered sexual behaviors. The Portuguese MSP/PSP scales showed good factor structure, and good to excellent indices of reliability and validity.

**Clinical Implications:** The Portuguese MSP/PSP is adequate for use in couples. The scales can be used to screen partners with negative attitudes towards sex during pregnancy and evaluate how these attitudes relate to intra- and inter-individual sexual well-being during pregnancy.

**Strengths & Limitations:** A strength of this study is the inclusion of both expectant partners and the use of dyadic analysis. Couples who participated in the study were all in mixed-gender/sex relationships, although this was not defined as an inclusion criterion. Future studies should use the MSP/PSP in more diverse samples in order to further determine how the scale performs for couples with different characteristics.

**Conclusion:** Scores in the MSP/PSP are interdependent between mixed-sex/gender expectant couple members. More positive attitudes towards sex during pregnancy are linked to higher frequencies of partnered sexual behaviors and to both partners' greater sexual well-being. **Tavares Inês M., Heiman Julia R., Rosen Natalie O., et al.**

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**Key Words:** Dyadic Interdependence; Attitudes Toward Sex; Couples; Pregnancy; Sexual Behavior; Psychometric Properties; Portuguese Version

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## INTRODUCTION

During pregnancy, pregnant individuals and their partners are faced with a wide range of biological, psychological, and sociocultural changes that require their adaptation. One of the dimensions that needs couples' adjustment while pregnant is that of their sexual experiences and a critical factor that may be related to the observed changes in expectant couples' sexual well-being during early- and mid-pregnancy is the presence of negative attitudes toward having sex while pregnant. Prior studies have found that expectant couples who respond with positive affect to sexuality during pregnancy present indices of better adjustment postpartum (eg, women are more likely to breastfeed, men are more likely to be present during birth), including sexual adjustment (ie, greater sexual interest, earlier resumption of intercourse).<sup>1</sup> Moreover, it is known that partners' well-being influence that of the other partner's in a reciprocal manner, a process designated as dyadic interdependence.<sup>2</sup> It is thus critical that studies take both expectant partners' attitudes to sex into account when examining relational processes such as those involved in couples' adjustment during pregnancy.

Pregnant women and their partners commonly refer several concerns about sex during pregnancy. Such concerns are often related to a misunderstanding about what constitutes safe sexual practices and the belief that vaginal intercourse may induce negative obstetric outcomes (eg, preterm labor, miscarriage, harm to the fetus, infection). Although these concerns constitute common reasons for couples to abstain from sexual activity during pregnancy,<sup>3–7</sup> for most couples — those without specific medical conditions — these concerns are not substantiated by medical reasons and are hence unfounded.<sup>3,5,8–10</sup> Clinicians and researchers should be able to identify those with negative attitudes and misconceptions about having sex during pregnancy, since they might be at heightened risk of experiencing lower sexual well-being.

### Assessing Maternal and Paternal Attitudes Towards Sex During Pregnancy

Negative attitudes towards sex during pregnancy are characterized by negative beliefs (eg, having sex during pregnancy might cause pregnancy loss) and negative affect (eg, feeling anxious) about having sex during pregnancy.<sup>7</sup> To assess these constructs, Jawed-Wessel and colleagues have designed the Maternal Sex During Pregnancy (MSP) and Partner Sex During Pregnancy (PSP). These self-report measures, originally validated in English and developed based on theory-based approaches of behavior change, allow the assessment of the pregnant individual's (MSP) as well as their partner's (PSP) attitudes relative to sex during pregnancy. The MSP includes 6 items and the PSP includes 8 items, and both versions assess cognitive (eg, "Having sex can cause a miscarriage") as well as affective (eg, "I feel anxious about having sex because of the pregnancy") aspects of an individual's experiences. Both scales were shown to have a unidimensional structure.

When compared with other measures that have been used to assess attitudes towards sex during pregnancy, the combined use of the MSP and the PSP presents several advantages. First, studies tend to collect data only from the pregnant women, but not considering dyadic interactions within the couple,<sup>4</sup> although one's beliefs and experiences are likely to be influenced by, and are interdependent with, those of their sexual partners.<sup>11,12</sup> A measure that permits the assessment of both couple members is therefore valuable. Also, most studies infer attitudes relying only on ad-hoc questionnaires or a single-item question<sup>13–14</sup> generally asking participants the extent to which they believe sexual intercourse will harm the pregnancy,<sup>13–15</sup> ignoring other relevant concerns about sex during pregnancy. The Attitudes to Sex subscale of the Maternal/Paternal Adjustment and Maternal/Paternal Attitude During Pregnancy Questionnaire (MAMA-AS/PAPA-AS)<sup>16</sup> is a measure that assesses attitudes to sex during pregnancy relying on multiple items, but evaluates broad constructs such as desire and arousal in a specific time-frame (ie, last month). Hence, this measure mostly reflects expectant couples' experiences and feelings *during* pregnancy (eg, "Have you wanted to have sexual intercourse?"; "Have you felt you were easily aroused sexually?") instead of assessing the influence that pregnancy *has had* on their sexual experiences.

The MSP/PSP addresses these limitations by including multiple items assessing relevant attitudes regarding sex during pregnancy and comprising 2 versions that permit the assessment of the pregnant person's and their partner's attitudes. A general assessment of one's attitude can be obtained using the MSP/PSP and the individual examination of each item can prove helpful to understand specific areas of difficulty for each partner. The MSP/PSP were designed to be gender/sex-neutral and can therefore be used with couples of diverse genders/sexual orientations. Although attitudes are often related to behavior and are likely to shape our experiences and preferences,<sup>17–19</sup> prior studies have mostly paid attention to the association between attitudes and couples' frequency of vaginal intercourse, but less so to other indices of sexual well-being.

### Current Study

The goal of this study was to extend previous research by examining interdependence between couple member's attitudes towards sex during pregnancy and to examine whether MSP/PSP scores are associated with couples' indices of sexual well-being beyond vaginal intercourse. As such, the aims of the present study were threefold: (i) to validate the MSP/PSP in a sample of Portuguese expectant couples; (ii) to test for dyadic non-independence between couple member's scores in the MSP/PSP; and (3) to assess the degree to which MSP/PSP scores are associated with both partners' several sexual behavioral self-reports (ie, frequency of sexual behavior) during pregnancy. Using a dyadic approach, we tested for actor (ie, association between own attitude and own frequency of sexual behaviors) and partner (ie, association

between own attitude and partners' frequency of sexual behaviors) effects. Few prior studies have analyzed these associations at a dyadic level, preventing us from posing specific hypotheses regarding partner effects. Still, given the link between expectant couples' attitudes and behavior during pregnancy<sup>11</sup> and the central role of fear that vaginal penetration might induce negative obstetric outcomes<sup>4</sup>, we anticipated that more positive attitudes towards sex during pregnancy would be associated with higher frequencies of vaginal penetrative sexual behaviors but would not be associated with sexual behaviors that do not involve vaginal penetration (eg, caressing, anal penetration). The screening and identification of partners with negative attitudes towards having sex while pregnant can contribute to a more comprehensive understanding of both partners' adjustment to this period and to how sexual adjustment impacts partners' overall adjustment. This should better inform the development of effective clinical interventions interested in an early identification of preventable sexual changes.

## MATERIALS AND METHODS

### Participants

Couples ( $n = 189$ ) were recruited at regularly scheduled clinical appointments to gynecologists in an obstetrics outpatient unit, and through advertisements in newspapers, online/social media advertisements, and study flyers posted in the community (ie, pregnancy-related services, clinic and hospital bulletin boards). Eighty-five percent of the study sample was recruited at the obstetrics outpatient unit, 12% recruited through advertisements, and 3% by word of mouth. To be eligible, both couple members were required to be 18 years of age or older, able to read and write in Portuguese, in a committed relationship with each other for at least 6 months, and both members of the couple had to agree to participate. One partner had to be currently pregnant with their first child (ie, had not previously given birth or had any other biological children) and this should be a singleton pregnancy. Exclusion criteria included suffering from severe clinical conditions (ie, psychiatric or medical pathology likely to interfere with the pregnancy). Because we aimed to extend the applicability of the MSP/PSP to couples who were not exclusively in the first few weeks of their pregnancy (as was the case with the original MSP/PSP validation study), we included couples who were in the first or second trimesters of pregnancy. As per the original validation of the MSP/PSP, only first-time parents were included, given that attitudes towards having sex during pregnancy are likely to be different for individuals who have had prior experience with sex during pregnancy. Eligibility criteria were determined using a brief screening questionnaire before the beginning of the survey.

### Procedure

The present research received previous approval from the Faculty of Psychology of the University of Porto's and the Centro

Materno Infantil do Norte's institutional review boards and was part of a larger study examining factors associated with couples' sexual well-being during the transition to parenthood. Recruitment occurred from June 2018 to March 2020. Participants recruited through community/media advertisements completed all the materials online. Participants enrolled in the obstetrics outpatient unit were recruited through gynecologists' referral. After their gynecological appointment, potentially eligible couples were invited to speak directly with the study coordinator present on-site, who introduced them to the study, explained the aims and the procedures, and provided them with a study flyer. Participants were asked to complete the survey online, which was sent to women and partners separately to their own email addresses. Upon following the URL link, participants provided informed consent online before beginning the survey. Both couple members were instructed to complete their surveys independently from each other and within 4 weeks of each other. After participation, each couple was compensated with 10€ in gift cards and received a list of online resources related to sexuality and relationships during the transition to parenthood.

### Measures

*Sociodemographics.* Information on participants' age, education, sexual orientation, relationship status and duration, and pregnancy/obstetric history (women only) were collected. Each partner responded to these items individually.

*Edinburgh Postnatal Depression Scale (EPDS).* The EPDS<sup>20</sup> is a valid and reliable screening self-report measure of depressive symptoms during and after pregnancy. The total score of the EPDS can be used as a unidimensional assessment of depressive symptoms but 3 subdimensions (depression, anhedonia, anxiety) can also be calculated<sup>21</sup>. The intensity of depressive symptoms within the previous 7 days (eg, "I have felt sad or miserable") is assessed using 10 items scored on a four-point rating scale (eg, 0 = *yes, most of the time* to 3 = *no, not at all*). Total scores can range from 0 to 30 with higher scores indicating greater intensity of depressive symptoms. The version used in this study is based on the Portuguese population adaptation for both women and men<sup>22,23</sup> which demonstrates good internal consistency. In the present sample, Cronbach's alpha coefficient was .85 for women and .80 for men.

*Female Sexual Function Index (FSFI).* Women's sexual functioning across 6 domains (desire, arousal, lubrication, orgasm, satisfaction, and pain) was assessed using the well-validated 19-item FSFI.<sup>24,25</sup> Total scores range from 2 to 36 with higher scores indicating better sexual function. Based on current recommendations,<sup>26</sup> women who reported no sexual activity ( $n = 22$ ) were not included for analyses. The FSFI demonstrated high internal consistency ( $\alpha = 0.96$ ) in the present study.

*Frequency of Sexual Activities.* Participants were asked about how often in the past 4 weeks they practiced each of several solo or partnered sexual activities using 9 items: vaginal penetration,

solo masturbation, manual stimulation by partner, mutual masturbation, oral sex, kissing, caressing, anal penetration, and use of sex toys. Answers were assessed on a six-point rating scale (1 = *never* to 6 = *at least once a day*), wherein higher scores indicate higher frequency.

**Global Measure of Sexual Satisfaction (GMSEX).** Sexual satisfaction was assessed using the well-validated 5-item GMSEX, a valid and reliable measure of sexual satisfaction in relationships<sup>27,28</sup>. Scores range from 5 to 35, with higher scores indicating greater sexual satisfaction. Reliability in the current study was excellent ( $\alpha_{\text{women}} = 0.96$ ,  $\alpha_{\text{men}} = 0.97$ ).

**International Index of Erectile Function (IIEF).** The well-validated 15-item IIEF<sup>29,30</sup> was used to measure men's sexual function across 5 domains (sexual desire, erectile function, orgasmic function, intercourse satisfaction, and overall satisfaction). Total scores range from 5 to 75 with higher scores indicating better sexual function. Men who reported no sexual activity ( $n = 26$ ) were not included for analyses. The IIEF demonstrated high internal consistency ( $\alpha = 0.95$ ) for this sample.

**Maternal and Partner Sex During Pregnancy Scales (MSP/PSP).** The MSP and the PSP<sup>7</sup> are self-report, unidimensional tools that assess attitudes of pregnant women and their sexual partners toward sex during pregnancy. Respondents are asked to indicate their experiences, thoughts and feelings about their sex life (eg, "It is impossible to have an exciting sex life because of the pregnancy") on 6 (MSP) and 8 items (PSP) scored on a six-point Likert-type scale ranging from 1 (*strongly agree*) to 6 (*strongly disagree*). Items on each scale are averaged to obtain a global attitude score. Total scores can range from 1 to 6, with higher scores indicating a more positive sexual attitude toward having sex during pregnancy. The original scales demonstrate good construct validity and high reliability ( $\alpha_{\text{MSP}} = 0.89$ ;  $\alpha_{\text{PSP}} = 0.91$ ). In the present sample, Cronbach's alpha coefficient was 0.71 for the MSP and 0.81 for the PSP. After permission for translation and use from the original authors, the Portuguese version of the MSP and the PSP was produced. All items were first translated to Portuguese by 2 bilingual researchers and then back-translated to English by an independent mother-tongue language expert. The English translation was compared with the original questionnaire. The 3 translators discussed the backward translation and consensus was reached through discussion. Finally, the draft version was tested with 5 expectant couples not participating in the study. No additional revisions were deemed necessary, resulting in the final Portuguese version of the MSP/PSP.

**Maternal/Paternal Adjustment and Maternal/Paternal Attitudes Questionnaire (MAMA/PAPA).** The well-validated MAMA and PAPA scales<sup>16,31,32</sup> measure expectant mothers' and fathers' adjustment and attitudes during pregnancy and after delivery in 5 different subscales. Only the Attitudes to Sex subscale (MAMA-AS/PAPA-AS) was relevant to this study. In this 11-item subscale, participants are asked to report how often they have experienced certain feelings during or about sexual activity in the past month. Scores range from 11 to 44 with higher scores

indicating higher adjustment and more positive attitudes towards sex during pregnancy. Reliability in the current study was also high ( $\alpha_{\text{MAMA-AS}} = 0.81$ ;  $\alpha_{\text{PAPA-AS}} = 0.75$ ).

**Multidimensional Scale of Perceived Social Support (MSPSS).** Perceived social support received from 3 sources (family, friends, and significant other) was assessed using the well-validated 12-item MSPSS.<sup>33,34</sup> Total scores range from 12 to 72 with higher scores indicating higher perceived social support. Reliability in the current study was high for the total scale ( $\alpha = 0.91$  for both women and men) and for the subscales (Family:  $\alpha_{\text{women}} = 0.94$ ,  $\alpha_{\text{men}} = 0.93$ ; Friends:  $\alpha_{\text{women}} = 0.95$ ,  $\alpha_{\text{men}} = 0.94$ ; and Significant Other:  $\alpha_{\text{women}} = 0.94$ ,  $\alpha_{\text{men}} = 0.91$ ).

## Data Analysis

To examine the psychometric characteristics of the MSP and the PSP, we analyzed (i) factor structure, (ii) internal consistency, and (iii) construct and criterion validity. We assessed (1) factor structure of the scale using confirmatory factor analysis (CFA). To analyze model goodness of fit, we computed and assessed several indices according to recommendations.<sup>35,36</sup> A good model fit was considered if evidenced by a comparative fit index (CFI) and Tucker–Lewis Index (TLI) of at least 0.95, a Root Mean Square Error of Approximation (RMSEA) of .06 or less, and a Standardized Root Mean Square Residual (SRMR) of 0.08 or less; however, less stringent criteria of a reasonable fit (eg,  $\text{RMSEA} \leq 0.08$ ,  $\text{CFI} \geq 0.90$ , and  $\text{TLI} \geq 0.90$ ) were also considered.<sup>37</sup> To examine (ii) internal consistency, we performed analyses of Cronbach's alpha coefficient, item–total correlation, and mean–item correlation. Good internal consistency was assessed following Field's guidelines<sup>38</sup> Cronbach's alpha coefficients higher than .70, item–total correlations over .30, and mean–item correlations higher than 0.15. To examine (iii) construct and criterion validity, we calculated Pearson correlations between MSP/PSP and other measures.

Within dyads non-independence of MSP and PSP scores was determined through Pearson correlation<sup>2</sup>. Between dyads variability in attitude scores was tested via the Intraclass correlation (ICC) of the unconditional model including only MSP/PSP scores using a multi-level model, where partners were nested within couples<sup>2</sup>. Finally, we examined attitudes towards sex during pregnancy as predictors of the frequency of diverse sexual behaviors. For between-dyads outcomes (ie, same frequency for both couple members) – such as vaginal penetration, anal penetration, oral sex, mutual masturbation, kissing, and caressing –, we tested frequency of sexual behaviors as a couple-level variable (average between both partners' scores) via regression analysis. For mixed outcomes (ie, frequency of sexual behavior varies both between and within dyads) – such as manual stimulation by the partner, solo masturbation, and use of sex toys – we estimated actor-partner interdependence models (APIM) via multi-level modelling, where partners were nested within couples.<sup>2</sup> MSP and PSP were used as predictors centered at the grand mean.

Statistical analyzes were performed using SPSS v26.0 except for CFA which was performed using MPlus v8.0.

## RESULTS

The final sample comprised 189 expectant couples who ranged in age from 19 to 47 years old (women: *Mdn* = 30, *IQR* = 27–33; men: *Mdn* = 32, *IQR* = 28–35). A total of 31 participants were excluded for failing to meet the selection criteria (*n* = 27 women; *n* = 4 partners). Of the 226 couples that met eligibility criteria and initially agreed to participate, 15 couples had only 1 partner responding to the questionnaire, 5 couples had missing data for 1 partner representing more than 20% of a measure, and 17 couples withdrew before completing the survey,

**Table 1.** Participants' sociodemographic characteristics (*N* = 378, 189 women)

	Women		Men	
	Mdn or <i>n</i>	IQR or %	Mdn or <i>n</i>	IQR or %
Age (years)	30	27–33	32	28–35
Education (years)				
≤9	13	6.9%	25	13.4%
10–12	58	30.7%	83	44.0%
>12	118	62.4%	81	42.6%
Professional status				
Employed	155	82%	175	92.6%
Unemployed	28	14.8%	9	4.8%
Student	6	3.2%	5	2.6%
Self-identified sexual orientation				
Exclusively heterosexual	173	91.6%	179	94.8%
Predominantly heterosexual	16	8.4%	8	4.2%
Bisexual	0	0%	2	1%
Other	0	0%	0	0%
Relationship status				
Married	77	40.8%	—	—
Common law	56	29.6%	—	—
Dating	56	29.6%	—	—
Living with partner			—	—
Yes	172	91.0%	—	—
No	17	9.0%	—	—
Relationship length (months)				
84	44–126	—	—	
Weeks pregnant				
20	14–23	—	—	
7–12	85	45.0%	—	—
13–24	104	55.0%	—	—
Planned pregnancy				
Yes	154	81.5%	—	—
No	35	18.5%	—	—
High-risk pregnancy				
Yes	5	2.6%	—	—
No	184	97.4%	—	—

resulting in a final sample size of 189 (84%) couples. All couples were mixed-gender/sex, despite the study being advertised as inclusive of couples of all gender/sex. Sociodemographic characteristics of the sample are presented in Table 1. Self-reported frequencies for partnered and solo sexual behaviors are depicted in Table 2.

## MSP/PSP Factor Structure

Results of the CFA indicated an excellent fit of the unifactorial model for the MSP,  $\chi^2[9] = 7.46$ ,  $P = .49$ , CFI = 1.00, TLI = 1.00, RMSEA = .00, SRMR = .03. Results showed an overall good fit of the unifactorial model for the PSP,  $\chi^2[20] = 51.66$ ,  $P < .001$ , CFI = 0.93, TLI = 0.90, RMSEA = 0.09, SRMR = 0.05<sup>36,37</sup>. The modification indices suggested an improvement in model fit if the errors of PSP items 3 and 5 were allowed to covary (MI = 10.49; both items referred to finding previously exciting aspects of sexual activity less arousing due to the pregnancy). Including this error covariance improved fit significantly,  $\chi^2[19] = 41.43$ ,  $P = .003$ , CFI = 0.95, TLI = 0.93, RMSEA = 0.08, SRMR = 0.04. Factor loadings ranged from 0.33 to 0.79 for the MSP and from 0.30 to 0.82 for the PSP (see Figure 1a–b).

## MSP/PSP Item Analysis and Internal Consistency

Item analysis for the MSP and PSP is presented in Table 3. Both scales demonstrated good internal consistency ( $\alpha_{\text{MSP}} = 0.71$  and  $\alpha_{\text{PSP}} = 0.81$ ). All items presented an item–total correlation  $\geq 0.30$  and mean–item correlations were  $\geq 0.15$  for both scales (see Table 3).

## MSP/PSP Validity

The MSP and the PSP showed moderate and positive correlations with attitudes to sex as measured with the MAMA-AS and PAPA-AS, respectively (see Table 4), indicating good convergent validity. The MSP/PSP also showed weak to non-significant correlations with both depression (EPDS) and perceived social support (MSPSS), demonstrating good discriminant validity. More positive attitudes towards sex during pregnancy were associated with one's own higher sexual function (IIEF/FSFI) and higher sexual satisfaction (GMSEX), showing good concurrent validity (see Table 5).

## Dyadic Interdependence and Association with Sexual Behaviors

As expected, partners' attitude scores were significantly and moderately correlated ( $r = 0.47$ ,  $P < .01$ ), indicating within-dyads interdependence<sup>2</sup>. The unconditional model revealed that 41.4% of the variability in attitude scores was at a between-dyads level. Furthermore, gender differences were found between women's and men's attitudes,  $t(188) = -5.45$ ,  $P < .001$ , with men reporting more positive attitudes towards sex during pregnancy

**Table 2.** Sexual behavior frequencies for pregnant women and male partners ( $N = 378, 189$  women)

	Women		Men	
	<i>n</i>	%	<i>n</i>	%
<b>Vaginal penetration</b>				
Never	27	14.3	28	14.8
About once a month	20	10.6	16	8.5
2–3 times a month	39	20.6	41	21.7
1–2 times a week	83	43.9	75	39.7
3–6 times a week	17	9.0	26	13.8
Once a day or more	3	1.6	3	1.6
<b>Solo masturbation</b>				
Never	117	61.9	59	31.2
About once a month	21	11.1	22	11.6
2–3 times a month	19	10.1	25	13.2
1–2 times a week	28	14.8	52	27.5
3–6 times a week	3	1.6	28	14.8
Once a day or more	1	0.5	3	1.6
<b>Manual stimulation by partner</b>				
Never	69	36.5	79	41.8
About once a month	20	10.6	40	21.2
2–3 times a month	30	15.9	22	11.6
1–2 times a week	58	30.7	36	19.0
3–6 times a week	9	4.8	11	5.8
Once a day or more	3	1.6	1	.5
<b>Mutual masturbation</b>				
Never	87	46.0	95	50.3
About once a month	14	7.4	22	11.6
2–3 times a month	37	19.6	25	13.2
1–2 times a week	39	20.6	34	18.0
3–6 times a week	11	5.8	12	6.3
Once a day or more	1	0.5	1	0.5
<b>Oral sex</b>				
Never	71	37.6	67	35.4
About once a month	37	19.6	36	19.0
2–3 times a month	31	16.4	33	17.5
1–2 times a week	41	21.7	38	20.1
3–6 times a week	8	4.2	13	6.9
Once a day or more	1	0.5	2	1.1
<b>Kissing</b>				
Never	2	1.1	1	0.5
About once a month	0	0	0	0
2–3 times a month	4	2.1	3	1.6
1–2 times a week	6	3.2	5	2.6
3–6 times a week	14	7.4	20	10.6
Once a day or more	163	86.2	160	84.7
<b>Caressing</b>				
Never	2	1.1	2	1.1
About once a month	2	1.1	3	1.6
2–3 times a month	6	3.2	6	3.2
1–2 times a week	7	3.7	9	4.8
3–6 times a week	25	13.2	29	15.3
Once a day or more	147	77.8	140	74.1
<b>Anal penetration</b>				

(continued)

**Table 2.** Continued

	Women		Men	
	<i>n</i>	%	<i>n</i>	%
Never	171	90.5	171	90.5
About once a month	15	7.9	14	7.4
2–3 times a month	2	1.1	1	0.5
1–2 times a week	0	0	1	0.5
3–6 times a week	1	0.5	1	0.5
Once a day or more	0	0	1	0.5
<b>Use of sex toys</b>				
Never	166	87.8	169	89.4
About once a month	14	7.4	17	9.0
2–3 times a month	6	3.2	2	1.1
1–2 times a week	1	0.5	0	0
3–6 times a week	2	1.1	1	0.5
Once a day or more	0	0	0	0

( $M = 4.70$ ,  $SD = 0.78$ ) than pregnant women ( $M = 4.37$ ,  $SD = 0.87$ ).

Only actor effects were found for the examined APIM models for mixed-outcomes. Both partners' more positive attitudes towards sex during pregnancy were associated with higher frequency of vaginal penetration [ $B_{MSP} = 0.26$ ,  $P < .001$ ;  $B_{PSP} = 0.40$ ,  $P < .001$ ], manual stimulation by partner [ $B_{MSP} = 0.46$ ,  $P < .001$ ;  $B_{PSP} = 0.40$ ,  $P < .01$ ], mutual masturbation [ $B_{MSP} = 0.20$ ,  $P < .05$ ;  $B_{PSP} = 0.28$ ,  $P < .01$ ], and oral sex [ $B_{MSP} = 0.18$ ,  $P < .05$ ;  $B_{PSP} = 0.30$ ,  $P < .01$ ], but were not associated with frequencies of solo masturbation ( $p_{MSP} = 0.49$ ,  $p_{PSP} = 0.31$ ), kissing ( $P = .49$ ), caressing ( $P = .07$ ), anal penetration ( $P = .77$ ), or use of sex toys ( $P = .13$ ).

## DISCUSSION

The MSP and PSP<sup>7</sup> are short unidimensional scales that allow the assessment of pregnant individuals' and their partners' attitudes toward sex during pregnancy based on the premise of interdependence between partners' scores. This study aimed to examine dyadic non-independence of MSP/PSP scores in a sample of expectant couples, while providing an evaluation of factor structure, validity, and reliability of the Portuguese versions of the MSP/PSP.

The present study suggested the Portuguese versions of the MSP and the PSP are reliable unidimensional self-report measures of maternal and paternal attitudes towards sex during pregnancy. Confirmatory factor analyses corroborated the unidimensional structure of both scales, resembling their original factor structure<sup>7</sup>. Both scales demonstrated good indices of internal consistency and good to excellent indices of validity (convergent, discriminant, and concurrent). Compared to the original validation study, in which ratings across items were fairly homogenous, pregnant women in the current sample demonstrated greater variability in the degree to which they endorsed the items

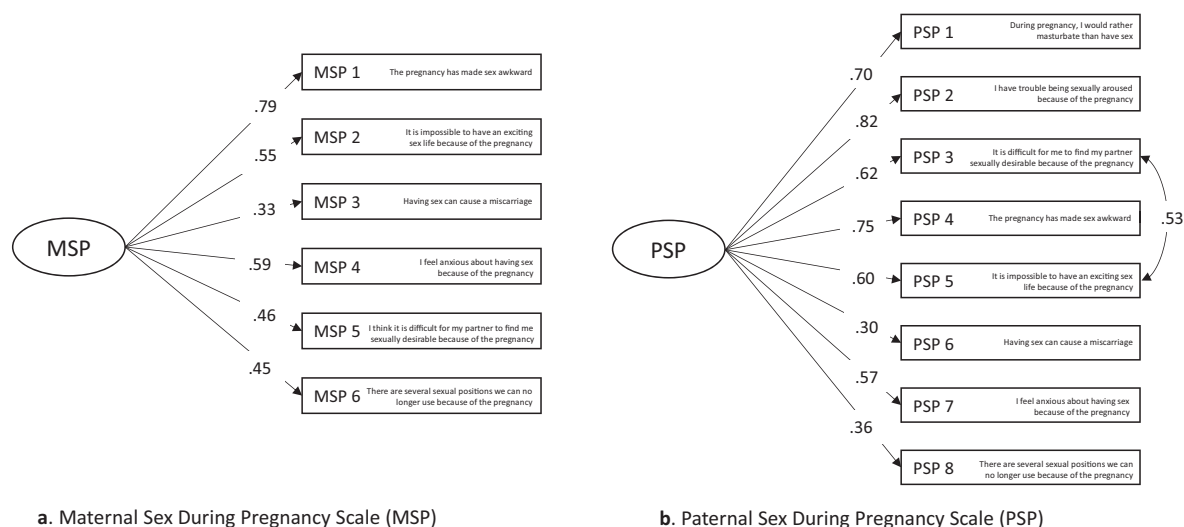


Figure 1. Path diagram of the 1-factor structure of the MSP (a) and the PSP (b)

comprised in the MSP, which might be related to the slightly lower Cronbach's alpha observed in the present study for the MSP. Both the MSP and the PSP presented good convergent validity, showing positive associations with the MAMA/PAPA Sexual Attitudes subscale scores. This was expected since both scales include items that have been used to measure partners' attitudes towards sex during the transition to parenthood.<sup>7,16</sup> The MSP and PSP were not correlated, for the most part, to distal constructs such as depression and perceived social support, indicating good discriminant validity. Taken together, these results support the construct validity of the scales. Results from this study also establish concurrent validity given that more positive attitudes towards sex during pregnancy were linked to higher sexual satisfaction and better sexual function (for most subscales as well as total score) for both pregnant women and their male partners, consistently with prior evidence.<sup>1</sup> These results demonstrate that the Portuguese versions of the scales can be used to assess couple members' levels of attitudes towards sex during pregnancy with adequate psychometric properties.

As predicted, partners scores on the MSP and the PSP were interdependent, giving emphasis to the assessment of both couple members' attitudes, a central aspect allowed by the use of MSP/PSP scales. This result supports the hypothesis of these constructs being non-independent within dyads or, in other words, that one partner's attitudes towards sex during pregnancy likely inform the other's,<sup>2,11,12</sup> which is relevant for future clinical as well as research advancements.

Still, current results also indicated that, overall, partners in mixed-gender/sex (male/female) couples were likely to present different attitudes towards sex during pregnancy according to their gender. In line with what is known regarding general attitudes toward sex,<sup>39,40</sup> male partners presented significantly more positive attitudes towards sex during pregnancy than pregnant women. Particularly in the context of pregnancy, women are

more likely to be directly affected by the emerging physical changes (eg, discomfort, perception of fetal movements) which can further influence their sexual experiences<sup>41</sup> and shape their attitudes towards sex while pregnant. This gender difference in attitudes between male and female partners may partially explain the fact that variability in attitude scores was slightly higher within-dyads (ie, between the individuals in the couple) than between-dyads (ie, between the various dyads) and suggests that specific factors may be contributing to differences between women's and men's attitudes towards sex during pregnancy, an aspect which future studies may consider examining. Another remaining question from this study concerns the degree to which expectant partners' (ie, the pregnant individual and their partner) congruence or agreement in their attitude toward sex during pregnancy poses specific benefits for their sexual well-being across the transition. Since couples' decision to engage or avoid sex during pregnancy is prominently interpersonal, couples' sexual well-being across pregnancy might be better accounted by the combination of *both* partners' attitudes, above and beyond the contribution of each partner's attitudes.

Attitudes comprise both cognitive and affective dimensions but are also assumed to influence one's behavior.<sup>11,17,18</sup> To further establish attitude's influence on partners' sexual experiences during pregnancy, we sought to test the associations between attitudes towards sex during pregnancy and the frequency with which couple members engaged in a variety of sexual activities. Results of the current study showed only intraindividual effects whereby women and men with a more positive attitude towards sex during pregnancy reported engaging more frequently in sexual behaviors involving women's genital area (ie, vaginal penetration, manual stimulation by partner, mutual masturbation, and oral sex), whether these included vaginal penetrations or not. No partner effects were found, suggesting that, although expectant individuals' attitudes are related to their own sexual behavior,

**Table 3.** MSP/PSP: Item analysis and internal consistency ( $N = 189$  women and 189 men)

Item	M	SD	MIC	ITC	$\alpha$ IID
MSP ( $\alpha = .71$ )			.295		
1. The pregnancy has made sex awkward	4.05	1.46		0.609	0.616
2. It is impossible to have an exciting sex life because of the pregnancy	4.43	1.46		0.459	0.668
3. Having sex can cause a miscarriage	5.14	.90		0.363	0.699
4. I feel anxious about having sex because of the pregnancy	4.70	1.35		0.536	0.644
5. I think it is difficult for my partner to find me sexually desirable because of the pregnancy	4.57	1.35		0.377	0.693
6. There are several sexual positions we can no longer use because of the pregnancy	3.31	1.57		0.357	0.706
Total MSP	4.37	.87			
PSP ( $\alpha = .81$ )			.349		
1. During pregnancy, I would rather masturbate than have sex	4.62	1.31		0.592	0.775
2. I have trouble being sexually aroused because of the pregnancy	4.92	1.16		0.698	0.760
3. It is difficult for me to find my partner sexually desirable because of the pregnancy	5.28	.93		0.549	0.785
4. The pregnancy has made sex awkward	4.74	1.27		0.694	0.758
5. It is impossible to have an exciting sex life because of the pregnancy	4.83	1.31		0.566	0.779
6. Having sex can cause a miscarriage	5.35	.85		0.301	0.814
7. I feel anxious about having sex because of the pregnancy	4.98	1.07		0.501	0.789
8. There are several sexual positions we can no longer use because of the pregnancy	2.90	1.51		0.355	0.810
Total PSP	4.70	.78			

$\alpha$  = Cronbach's alpha; IID = if item deleted; ITC = item–total correlation; M = mean; MIC = mean–item correlation; SD = standard deviation.

they do not influence their partner's frequency of sexual behaviors above and beyond their partners' own attitudes. Indeed, as proposed by Ajzen and Fishbein,<sup>17</sup> the most proximal predictor of a behavior is our intention to perform it, which, in turn, depends on our own attitude toward that behavior. As such, individual attitudes toward sex during pregnancy may represent a more immediate focus for clinicians who wish to target expectant partners' sexual behavior avoidance/approach during pregnancy.

Current results also support that expectant individuals who refrain from sexual activity during pregnancy might do so because they fear that sexual activity might induce complications to the pregnancy.<sup>3,4,7,14</sup> Interestingly, the type of sexual activities linked to couple members' attitudes not only comprised vaginal penetration but also included other sexual activities involving the vulvar region (ie, manual stimulation by the partner, oral sex). This finding is novel and suggests that concerns about sex are likely to be of a wide range and can span from fear of negative

obstetric events due to vaginal penetration (eg, pregnancy loss or harm to the fetus) to concerns caused by other sexual activities that involve stimulation of the vulva (eg, an infection). On the other hand, and consistent with our predictions, one's own or one's partner attitudes towards sex during pregnancy were not related to the frequency of engaging in other types of sexual behaviors such as caressing, kissing, solo masturbation, anal penetration, nor the use of sex toys, partially replicating previous findings.<sup>11</sup> Still, we note that couples in this study reported

**Table 5.** MSP/PSP: Correlations between the MSP/PSP and sexual satisfaction and sexual functioning

	MSP	PSP
Sexual satisfaction (GMSEX; $n = 189$ women and men)	0.28**	0.35**
Sexual functioning ( $n = 167$ women and 163 men)		
Total (FSFI)	0.39**	—
Desire	0.31**	—
Arousal	0.43**	—
Lubrication	0.12	—
Orgasm	0.22**	—
Satisfaction	0.26**	—
Pain	0.30**	—
Total (IIEF)	—	0.35**
Sexual desire	—	0.17*
Erectile function	—	0.19*
Orgasmic function	—	0.09
Intercourse satisfaction	—	0.30**
Overall satisfaction	—	0.31**

**Table 4.** MSP/PSP: Correlations between the MSP/PSP and attitudes to sex, depressive symptoms, and perceived social support ( $N = 189$  women and men)

	MSP	PSP
Attitudes to sex (MAMA-AS/PAPA-AS)	0.58 <sup>†</sup>	0.61 <sup>†</sup>
Depressive symptoms (EPDS)	−0.19*	−0.12
Perceived social support (MSPSS)	0.10	0.15*
Family	−0.02	0.09
Friends	0.10	0.14
Significant other	0.18*	0.14

\* $P < .05$ .

<sup>†</sup> $P < .01$ .

\* $P < .05$ .

\*\* $P < .01$ .



engaging infrequently in some of these sexual behaviors (eg, anal penetration, use of sexual toys), which is also consistent with previous findings with samples of expectant couples.<sup>11</sup>

Although the present study provides the first validation of the MSP/PSP to the Portuguese context and offers noteworthy results on how attitudes towards sex relate to couples' sexual experiences during pregnancy, these results need to be interpreted considering a few limitations. The voluntary nature of the participation on a study about sexuality may have led to a selection bias, given that those who agreed to participate may, in fact, be those who feel more involved and satisfied with the pregnancy and with their sexual experiences.<sup>42</sup> Some characteristics of our sample are not representative of all newly expectant couples in Portugal. Although participants' marital status and age for having a first child are in line with the national data, most participants were highly educated. It is possible that higher levels of education might influence the attitudes that individuals present. Also, although this was not defined as an inclusion criterion, all couples who participated in the study were in mixed-gender/sex relationships and predominantly white/caucasian. Thus, future studies should use the MSP and PSP in more diverse samples in order to further determine how the scale performs for couples with different characteristics, including same-gender/sex couples and couples with more diverse socioeconomic (eg, lower education levels, racial and ethnic minorities) characteristics.

### Implications for Practice and Research

The scale MSP/PSP measures attitudes using statements phrased in a negative manner to which individuals are given the opportunity to agree or disagree with, but future studies might want to assess whether using statements phrased in a positive manner might influence the way in which individuals respond. Considering current and prior evidence of validity and reliability of the MSP/PSP, these instruments are valuable resources for researchers and clinical practitioners to assess both couple member's sexual attitudes during the transition to parenthood. The identification of misconceptions and negative attitudes towards sex during pregnancy may be fundamental to better understand the processes involved in both member's adjustment during this period. These attitudes may interact with other relevant factors during pregnancy – such as anxiety, the existence of previous miscarriage(s), or whether one's has experienced complications with the current pregnancy<sup>7</sup> – and act as possible mediators and moderators of couple's well-being. Thus, the early assessment of these dimensions may prove helpful to clarify existing worries and concerns and anticipate preventable changes in couples' sexuality while transitioning to parenthood.

Altogether, the present study's results highlight the importance of prenatal care providers to advise expectant couples that sexual activities present no significant risk to their pregnancy, including those that involve penetration. Sexual activity may, in fact, assist couples in maintaining intimacy and relationship quality<sup>43,44</sup> throughout pregnancy, aspects which have been found to

predict couples' positive adjustment postpartum.<sup>45</sup> Researchers and clinicians are presented with a timely opportunity to assess sexual concerns with both members of expectant couples. The use of the MSP/PSP is one way of detecting and targeting such concerns.

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### STATEMENT OF AUTHORSHIP

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