

# European Journal of Ageing

## Emotional Intimacy and Sexual Well-Being in Aging European Couples: A Cross-Cultural Mediation Analysis

--Manuscript Draft--

<b>Manuscript Number:</b>	EJOA-D-18-00178R2	
<b>Full Title:</b>	Emotional Intimacy and Sexual Well-Being in Aging European Couples: A Cross-Cultural Mediation Analysis	
<b>Article Type:</b>	Original Investigation	
<b>Corresponding Author:</b>	Aleksandar Štulhofer, Ph.D. Sveuciliste u Zagrebu Filozofski fakultet CROATIA	
<b>Corresponding Author Secondary Information:</b>		
<b>Corresponding Author's Institution:</b>	Sveuciliste u Zagrebu Filozofski fakultet	
<b>Corresponding Author's Secondary Institution:</b>	Faculty of Humanities and Social Sciences, University of Zagreb	
<b>First Author:</b>	Aleksandar Štulhofer, Ph.D.	
<b>First Author Secondary Information:</b>		
<b>Order of Authors:</b>	Aleksandar Štulhofer, Ph.D. Tanja Jurin Cynthia Graham, Ph.D. Erick Janssen Bente Træen, Ph.D.	
<b>Order of Authors Secondary Information:</b>		
<b>Funding Information:</b>	Norwegian Research Council (250637)	Prof. Bente Træen
<b>Abstract:</b>	<p>Sexual health research tends to focus on problematic aspects of sexuality. This also applies to research on sexuality in older men and women, where attention has been primarily on the negative impact of aging. To contribute to the emerging interest in positive (successful) sexual aging, we aimed to: (1) further validate a recently developed 5-dimensional measure of sexual well-being (Štulhofer et al., 2018) and (2) explore the structure of associations among emotional intimacy, frequency of sexual intercourse, and sexual well-being in older European couples. Using data from a 2016 community-based survey of 218 Norwegian, 207 Danish, 135 Belgian, and 117 Portuguese couples aged 60-75 years, we applied actor-partner interdependence structural modeling approach to confirm the validity of the sexual well-being measure in couples and explore a path analytic model in which the frequency of sexual intercourse was hypothesized to mediate the association between emotional intimacy and sexual well-being. Although we observed consistent and significant actor effects, with emotional intimacy and frequency of sexual intercourse predicting both male and female partners' sexual well-being across countries, the proposed mediation was observed only in Norwegian and Portuguese men, and Norwegian and Belgian women. Partner effects were gender-specific; male partner's emotional intimacy was related to his female partner's reported frequency of sex and sexual well-being but not the other way around. Apart from being one of the few cross-cultural assessments of successful sexual aging, this study's findings support the use of a new sexual well-being measure in research on older adults' sexuality.</p>	
<b>Response to Reviewers:</b>	Editor: How was the sub-sample of couples recruited? Indeed, as it is formulated, it could mean that a selection of the couples was used which would need a clarification about how the selection was done. It may also be that the authors mean to say that for the study sample only the data of couples are used. Please, clarify.	

Reviewer: I may have missed it but it is still vague in the Method section how the sub-sample was recruited from the larger study, including the inclusion and exclusion criteria used to recruit the sub-sample.

Our Response: The dyadic recruitment is now explained in more detail at the beginning of page 8. The relevant portion of the text reads: „In this study, we only used the data from a subsample of couples, who were recruited in parallel with individual participants. All coupled participants in the targeted age range (60-75 years) who agreed to participate in the study were asked if their partner would also like to take part. If the partner provided her/his consent, both members of the couple were mailed a questionnaire. This dyadic subsample included 218 couples in Norway, 207 in Denmark, 135 in Belgium, and in 117 Portugal.”

**Abstract:**

Sexual health research tends to focus on problematic aspects of sexuality. This also applies to research on sexuality in older men and women, where attention has been primarily on the negative impact of aging. To contribute to the emerging interest in positive (successful) sexual aging, we aimed to: (1) further validate a recently developed 5-dimensional measure of sexual well-being (Štulhofer et al., 2018) and (2) explore the structure of associations among emotional intimacy, frequency of sexual intercourse, and sexual well-being in older European couples. Using data from a 2016 community-based survey of 218 Norwegian, 207 Danish, 135 Belgian, and 117 Portuguese couples aged 60-75 years, we applied actor-partner interdependence structural modeling approach to confirm the validity of the sexual well-being measure in couples and explore a path analytic model in which the frequency of sexual intercourse was hypothesized to mediate the association between emotional intimacy and sexual well-being. Although we observed consistent and significant actor effects, with emotional intimacy and frequency of sexual intercourse predicting both male and female partners' sexual well-being across countries, the proposed mediation was observed only in Norwegian and Portuguese men, and Norwegian and Belgian women. Partner effects were gender-specific; male partner's emotional intimacy was related to his female partner's reported frequency of sex and sexual well-being but not the other way around. Apart from being one of the few cross-cultural assessments of successful sexual aging, this study's findings support the use of a new sexual well-being measure in research on older adults' sexuality.

**Key Words:** Aging, sexual well-being, intimacy, sexual activity, couples, APIM

# Emotional Intimacy and Sexual Well-Being in Aging European Couples: A Cross-Cultural Mediation Analysis

## INTRODUCTION

Traditionally, sexual health research tends to focus on problematic aspects of sexuality and sexual behavior, including sexual risk-taking and sexual problems and their treatment. This seems to apply in spades to research on sexuality in older men and women, where attention has primarily been on the negative impact of aging on sexual function (Syme et al. 2018). More recently, however, there has been increased interest in positive aspects of sexuality, such as sexual well-being (Graf and Patrick 2014), sexual wellness (Syme et al. 2018), and sexual satisfaction (Neto 2012; Pascoal et al. 2014). Several definitions of sexual well-being have been put forward, but most include both affective and cognitive dimensions related to the perceived quality of an individual's sexuality, sexual life, and relationships (Rosen and Bachmann 2008; Neto 2012; Graf and Patrick 2014).

While the increased attention to positive aspects of sexuality is a welcome development, the focus on sexual function and sexual activity that characterizes research on sexual well-being may be problematic in the context of aging. For example, Rosen and Bachmann (2008) operationalized sexual well-being in terms of sexual function, interest, and satisfaction. This narrow focus on sexual function and activity is limiting for several reasons. First, while older men and women are more likely than younger individuals to report sexual function problems (Mitchell et al. 2013; Hendrickx et al. 2015; Peixoto and Nobre 2015), distress associated with such problems may be low (Bancroft et al. 2003; Lee et al. 2016; Santos-Iglesias et al. 2016). Secondly, studies have suggested that for many older adults, physical closeness and intimacy may be more important than sexual activity *per se* (Sandberg 2013; Müller et al. 2014; Lee et al.

1  
2  
3  
4 2016; Fileborn et al. 2017; Freak-Poli et al. 2017). Based on findings from a large study of  
5  
6 midlife and older adults' definitions of sexual wellness, Symes et al. (2018) concluded that  
7  
8 conceptualizing and measuring sexual wellness in this population requires a multidimensional  
9  
10 approach that includes psychological, social, and attitudinal aspects in addition to sexual function  
11  
12 and activity-related ones. Thus, the limited research that exists in this area highlights the  
13  
14 importance of conceptualizing sexual well-being differently for older adults.  
15  
16  
17

18  
19         It should be noted that most measures of sexual well-being have been validated in  
20  
21 individuals with sexual problems (e.g., Costa et al. 2003; Abraham et al. 2008; Rosen et al. 2009)  
22  
23 and many were developed using only samples of female participants, often premenopausal  
24  
25 women (Öberg et al. 2002; De Visser et al. 2007; Rosen et al. 2009; Stephenson et al. 2010;  
26  
27 Muise et al. 2010; Bancroft et al. 2011; Anderson et al. 2016). As yet, no existing measure of  
28  
29 sexual well-being has been validated in older adults.  
30  
31  
32

33  
34         Using a population-based sample of older individuals (60+) from four European countries  
35  
36 (Štulhofer, Jurin, Graham, Enzlin, & Træen, 2018), we have developed and validated a  
37  
38 multidimensional measure of sexual well-being in older adults. The measure includes five  
39  
40 dimensions: physical intimacy, emotional closeness during sex, sexual compatibility, sexual  
41  
42 satisfaction, and distress related to sexual function problems. In support of its convergent  
43  
44 validity, we found that the well-being measure was significantly and positively associated with  
45  
46 emotional intimacy and frequency of sexual intercourse, and negatively with masturbation  
47  
48 (Štulhofer et al., 2018).  
49  
50  
51

52  
53         In the current study, we attempted to validate the new measure in a cross-cultural dyadic  
54  
55 sample and explore structural associations among emotional intimacy, the frequency of sexual  
56  
57 activity, and sexual well-being in a multi-country sample of older couples. The study has a  
58  
59 potential to inform health professionals working with older population about the structure of  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 sexual well-being, as well as the roles of emotional intimacy and sexual intercourse in aging  
5  
6 European couples' sexual well-being.  
7  
8

### 9 **Emotional Intimacy and Sexuality in Aging Men and Women**

10  
11 A number of studies have highlighted the importance of emotional intimacy for aging  
12  
13 individuals' sexuality (Laumann et al. 2006; Sandberg 2013; Müller et al. 2014; Fileborn et al.  
14  
15 2017). In a longitudinal population-based study of aging German men and women, participants in  
16  
17 the highest age group (74 years), prioritized "affection" over sexual activity. In the Australian  
18  
19 Sex, Age, and Me study (Fileborn et al. 2017), qualitative interviews with individuals aged 60  
20  
21 and older revealed that both men and women considered intimacy and bonding a central  
22  
23 component of their sexual lives.  
24  
25  
26  
27

### 28 **Aging and the Frequency of Sexual Activity**

29  
30  
31 While not all older adults are engaging in partnered sexual activity (in many cases  
32  
33 because they do not have a partner; (Træen et al. 2017), many mid- and later life adults do remain  
34  
35 sexually active (Lindau et al. 2007; Waite et al. 2009; DeLamater 2012; Wang et al. 2015).  
36  
37 Research indicates that for the majority of older adults, sex remains important to their quality of  
38  
39 life and is considered a central element of a satisfying relationship (Fisher et al. 2010).  
40  
41  
42

43  
44 In a review of the literature on factors associated with sexual well-being in older adults,  
45  
46 Kleinstäuber (2017) noted that the links between sexual activity and sexual wellbeing are variable  
47  
48 and complex. Different operationalizations of sexual activity likely contribute to this situation. In  
49  
50 another review, involving 57 studies on sexual activity in adults at least 60 years old, Bell et al.  
51  
52 (2017) noted an "overwhelming focus on intercourse" (p. 21). However, older adults may focus  
53  
54 more on other types of sexual behavior (Lindau et al. 2007; Fisher et al. 2010; Trudel et al. 2014)  
55  
56 which suggests that older couples' sexual activity is underestimated when it is evaluated solely  
57  
58 by measuring the frequency of sexual intercourse.  
59  
60  
61  
62  
63  
64  
65

## Emotional Intimacy and Sexual Activity

Evidence supporting the importance of closeness, affection, and emotional intimacy during sexual activity in older adults mainly—although not exclusively (see Heiman et al. 2011)—comes from qualitative studies. In a qualitative study with 30 men and women aged 60-82 years, a factor labelled “depth” contributed to “optimal” sexual experiences (Ménard et al. 2015). Depth referred to “the connection, the intimacy, the love, the caring and the levels of trust, safety and communication that they felt with their partners” (Ménard et al. 2015 p. 87). While the importance of emotional intimacy during sex has been most often studied in women, several recent studies also highlight the importance of emotional intimacy for older men’s sexuality. These studies challenge the idea that intimacy for men is either arduous or unimportant and that male sexuality is firmly tied to the ability to perform during intercourse and to reach orgasm (Sandberg 2013). For example, Fileborn et al. (2017) found that Australian men aged 60+, when asked about the importance of sex, frequently indicated that sexual activity plays a vital role in emotional bonding and maintaining intimacy with a partner. Partnered sexual activity was described as offering higher levels of intimacy and closeness than platonic relationships could provide. In interviews, Swedish heterosexual men aged 67–87 years described intimacy as something “more or other than sexual intercourse,” including touching, feelings of love and emotional closeness in a committed relationship (Sandberg 2013). Older men also recounted how the importance of intimacy had increased with age. While their sexual activity at younger ages used to be much more focused on penetrative sex, at the time of the interview it was primarily experienced through sensual touch and intimacy (Sandberg 2013).

Studies involving mixed-age samples also demonstrated the importance of emotional intimacy and closeness during sex. In a U.S. study of women aged 20-65 years, one of the strongest (negative) predictors of distress about their sexual relationship was how emotionally

1  
2  
3  
4 close women felt to their partner during sexual activity (Bancroft et al. 2003). Murray et al.  
5  
6 (2017) interviewed men aged 30-65 years in long-term relationships, who discussed how intimate  
7  
8 communication with their partner sometimes “sparked” closeness and could lead to sexual  
9  
10 activity. In a focus group study of men aged 18-70 years, some participants described how an  
11  
12 emotional connection with their partner could positively impact, and sometimes be key to, the  
13  
14 experience of sexual arousal during partnered sex (Janssen et al. 2008).  
15  
16  
17

### 18 **Dyadic Approach**

19  
20  
21 In recent years, researchers in the area of romantic relationships have started to apply  
22  
23 dyadic approaches (e.g., Muise et al. 2018). In contrast to traditional individual-based  
24  
25 approaches, dyadic approaches use the couple as the unit of analysis and allow for a more  
26  
27 realistic assessment of (interdependent) perceptions, beliefs and behaviors, including those  
28  
29 relevant to aging men’s and women’s sexual well-being. For example, Bell et al. (2017) found  
30  
31 decreased sexual activity in individuals over 60 years of age to be strongly associated with the  
32  
33 partner’s sexual and other physical health problems. These findings underscore the importance of  
34  
35 looking beyond individual-level analyses when trying to improve our understanding of sexual  
36  
37 well-being in older adults. While the use of dyadic analytic approaches is now common in  
38  
39 relationship research, it is largely absent from the assessment of sexuality and sexual well-being  
40  
41 among older men and women.  
42  
43  
44  
45  
46  
47

### 48 **Current Study**

49  
50 To the best of our knowledge this is the first cross-cultural study of aging couples’  
51  
52 sexuality that uses a dyadic approach. The study had two aims: (1) to further validate a 5-  
53  
54 dimensional measure of sexual well-being that was recently developed in a large-scale non-  
55  
56 dyadic sample from four European countries (Træen, Štulhofer, Janssen, Carvalheira, Hald,  
57  
58 Lange, & Graham, 2018) and (2) to explore the structure of associations among older couples’  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 emotional intimacy, frequency of sexual intercourse, and sexual well-being. Due to exploratory  
5  
6 character of our study, no specific hypotheses were proposed.  
7  
8

9         Based on the literature on the associations between emotional closeness and sexual  
10 activity and on the advantages of using a dyadic approach (Muise et al. 2018), we tested a model  
11 in which the frequency of sexual intercourse was hypothesized to mediate the association  
12 between the couple's emotional intimacy and sexual well-being. Several points of interest were  
13 explored in the model. First, we were interested in comparing male and female partner effects.  
14 Taking into account traditional and gender-specific sexual socialization, we expected to find male  
15 partner effects more pronounced than female partner effects. Secondly, we analyzed the  
16 association between emotional intimacy and sexual well-being to add to insights about a robust  
17 link between intimacy and sexual satisfaction, particularly among aging individuals. Finally,  
18 taking into account that the central role of sexual intercourse in heterosexual relationships has  
19 been shown to wane with aging, we wanted to explore whether sexual activity remains a  
20 psychosocial behavioral factor underlying the relationship between emotional intimacy and  
21 sexual well-being in older couples.  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39

## 40         METHOD

### 41         **Participants and Procedures**

42  
43         Data for this study was collected as part of a postal survey on sexuality among aging men  
44 and women that was carried out in four European countries (Norway, Denmark, Belgium and  
45 Portugal) in 2016. The survey used national probability-based samples of men and women aged  
46 60-75 years (Træen, Štulhofer, Janssen, Carvalheira, Hald, Lange, & Graham, 2018). The sample  
47 size was 1,270 in Norway, 1,045 in Denmark, 990 in Belgium, and 509 in Portugal, with  
48 participation rates ranging from 68.2% in Norway to 25.5% in Portugal. The notably higher non-  
49 participation rate in Portugal likely reflected lower education levels and higher traditionalism  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

(suggested by higher religiosity observed among Portuguese participants. In this study, we only used the data from a subsample of couples, who were recruited in parallel with individual participants. All coupled participants in the targeted age range (60-75 years) who agreed to participate in the study were asked if their partner would also like to take part. If the partner provided her/his consent, both members of the couple were mailed a questionnaire. This dyadic subsample included 218 couples in Norway, 207 in Denmark, 135 in Belgium, and in 117 Portugal.

The average age of the participants ranged from 67.7 years (SD = 3.87) in Denmark to 65.6 (SD = 4.18) in Portugal. Duration of the relationship/marriage was, similarly, the longest among Danish (M = 40.58, SD = 12.77) and the shortest among Portuguese partners (M = 30.30, SD = 17.42). We observed substantial educational differences between countries (see Table 1). Couples in Norway had the highest proportion of college educated (55.1%) and the lowest proportion of only primary-school educated partners (9.9%). In contrast, among Portuguese couples, only 15.8% of partners reported tertiary education and 37.6% primary education.

### **Questionnaire and Measures**

After they were contacted by phone, prospective participants were sent a questionnaire through the mail (developed in English and translated into local languages by members of an international research team). Couples were asked to complete the questionnaire separately.

Following our earlier paper (Štulhofer et al., 2018), *sexual well-being* was operationalized as a latent construct consisting of the following five dimensions. (1) Sexual satisfaction was assessed with two related items (zero-order correlation coefficients ranged from .68 to .80 across countries): *Thinking about your sex life in the last year, how satisfied are you with your sexual life?* and *How satisfied are you with the current level of sexual activity in your life, in a general way?* Answers were recorded using a 5-point Likert-like scale. The composite variable had

1  
2  
3  
4 satisfactory reliability (Cronbach's  $\alpha$  ranged from .77 to .81). (2) The frequency of cuddling and  
5  
6 caressing was assessed by two items ( $r = .46-.56$ ): *Over the past 4 weeks, how often have you*  
7  
8 *been sexually touched and caressed by your partner?* (1 = not at all to 5 = almost daily) and *My*  
9  
10 *partner and I kiss and cuddle each other...* (1 = seldom, 2 = often) developed by Heiman et al.  
11  
12 2011. The two items were multiplied, with higher scores pointing to more frequent cuddling and  
13  
14 caressing. (3) Sexual intimacy was measured by the following one-item indicator: *I feel*  
15  
16 *emotionally close to my partner when we have sex together*. Responses (1 = always to 5 = hardly  
17  
18 ever) were reverse-coded so that higher scores denote higher sexual intimacy. (4) Perceived  
19  
20 sexual compatibility was assessed using two items from the NATSAL-SF tool (Jones et al. 2015):  
21  
22 *My partner and I share the same level of interest in having sex* and *My partner and I share the*  
23  
24 *same sexual likes and dislikes*. Responses were anchored using a Likert-type scale. The two  
25  
26 items, which were strongly correlated across the four countries ( $r = .62-.81$ ), were summed, with  
27  
28 higher scores indicating higher sexual compatibility. Finally, (5) distress over sexual function  
29  
30 was measured by a modified version of the NATSAL-SF (Jones et al. 2015). Participants who  
31  
32 experienced one of more sexual difficulties in the past 12 months were asked to indicate the level  
33  
34 of distress (ranging from 1 = no distress to 4 = severe distress) associated with each of eight  
35  
36 common sexual difficulties. Distress scores were reverse-coded (higher scores point to lower  
37  
38 levels of stress over one's sexual function) and summed into a composite indicator.

39  
40  
41  
42  
43  
44  
45  
46  
47  
48 *Emotional intimacy* was assessed using the 5-item (e.g., *I can share my deepest thoughts*  
49  
50 *and feelings with this person* and *This person cares deeply for me*) Emotional Intimacy Scale  
51  
52 (Sinclair and Dowdy 2005), which had a high reliability in all four countries (Cronbach's  $\alpha = .90-$   
53  
54  $.91$ ). Scale scores were reverse-coded, so that higher scores indicate higher intimacy.  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 *Sexual intercourse frequency (How many times have you had or attempted sexual*  
5 *intercourse...)* in the past month was assessed by a single-item indicator measured on a 7-point  
6  
7  
8  
9 scale ranging from 1 = none to 7 = more than once a day.

## 10 11 **Statistical Analysis**

12  
13  
14 Dyadic data are characterized by non-independence of partners' responses (partners are  
15  
16 nested within couples)—reflecting the shared reality of living together—which, if not taken into  
17  
18 account, results in biased estimates due to underestimated standard errors. The most common  
19  
20 approach to dyadic analysis, the Actor-Partner Independence Model (APIM; Kenny et al. 2006;  
21  
22 Muise et al. 2018), enables the distinction between *actor effects*, or associations between actor's  
23  
24 characteristics (e.g., the relationship between a person's beliefs about his/her aging body and  
25  
26 sexual satisfaction), and *partner effects*, or associations between actor's and his/her partner's  
27  
28 characteristics (e.g., the relationship between the person's beliefs about his/her aging body and  
29  
30 his/her partner's sexual satisfaction). Although APIM can be implemented using various  
31  
32 statistical techniques, the current study employed structural equation modeling approach to  
33  
34 estimate direct and indirect actor- and partner-specific effects of emotional intimacy on sexual  
35  
36 well-being.  
37  
38  
39  
40  
41  
42

43 Using confirmatory factor analysis (CFA), we first re-assessed the 5-dimensional model  
44  
45 of sexual well-being developed in the non-dyadic sample (Štulhofer et al., 2018). Model fit was  
46  
47 evaluated by the comparative fit index (CFI) values  $\geq .90$  (acceptable fit) or  $\geq .95$  (excellent fit)  
48  
49 and the RMSEA index of parsimony values  $\leq .05$  (excellent fit) or  $\leq .08$  (acceptable fit) (Byrne  
50  
51 2010). Next, we tested the model's measurement invariance across countries. Fit of the multi-  
52  
53 group baseline or unconstrained model was compared to progressively more constrained models  
54  
55 representing metric and scalar invariance (van de Schoot et al. 2012). Standard chi-square  
56  
57 difference test and CFI difference test ( $\Delta$ CFI), which is insensitive to sample size, were used for  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 model comparisons; values  $\leq .002$  indicated indistinguishable fit. At least partial scalar  
5  
6 invariance was required to justify between-countries comparisons (Bryne et al. 1998). In the final  
7  
8 step, the full APIM mediation model was explored separately for each country. Following Shrout  
9  
10 and Bolger (2002), mediation was assessed by inspecting bootstrapped 95% confidence intervals  
11  
12 around total and specific indirect effects (in the case when both actor- and partner-specific  
13  
14 mediation is present). Mediation is significant if lower and upper bounds are either below or  
15  
16 above zero.  
17  
18  
19

20  
21 All analyses were carried out using the IBM AMOS 22 statistical software package.  
22  
23 Except for mediation testing (cases with missing values were omitted to enable bootstrapping  
24  
25 with 1000 re-samples), missing information was estimated using the model-based full  
26  
27 information maximum likelihood (FIML) approach (Graham 2012; Arbuckle 2013).  
28  
29

## 30 RESULTS

31  
32 Sociodemographic characteristics of the sample are presented in Table 1. Couples' age  
33  
34 and relationship duration were the highest in Denmark and the lowest in Portugal (Kruskal-  
35  
36 Wallis  $H = 26.54$ ,  $p < .001$  and  $H = 41.01$ ,  $p < .001$ , respectively). On average, Danish couples  
37  
38 reported being together for 40.6 years, while Portuguese couples reported mean relationship  
39  
40 duration of about 30 years. Education levels were the highest in the Norwegian sample and the  
41  
42 lowest in the Portuguese sample ( $H = 82.40$ ,  $p < .001$ ). The opposite ranking was found in the  
43  
44 case of religiosity, as Portuguese couples reported the highest and Norwegian couples the lowest  
45  
46 frequency of attending religious ceremonies ( $H = 14.40$ ,  $p < .01$ ). Finally, a large urban residence  
47  
48 was most frequent in the Portuguese sample and least frequent in the Danish samples ( $H = 68.51$ ,  
49  
50  $p < .001$ ).  
51  
52  
53  
54  
55

56  
57 Means and standard deviations of the key indicators by country and partner are shown in  
58  
59 Table 2. Dyadic associations in reported levels emotional intimacy, which ranged from .85 in the  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 Norwegian couples and .62 in the Belgian couples, were systematically stronger than associations  
5  
6 in reported frequency of sexual intercourse ( $r = .52-.34$ ). Latent means of sexual well-being were  
7  
8 consistently higher in male compared to female partners, but the difference reached statistical  
9  
10 significance only the largest, Norwegian sample ( $p < .05$ ).  
11  
12

13 -----  
14  
15 TABLES 1 AND 2 ABOUT HERE  
16  
17  
18 -----  
19  
20

### 21 **Successful Well-Being Model**

22  
23 Figure 1 shows the model of well-being, developed in our earlier paper (Štulhofer et al.,  
24 2018), that was explored here using dyadic data. The findings of APIM-based CFA suggested  
25  
26 that the model fitted the data well ( $\chi^2_{(29)} = 92.71$ , CFI = .959, RMSEA = .057). To test for  
27  
28 measurement invariance, the baseline (unconstrained) multi-group model ( $\chi^2_{(116)} = 195.53$ , CFI =  
29  
30 .951, RMSEA = .032), with countries as groups, was compared to progressively more constrained  
31  
32 models that reflected metric and scalar invariance. After factor loadings for distress about sexual  
33  
34 function were allowed to vary by country, partial metric invariance was attained ( $\chi^2_{(128)} = 207.39$ ,  
35  
36 CFI = .951, RMSEA = .030; cf. Table 3), which confirmed the model's conceptual validity for  
37  
38 dyads in all four countries. Given that the levels (i.e., intercepts) of underlying items were  
39  
40 country-specific, direct cross-cultural comparisons of the associations among key constructs were  
41  
42 not warranted.  
43  
44  
45  
46  
47  
48  
49

50 -----  
51  
52 FIGURE 1 AND TABLE 3 ABOUT HERE  
53  
54  
55 -----  
56  
57

### 58 **Emotional Intimacy, Frequency of Sexual Intercourse, and Sexual Well-Being**

59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 The structure of associations among the key constructs was explored using path analytic  
5  
6 APIM with two manifest variables (emotional intimacy and frequency of sexual intercourse) and  
7  
8 one latent variable (sexual well-being). Using this model, we tested whether the frequency of  
9  
10 sexual intercourse mediated the association between partners' emotional intimacy and their  
11  
12 sexual well-being. After the initial model failed to reach acceptable fit ( $\chi^2_{(65)} = 389.61$ , CFI =  
13  
14 .898, RMSEA = .086), modification indices were inspected for suggestions about improving fit.  
15  
16 Allowing errors of sexual satisfaction and distress over sexual function items to covary (it is  
17  
18 highly plausible that distress caused by a sexual problem would directly affect sexual  
19  
20 satisfaction) improved fit:  $\chi^2_{(63)} = 322.00$ , CFI = .919, RMSEA = .078. An additional model  
21  
22 respecification entailed trimming four non-significant paths: (1) female partner's emotional  
23  
24 intimacy to male partner sexual well-being, (2) female partner's frequency of sex to male  
25  
26 partner's well-being, (3) female partner's intimacy to male partner's frequency of sex, and (4)  
27  
28 male partner's frequency of sex to female partner's sexual well-being. Compared to the full  
29  
30 model, this more parsimonious model (see Figure 2) fitted the data equally well ( $\Delta\text{CFI} = .002$ ).  
31  
32 The trimmed model explained 72-74% of variance in Norwegian, 69-70% in Danish, 75-77% in  
33  
34 Belgian, and 58-63% in Portuguese couples' well-being.  
35  
36  
37  
38  
39  
40  
41  
42

43 -----  
44  
45 FIGURE 2 ABOUT HERE  
46  
47  
48 -----  
49

### 50 **Culture-Specific Associations and Indirect Effects**

51  
52 The final, trimmed model was estimated separately for each country to explore actor-  
53  
54 partner structural associations and the mediating role of the frequency of sexual intercourse.  
55  
56 Relevant actor and partner direct effects (female partner's effects on her male partner's frequency  
57  
58 of sexual intercourse and sexual well-being were insignificant and thus trimmed across  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 countries), as well as indirect effects (actor- and partner-specific mediation), are presented in  
5  
6 Table 4. In the Norwegian sample, all direct effects were significant, except for the association  
7  
8 between male partner's emotional intimacy and the frequency of sex reported by his female  
9  
10 partner. Among Norwegian men, coital frequency substantially mediated the association between  
11  
12 emotional intimacy and sexual well-being. In their female partners, we observed two specific  
13  
14 mediation pathways (actor- and male partner-specific indirect effects). Subsequent testing  
15  
16 indicated that the two specific indirect effects were of similar size.  
17  
18  
19  
20

21 Direct effects for Danish couples were similar to the Norwegian sample, with one  
22  
23 important exception. The association between male partner's intimacy and his reported frequency  
24  
25 of sexual intercourse was non-significant. No indirect effects of coital frequency were observed.  
26  
27 Belgian couples differed from Danish in that the levels of female partners' emotional intimacy  
28  
29 did not predict her reported coital frequency. We observed significant partner-specific indirect  
30  
31 effects in Belgian couples, with coital frequency mediating the association between male  
32  
33 partner's emotional intimacy and female partner's sexual well-being.  
34  
35  
36  
37

38 In the Portuguese sample, we found no significant partner effects. Male partner's reported  
39  
40 intimacy did not predict either his female partner reported coital frequency or her sexual well-  
41  
42 being—unlike in the other three countries. Actor effects, however, were significant in both  
43  
44 genders. Frequency of sexual intercourse significantly mediated the relationship between  
45  
46 emotional intimacy and sexual well-being only in male partners. The size of this indirect effect  
47  
48 was substantially smaller than observed among Norwegian men.  
49  
50  
51  
52

53 Across countries, effect sizes for the association between actor's intimacy and coital  
54  
55 frequency were higher among male than female partners. In contrast, the association between  
56  
57 actor's frequency of sexual intercourse and sexual well-being was similarly strong in both  
58  
59 genders.  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 The proportion of variance in male sexual well-being explained by the APIM model  
5  
6 (Figure 2) ranged from 55% in Portugal to 78% in Norway. In female participants, the explained  
7  
8 variance in sexual well-being ranged from 63% in Portugal to 75% in Belgium.  
9

10  
11 -----  
12  
13 TABLE 4 ABOUT HERE  
14  
15  
16 -----  
17

## 18 DISCUSSION

19  
20 To fill a gap in research on aging couples' sexuality, this cross-cultural study used a  
21  
22 dyadic approach to investigate the connections among emotional intimacy, frequency of sexual  
23  
24 intercourse, and sexual well-being. The study had two specific aims. First, we wished to extend  
25  
26 previous validation of the 5-dimensional model of aging individuals' sexual well-being  
27  
28 (Štulhofer et al., 2018) using cross-cultural dyadic data. Secondly, we aimed to explore the  
29  
30 association between couples' emotional intimacy and sexual well-being, and the mediating role  
31  
32 of the frequency of sexual intercourse. Unlike intimacy, the role of sexual frequency has been  
33  
34 unclear, if not ambiguous, in the context of aging individuals' sexuality (Sandberg 2013; Müller  
35  
36 et al. 2014; Lee et al. 2016; Fileborn et al. 2017).  
37  
38  
39  
40  
41  
42

43 In regard to the overall structure of relationships among emotional intimacy, sexual  
44  
45 activity and sexual well-being, country-by-country structural equation APIM analyses pointed to  
46  
47 a number of consistent and significant actor effects. For example, intimacy and frequency of  
48  
49 sexual intercourse predicted both male and female partners' sexual well-being. Partner effects  
50  
51 were notably weaker and gender-specific. Female partners' emotional intimacy did not predict  
52  
53 their male partners' frequency of sex and sexual well-being. In contrast, male partners' intimacy  
54  
55 significantly predicted female partners' sexual well-being in three of the four countries. The  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 relationship was non-significant in the most religious and least educated sample in this study  
5  
6 (Portugal).  
7

8  
9       Marked gender-specific differences in partner effects found in this study need to be  
10 considered in the context of a more traditional gender role socialization and social regulation of  
11 sexuality which was common at the time our participants were emerging adults (see Francoeur  
12 and Noonan 2004; Herzog 2011). When thinking about more traditional gender roles, which  
13 regard “emotion work” as mostly women’s responsibility (men are, instead, expected to control  
14 their feelings; (Brody and Hall 2008; Fahs and Swank 2016), it may be surprising that men’s but  
15 not women’s reports of intimacy were predictive of the other partner’s sexual well-being.  
16  
17 However, this is not incompatible with traditional gender roles. Male emotional intimacy may be  
18 valued highly precisely because, at least in its expression, it is less frequent than female  
19 emotional intimacy. Also, partner variables (including intimacy) seem more systematically  
20 related to female than male sexuality, even on a daily basis (see Dewitte and Mayer 2018),  
21 although it is unclear to what extent this applies to different age groups.  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37

38       We also explored whether the frequency of sexual intercourse mediated the link between  
39 emotional intimacy on sexual well-being. We recognize the possibility that emotional intimacy  
40 could mediate the association between sexual activity and sexual well-being, but given that the  
41 tendency to have sex for physical and utilitarian motives seems to decrease with increasing age  
42 (e.g., Wyverkens et al. 2018) we were more interested in exploring models that take emotional  
43 intimacy as a starting point. Moreover, although the degree of intimacy experienced during  
44 sexual activity can be expected to vary (within and between individuals) and this in itself could  
45 influence sexual well-being, we measured emotional intimacy at a more global level. For these  
46 reasons, we considered it both more relevant and more interesting to explore the degree to which  
47 it might influence sexual activity and, indirectly, sexual well-being.  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 This mediation model was supported in male partners from Norway and Portugal, as well  
5  
6 as in female partners from Norway and Belgium. The actor-specific indirect effects were notably  
7  
8 stronger in male compared to female partners, suggesting that the frequency of sexual intercourse  
9  
10 plays a more important role for older coupled men's than women's sexual well-being. For  
11  
12 example, the mediation was about twice as strong in Norwegian men than their female partners.  
13  
14 Partner-specific indirect effects, where male partner's emotional intimacy contributed to his  
15  
16 female partner's sexual well-being through more frequent sex, were observed only in female  
17  
18 Norwegian participants. Whether the fact that this indirect effect was found only in Norway can  
19  
20 be attributed to a high level of gender equality achieved in this country or to some other culture-  
21  
22 specific characteristics that were not assessed in this study is unclear.  
23  
24  
25  
26  
27

28 This study's findings provided additional support for the validity of the sexual well-being  
29  
30 model, as applied to aging couples. Although the overall structure of the model did not differ  
31  
32 among countries, differences were found in mean levels of various facets of sexual well-being,  
33  
34 which suggested some culture-specific influences on aging couples' sexual well-being to be  
35  
36 explored in future research. Interestingly, distress about one or more sexual difficulties was  
37  
38 consistently higher among older women than men in the four countries (not presented in tables),  
39  
40 which is consistent with findings in younger samples (Fugl-Meyer and Fugl-Meyer 1999;  
41  
42 Hendrickx et al. 2014). For example, in a sample of 35,132 Flemish heterosexual men and  
43  
44 women (mean age was 39 years), Hendrickx et al. (2014) found that 20% of women and 11% of  
45  
46 men reported at least one distressful sexual difficulty.  
47  
48  
49  
50  
51

52 Taking into account its robust cross-cultural performance, our 5-dimensional model of  
53  
54 sexual well-being may be a useful tool in clinical and non-clinical studies of older individuals'  
55  
56 and couples' sexuality and sexual health. If our composite indicator of distress over sexual  
57  
58 function (the original distress items were sexual difficulty-specific) is replaced with a general  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 single-item indicator, which is the standard practice in large-scale sexological studies (e.g., Jones  
5  
6 et al. 2015), the sexual well-being measure would be represented by only eight items in total,  
7  
8 which most surveys—including those that do not focus on sexual aspects of aging—would not  
9  
10 have a problem accommodating. Apart from being practical to use, this newly-developed sexual  
11  
12 well-being measure might provide insight into components of and processes that underlie sexual  
13  
14 well-being in older individuals and couples, including in longitudinal studies. In clinical settings,  
15  
16 our measure might assist in identifying and addressing particular individual emotional and erotic  
17  
18 needs, as well as shortcomings in the couple’s habitual sexual “choreography”.  
19  
20  
21  
22

### 23 **Study Limitations**

24  
25  
26 The cross-sectional nature of our study does not warrant any discussion about causal  
27  
28 links. The direction of paths in the structural mediation model was assumed, based on our  
29  
30 conceptual framework, and not empirically determined. The relationship between the constructs  
31  
32 might go in either direction, including a number of likely bi-directional ties. Our study  
33  
34 recruitment presents another limitation. Sexually active couples, as well as those with more  
35  
36 liberal views about sexuality, were likely oversampled at the expense of sexually inactive and  
37  
38 more traditional (possibly more religious) couples. Taking into account country-specific  
39  
40 participation rates and proportion of participants living in (usually more liberal) large urban  
41  
42 settings, such bias was probably most substantial in the case of Portugal. Overall, this  
43  
44 substantially limits the generalizability of our findings. Despite the robustness of APIM  
45  
46 estimations, the country samples (especially the Portuguese) were underpowered when  
47  
48 associations were small. This limitation needs to be considered particularly when partner effects  
49  
50 are addressed. Finally, although the structure and levels of sexual well-being differ in  
51  
52 heterosexual and non-heterosexual couples, the fact that only one person in our overall sample  
53  
54 identified as gay or lesbian, while three others reported that they were bisexual (an additional 17  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 checked the category “other”) precluded any meaningful statistical treatment of sexual  
5  
6 orientation.  
7

## 8 9 CONCLUSIONS AND IMPLICATIONS

10  
11 This dyadic study aimed to contribute to an emerging interest in positive aspects of sexual  
12 aging. Apart from providing additional cross-cultural validation of a newly-developed measure of  
13 sexual well-being, which suggested some unmeasured culture-specific influences, we observed  
14 consistent associations among emotional intimacy, frequency of sexual intercourse, and sexual  
15 well-being separately for both men and women. In contrast to these actor effects, partner effects,  
16 were inconsistent and gender-specific (i.e., the absence of female-to-male partner influence),  
17 pointing to a likely role of more traditional gender role socialization that may have been the norm  
18 at the time our participants were growing up. As emphasized in a recent review of research on  
19 sexuality in older age (Træen et al., 2017b), the field may greatly benefit from comparative  
20 research into the role of sociocultural norms and beliefs on sexual functioning and sexual well-  
21 being of older people.  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37

38 Finally, our study has a couple of clinical implications. Older couples’ emotional  
39 intimacy, particularly when expressed by the male partner, was found to play an important role in  
40 both partners’ sexual well-being. Whether this is an age-dependent process, whereby aging  
41 moderates (particularly in men?) the strength of the association between emotional closeness and  
42 sexual well-being, is unclear and requires additional research. In addition, sexual intercourse,  
43 which likely occupies a less central place in older couples’ sexual repertoire compared to younger  
44 couples, remains an independent contributor to both female and male sexual well-being. This  
45 needs to be considered when working with couples characterized by sexual health problems, as  
46 professional assistance in re-defining the couple’s notion of sex may be needed.  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 **ACKNOWLEDGEMENT**  
5

6           This research was fully financed by the Norwegian Research Council under the grant  
7  
8  
9 number 250637.  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

## LIST OF REFERENCES

- Abraham L, Symonds T, Morris MF (2008) Psychometric Validation of a Sexual Quality of Life Questionnaire for Use in Men with Premature Ejaculation or Erectile Dysfunction. *J Sex Med* 5:595–601. doi: 10.1111/j.1743-6109.2007.00749.x
- Anderson AB, Rosen NO, Price L, Bergeron S (2016) Associations Between Penetration Cognitions, Genital Pain, and Sexual Well-being in Women With Provoked Vestibulodynia. *J Sex Med* 13:444–452. doi: 10.1016/j.jsxm.2015.12.024
- Arbuckle JL (2013) IBM AMOS 22 User’s Guide. Amos Development Corporation, Mount Pleasant, SC
- Bancroft J, Loftus J, Long JS (2003) Distress about sex: a national survey of women in heterosexual relationships. *Arch Sex Behav* 32:193–208. doi: 10.1023/A:1023420431760
- Bancroft J, Long JS, McCabe J (2011) Sexual Well-Being: A Comparison of U.S. Black and White Women in Heterosexual Relationships. *Arch Sex Behav* 40:725–740. doi: 10.1007/s10508-010-9679-z
- Bell S, Reissing ED, Henry LA, Van Zuylen H (2017) Sexual Activity After 60: A Systematic Review of Associated Factors. *Sex Med Rev* 5:52–80. doi: 10.1016/J.SXMR.2016.03.001
- Brody LR, Hall JA (2008) Gender and Emotion in Context. In: Lewis M, Haviland-Jones JM, Feldman Barrett L (eds) *Handbook of Emotions*, 3rd edn. The Guilford Press, New York, pp 395–408
- Bryne BM, Shavelson RJ, Muthén B (1998) Testing for the wquivalence of fator covariance and mean structure : The issue of partial measurement in variance. *Psychol Bull* 105:456–466. doi: 10.1037/0033-2909.105.3.456

- 1  
2  
3  
4 Byrne BM (2010) Structural equation modeling with AMOS : basic concepts, applications, and  
5  
6 programming. Routledge, New York  
7  
8
- 9 Costa P, Arnould B, Cour F, Boyer P, Marrel A, Jaudinot EO, Solesse de Gendre A (2003)  
10  
11 Quality of Sexual Life Questionnaire (QVS): a reliable, sensitive and reproducible  
12  
13 instrument to assess quality of life in subjects with erectile dysfunction. *Int J Impot Res*  
14  
15 15:173–184. doi: 10.1038/sj.ijir.3900995  
16  
17
- 18 De Visser RO, Rissel CE, Richters J, Smith AMA, De Visser RO, Rissel CE, Richters J, Smith  
19  
20 AMA (2007) The Impact of Sexual Coercion on Psychological, Physical, and Sexual Well-  
21  
22 Being in a Representative Sample of Australian Women. *Arch Sex Behav* 36:676–686. doi:  
23  
24 10.1007/s10508-006-9129-0  
25  
26
- 27 DeLamater J (2012) Sexual Expression in Later Life: A Review and Synthesis. *J Sex Res*  
28  
29 49:125–141. doi: 10.1080/00224499.2011.603168  
30  
31
- 32 Dewitte M, Mayer A (2018) Exploring the Link Between Daily Relationship Quality, Sexual  
33  
34 Desire, and Sexual Activity in Couples. *Arch Sex Behav* 47:1675–1686. doi:  
35  
36 10.1007/s10508-018-1175-x  
37  
38
- 39 Fahs B, Swank E (2016) The Other Third Shift?: Women’s Emotion Work in Their Sexual  
40  
41 Relationships. *Fem Form* 28:46–69. doi: 10.1353/ff.2016.0043  
42  
43
- 44 Fileborn B, Brown G, Lyons A, Hinchliff S, Heywood W, Minichiello V, Malta S, Barrett C,  
45  
46 Crameri P (2017) Safer Sex in Later Life: Qualitative Interviews With Older Australians on  
47  
48 Their Understandings and Practices of Safer Sex. *J Sex Res* 4499:1–14. doi:  
49  
50 10.1080/00224499.2017.1280121  
51  
52
- 53 Fisher L, Anderson GO, Chapagain M, Mentenegro X, Smoot J, Takalkar A (2010) Sex,  
54  
55 Romance, and Relationships: AARP Survey of Midlife and Older Adults. Washington, DC  
56  
57
- 58 Francoeur RT, Noonan RJ (2004) The continuum complete international encyclopedia of  
59  
60  
61  
62  
63  
64  
65

1  
2  
3  
4 sexuality. Continuum, New York, NY, US

5  
6  
7 Freak-Poli R, Kirkman M, De Castro Lima G, Direk N, Franco OH, Tiemeier, H (2017) Sexual  
8  
9 activity and psysical tenderness in older adults: Cross-sectional prevalence and associated  
10  
11 characteristics. *J Sex Med* 14: 918-927. doi: 10.1016/j.jsxm.2017.05.010.  
12

13  
14 Fugl-Meyer AR, Fugl-Meyer LS (1999) Sexual disabilities, problems and satisfaction in 18-74  
15  
16 year old Swedes. *Scand J Sexol* 2:79–105.  
17

18  
19 Graf AS, Patrick JH (2014) The Influence of Sexual Attitudes on Mid-to Late-Life Sexual Well-  
20  
21 Being: Age, Not Gender, as a Salient Factor. *Int J Aging Hum Dev* 79:55–79. doi:  
22  
23 10.2190/AG.79.1.c  
24

25  
26 Graham JW (2012) *Missing data : analysis and design*. Springer-Verlag, New York

27  
28 Heiman JR, Long JS, Smith SN, Fisher WA, Sand MS, Rosen RC (2011) Sexual Satisfaction and  
29  
30 Relationship Happiness in Midlife and Older Couples in Five Countries. *Arch Sex Behav*  
31  
32 40:741–753. doi: 10.1007/s10508-010-9703-3  
33  
34

35  
36 Hendrickx L, Gijs L, Enzlin P (2015) Age-Related Prevalence Rates of Sexual Difficulties,  
37  
38 Sexual Dysfunctions, and Sexual Distress in Heterosexual Women: Results from an Online  
39  
40 Survey in Flanders. *J Sex Med* 12:424–435. doi: 10.1111/jsm.12725  
41  
42

43  
44 Hendrickx L, Gijs L, Enzlin P (2014) Prevalence Rates of Sexual Difficulties and Associated  
45  
46 Distress in Heterosexual Men and Women: Results From an Internet Survey in Flanders. *J*  
47  
48 *Sex Res* 51:1–12. doi: 10.1080/00224499.2013.819065  
49

50  
51 Herzog D (2011) *Sexuality in Europe : a twentieth-century history*. Cambridge University Press

52  
53 Janssen E, McBride KR, Yarber W, Hill BJ, Butler SM (2008) Factors that Influence Sexual  
54  
55 Arousal in Men: A Focus Group Study. *Arch Sex Behav* 37:252–265. doi: 10.1007/s10508-  
56  
57 007-9245-5  
58

59  
60 Jones KG, Mitchell KR, Ploubidis GB, Wellings K, Datta J, Johnson AM, Mercer CH (2015) The  
61  
62  
63  
64  
65

1  
2  
3  
4 Natsal-SF Measure of Sexual Function: Comparison of Three Scoring Methods. *J Sex Res*  
5  
6 52:640–646. doi: 10.1080/00224499.2014.985813  
7

8  
9 Kenny DA, Kashy DA, Cook WL (2006) *Dyadic data analysis*. Guilford Press

10  
11 Kleinstäuber M (2017) Factors associated with sexual health and well being in older adulthood.  
12  
13 *Curr Opin Psychiatry* 30:358–368. doi: 10.1097/YCO.0000000000000354  
14

15  
16 Laumann EO, Paik A, Glasser DB, Kang J-H, Wang T, Levinson B, Moreira ED, Nicolosi A,  
17  
18 Gingell C (2006) A Cross-National Study of Subjective Sexual Well-Being Among Older  
19  
20 Women and Men: Findings From the Global Study of Sexual Attitudes and Behaviors. *Arch*  
21  
22 *Sex Behav* 35:145–161. doi: 10.1007/s10508-005-9005-3  
23  
24

25  
26 Lee DM, Nazroo J, O’Connor DB, Blake M, Pendleton N (2016) Sexual Health and Well-being  
27  
28 Among Older Men and Women in England: Findings from the English Longitudinal Study  
29  
30 of Ageing. *Arch Sex Behav* 45:133–144. doi: 10.1007/s10508-014-0465-1  
31  
32

33  
34 Lindau ST, Schumm LP, Laumann EO, Levinson W, O’Muircheartaigh CA, Waite LJ (2007) A  
35  
36 Study of Sexuality and Health among Older Adults in the United States. *N Engl J Med*  
37  
38 357:762–774. doi: 10.1056/NEJMoa067423  
39

40  
41 Ménard AD, Kleinplatz PJ, Rosen L, Lawless S, Paradis N, Campbell M, Huber JD (2015)  
42  
43 Individual and relational contributors to optimal sexual experiences in older men and  
44  
45 women. *Sex Relatsh Ther* 30:78–93. doi: 10.1080/14681994.2014.931689  
46  
47

48  
49 Mitchell KR, Mercer CH, Ploubidis GB, Jones KG, Datta J, Field N, Copas AJ, Tanton C, Erens  
50  
51 B, Sonnenberg P, Clifton S, Macdowall W, Phelps A, Johnson AM, Wellings K (2013)  
52  
53 Sexual function in Britain: findings from the third National Survey of Sexual Attitudes and  
54  
55 Lifestyles (Natsal-3). *Lancet* 382:1817–1829. doi: 10.1016/S0140-6736(13)62366-1  
56

57  
58 Muise A, Maxwell JA, Impett EA (2018) What Theories and Methods From Relationship  
59  
60 Research Can Contribute to Sex Research. *J Sex Res* 55:540–562. doi:  
61  
62  
63  
64  
65

1  
2  
3  
4 10.1080/00224499.2017.1421608  
5

6 Muise A, Preyde M, Maitland SB, Milhausen RR (2010) Sexual Identity and Sexual Well-Being  
7  
8 in Female Heterosexual University Students. *Arch Sex Behav* 39:915–925. doi:

9  
10  
11 10.1007/s10508-009-9492-8  
12

13 Müller B, Nienaber CA, Reis O, Kropp P, Meyer W (2014) Sexuality and Affection among  
14  
15 Elderly German Men and Women in Long-Term Relationships: Results of a Prospective  
16  
17 Population-Based Study. *PLoS One* 9:e111404. doi: 10.1371/journal.pone.0111404  
18  
19

20 Murray SH, Milhausen RR, Graham CA, Kuczynski L (2017) A Qualitative Exploration of  
21  
22 Factors That Affect Sexual Desire Among Men Aged 30 to 65 in Long-Term Relationships.  
23  
24  
25  
26  
27 *J Sex Res* 54:319–330. doi: 10.1080/00224499.2016.1168352

28 Neto F (2012) The Satisfaction With Sex Life Scale. *Meas Eval Couns Dev* 45:18–31. doi:

29  
30  
31 10.1177/0748175611422898  
32

33 Öberg K, Fugl-Meyer KS, Fugl-Meyer AR (2002) On sexual well-being in sexually abused  
34  
35 Swedish women: Epidemiological aspects. *Sex Relatsh Ther* 17:329–341. doi:

36  
37  
38 10.1080/1468199021000017182  
39

40 Pascoal PM, Narciso I de SB, Pereira NM (2014) What is sexual satisfaction? Thematic analysis  
41  
42 of lay people's definitions. *J Sex Res* 51:22–30. doi: 10.1080/00224499.2013.815149  
43  
44

45 Peixoto MM, Nobre P (2015) Prevalence and Sociodemographic Predictors of Sexual Problems  
46  
47 in Portugal: A Population-Based Study With Women Aged 18 to 79 Years. *J Sex Marital*  
48  
49 *Ther* 41:169–180. doi: 10.1080/0092623X.2013.842195  
50  
51

52 Rosen RC, Bachmann G a (2008) Sexual well-being, happiness, and satisfaction, in women: The  
53  
54 case for a new conceptual paradigm. *J Sex Marital Ther* 34:291–307. doi:

55  
56  
57 10.1080/00926230802096283  
58

59 Rosen RC, Bachmann GA, Reese JB, Gentner L, Leiblum S, Wajszczuk C, Wanser R (2009)  
60  
61  
62  
63  
64  
65

- 1  
2  
3  
4 Female sexual well-being scale (FSWB Scale): Development and psychometric validation in  
5 sexually functional women. *J Sex Med* 6:1297–1305. doi: 10.1111/j.1743-  
6  
7  
8  
9 6109.2009.01240.x
- 10  
11 Sandberg L (2013) Just feeling a naked body close to you: Men, sexuality and intimacy in later  
12  
13 life. *Sexualities* 16:261–282. doi: 10.1177/1363460713481726
- 14  
15  
16 Santos-Iglesias P, Byers ES, Moglia R (2016) Sexual well-being of older men and women. *Can J*  
17  
18  
19 *Hum Sex* 25:86–98. doi: 10.3138/cjhs.252-A4
- 20  
21 ShROUT PE, Bolger N (2002) Mediation in Experimental and Nonexperimental Studies : New  
22  
23  
24 Procedures and Recommendations Mediation in Experimental and Nonexperimental  
25  
26 Studies : New Procedures and Recommendations. *Psychol Methods* 7:422–445. doi:  
27  
28  
29 10.1037/1082-989X.7.4.422
- 30  
31 Sinclair VG, Dowdy SW (2005) Development and validation of the Emotional Intimacy Scale. *J*  
32  
33  
34 *Nurs Meas* 13:193–206.
- 35  
36 Stephenson KR, Meston CM, Rosen R, Derogatis L, Fourcroy J, Fugl-Meyer K, Lu T, Lu M, Liu  
37  
38  
39 V (2010) Differentiating components of sexual well-being in women: are sexual satisfaction  
40  
41  
42 and sexual distress independent constructs? *J Sex Med* 7:2458–2468. doi: 10.1111/j.1743-  
43  
44  
45 6109.2010.01836.x
- 46  
47 Syme ML, Cohn TJ, Stoffregen S, Kaempfe H, Schippers D (2018) “At My Age ... ”: Defining  
48  
49  
50 Sexual Wellness in Mid- and Later Life. *J Sex Res* 1–11. doi:  
51  
52  
53 10.1080/00224499.2018.1456510
- 54  
55 Štulhofer A, Jurin T, Graham C, Enzlin P, Træen B (2018) Sexual well-being in older men and  
56  
57  
58 women: Construction and validation of a multi-dimensional measure of four European  
59  
60  
61 countries. *J Happiness Stud*. doi: 0.1007/s10902-018-0049-1
- 62  
63  
64 Træen B, Hald GM, Graham CA, Enzlin P, Janssen E, Kvaalem IL, Carvalheira A, Štulhofer A  
65

- 1  
2  
3  
4 (2017) Sexuality in Older Adults (65+)—An Overview of the Literature, Part 1: Sexual  
5  
6 Function and its Difficulties. *Int J Sex Heal* 29:1–10. doi: 10.1080/19317611.2016.1224286  
7  
8  
9 Træen B, Štulhofer A, Janssen E, Carvalheira AA, Hald GM, Lange T, Graham C (2018) Sexual  
10  
11 activity and sexual satisfaction among older adults in four European Countries. *Arch Sex*  
12  
13 *Behav.* doi: 10.1007/s10508-018-1256-x  
14  
15  
16 Trudel G, Dargis L, Villeneuve L, Cadieux J, Boyer R, Prévile M (2014) Marital, sexual and  
17  
18 psychological functioning of older couples living at home: The results of a national survey  
19  
20 using longitudinal methodology (Part II). *Sexologies* 23:e35–e48. doi:  
21  
22 10.1016/J.SEXOL.2013.03.007  
23  
24  
25  
26 van de Schoot R, Lugtig P, Hox J (2012) A checklist for testing measurement invariance. *Eur J*  
27  
28 *Dev Psychol* 9:486–492. doi: 10.1080/17405629.2012.686740  
29  
30  
31 Waite LJ, Laumann EO, Das A, Schumm LP (2009) Sexuality: measures of partnerships,  
32  
33 practices, attitudes, and problems in the National Social Life, Health, and Aging Study. *J*  
34  
35 *Gerontol B Psychol Sci Soc Sci* 64B:i56–i66. doi: 10.1093/geronb/gbp038  
36  
37  
38 Wang V, Depp CA, Ceglowski J, Thompson WK, Rock D, Jeste D V. (2015) Sexual Health and  
39  
40 Function in Later Life: A Population-Based Study of 606 Older Adults with a Partner. *Am J*  
41  
42 *Geriatr Psychiatry* 23:227–233. doi: 10.1016/j.jagp.2014.03.006  
43  
44  
45  
46 Wyverkens E, Dewitte M, Deschepper E, Corneillie J, Van der Bracht L, Van Regenmortel D,  
47  
48 Van Cleempoel K, De Boose N, Prinssen P, T’Sjoen G (2018) YSEX? A Replication Study  
49  
50 in Different Age Groups. *J Sex Med* 15:492–501. doi: 10.1016/j.jsxm.2018.02.012  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65

Figure 1 – The Model of Couple’s Sexual Well-Being

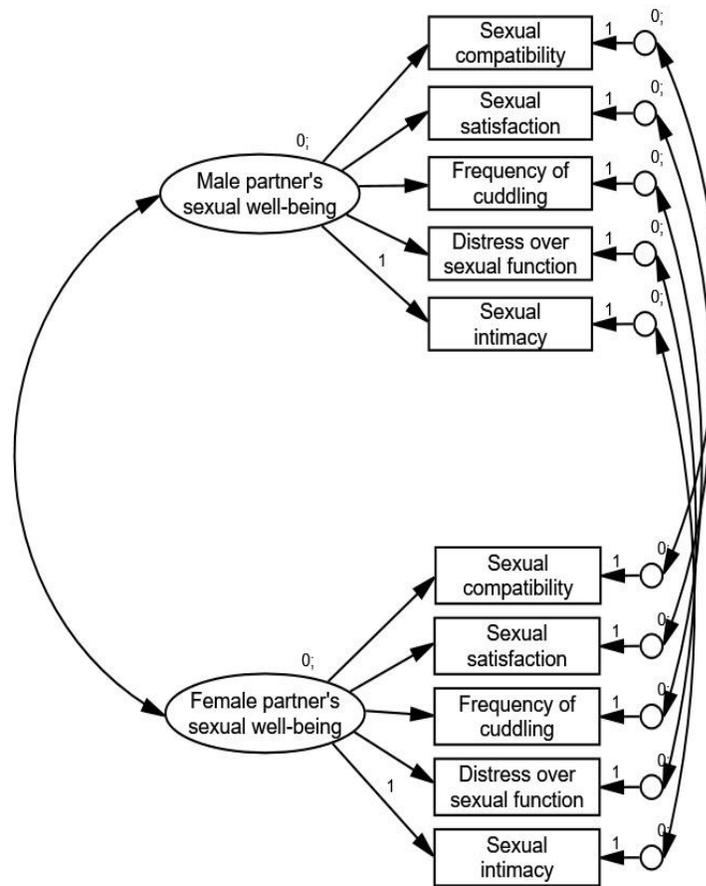
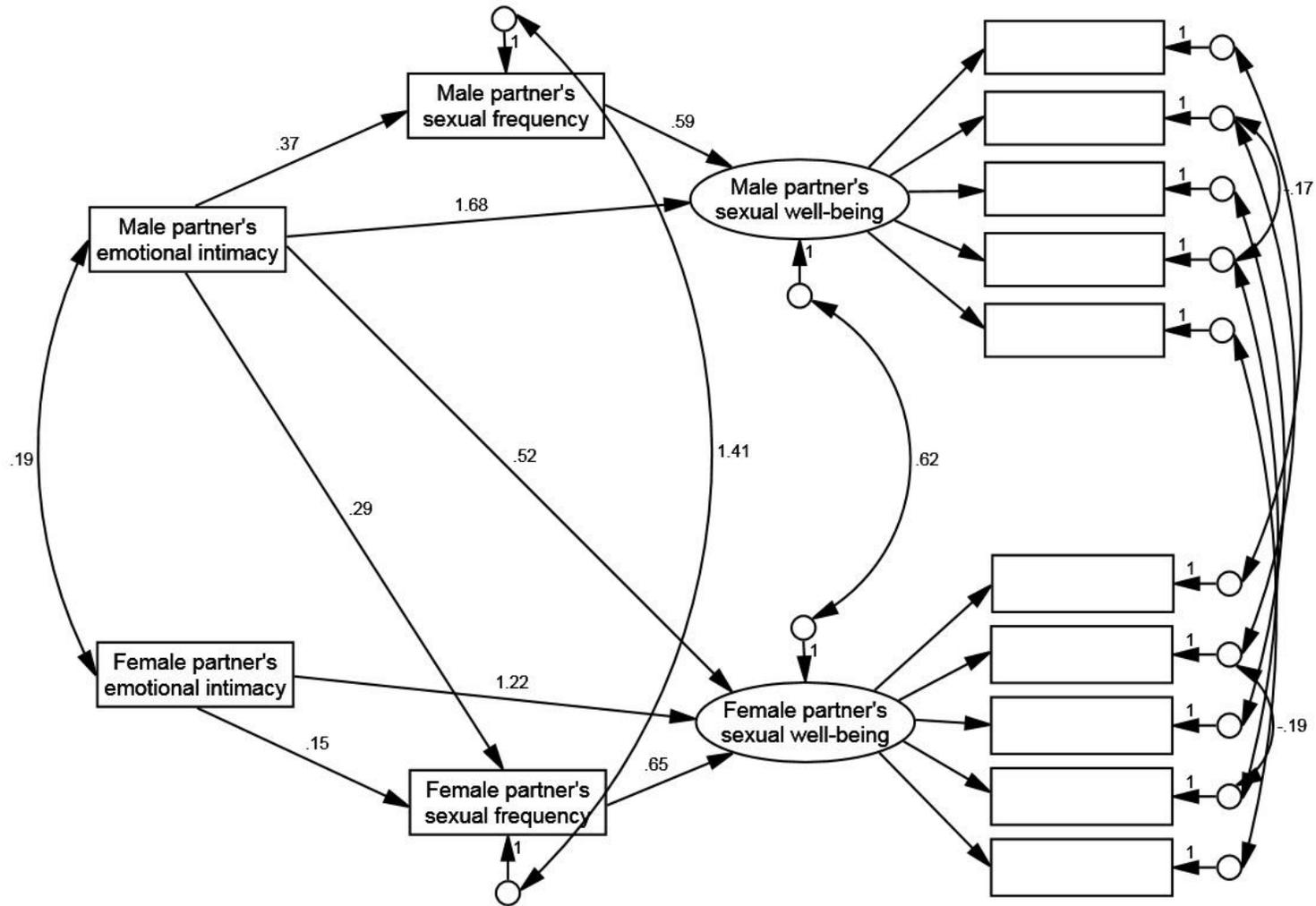


Figure 2 – Final Path Analytic Actor-Partner Interdependence Model ( $n = 677$ )



Notes. All paths (unstandardized path coefficients are presented) and structural covariances significant at  $p < .05$

Table 1 – Basic Sociodemographic Characteristics of the Dyadic Sample (by Country)

	Norway		Denmark		Belgium		Portugal		
	Male	Female	Male	Female	Male	Female	Male	Female	
	partner	partner	partner	partner	partner	partner	partner	partner	
	<i>n</i> (%)		<i>n</i> (%)		<i>n</i> (%)		<i>n</i> (%)		
<b>Age</b>									
60-65	57 (26.1)	93 (42.7)	59 (28.5)	78 (37.7)	38 (28.1)	66 (48.9)	50 (42.7)	72 (61.5)	
66-70	85 (39.0)	86 (39.4)	73 (35.3)	90 (43.5)	60 (44.4)	48 (35.6)	42 (35.9)	35 (29.9)	
71-75	76 (34.9)	39 (17.9)	75 (36.2)	39 (18.8)	37 (27.4)	21 (15.6)	25 (21.4)	10 (8.5)	
<b>Education</b>									
primary	26 (11.9)	17 (7.8)	59 (28.9)	50 (24.3)	17 (15.6)	25 (18.6)	38 (32.5)	50 (42.7)	
secondary	65 (29.8)	87 (40.1)	72 (35.3)	79 (38.3)	72 (50.3)	71 (52.9)	62 (53.0)	47 (40.2)	
tertiary	127 (58.3)	113 (52.1)	73 (35.8)	77 (37.4)	46 (34.1)	38 (28.4)	17 (14.5)	20 (17.1)	
<b>Relationship duration</b>									
≤ 10 years	26 (6.6)		26 (6.5)		26 (10.2)		46 (22.1)		
11-20 years	28 (7.1)		10 (2.5)		6 (2.3)		8 (3.8)		
21-30 years	34 (8.6)		24 (6.0)		12 (4.7)		18 (8.7)		
≥ 31 years	306 (77.7)		338 (84.9)		164 (82.8)		136 (65.4)		
<b>Religious attendance</b>									

Never	78 (35.9)	66 (30.7)	65 (31.9)	52 (25.4)	50 (37.0)	51 (38.9)	29 (25.4)	23 (20.2)
Less than once a year	50 (23.0)	47 (21.9)	50 (24.5)	54 (26.3)	21 (15.6)	11 (8.4)	18 (15.8)	14 (12.3)
Once or twice a year	62 (28.6)	71 (33.0)	65 (31.9)	67 (32.7)	33 (24.4)	41 (31.3)	32 (28.1)	22 (19.3)
On a monthly basis	16 (7.4)	21 (9.8)	19 (9.3)	27 (13.2)	22 (16.3)	19 (16.0)	19 (16.7)	28 (24.6)
Once a week or more often	11 (5.1)	10 (4.7)	5 (2.5)	5 (2.4)	9 (6.7)	7 (5.3)	16 (14.0)	27 (23.7)

Place of residence

Village	138 (31.7)	162 (39.5)	60 (23.1)	22 (9.6)
Small town	162 (37.2)	134 (32.7)	140 (53.8)	60 (26.3)
Medium sized town	48 (11.0)	56 (13.7)	36 (13.8)	44 (19.3)
Suburb of a large city	38 (8.7)	40 (9.8)	16 (6.2)	34 (14.9)
Metropolitan city	50 (11.5)	18 (4.4)	8 (3.1)	68 (29.8)

---

Table 2 – Means and Standard Deviations of the Key Indicators by Country and Partner

	Norway		Denmark		Belgium		Portugal	
	Male	Female	Male	Female	Male	Female	Male	Female
	partner	partner	partner	partner	partner	partner	partner	partner
	<i>M</i> (SD)		<i>M</i> (SD)		<i>M</i> (SD)		<i>M</i> (SD)	
Emotional intimacy	1.71 (.61)	1.69 (.66)	1.68 (.63)	1.66 (.64)	1.79 (.67)	1.75 (.71)	1.68 (.66)	1.72 (.77)
Frequency of sexual intercourse	2.78 (1.43)	2.74 (1.36)	2.66 (1.35)	2.55 (1.39)	2.60 (1.30)	2.43 (1.33)	3.06 (1.41)	2.80 (1.45)
	<i>M</i> (S.E.)		<i>M</i> (S.E.)		<i>M</i> (S.E.)		<i>M</i> (S.E.)	
Sexual well-being	4.60 (.05)	4.48 (.05)	4.59 (.06)	4.46 (.08)	4.38 (.08)	4.33 (.08)	4.40 (.09)	4.30 (.09)

Table 3 – Model Fit and Invariance Evaluation Information

	$\chi^2$ (df)	CFI	$\Delta$ CFI	RMSEA	RMSEA 90% CI <sup>a</sup>
Total sample	92.71 (29)	.959		.057	.044-.070
Multi-group model by country, unconstrained	195.53 (116)	.951		.032	.024-.040
Multi-group model, partial metric invariance	207.39 (129)	.951	.000	.030	.023-.038

Notes. <sup>a</sup> Confidence interval

Table 4 – Associations among Emotional Intimacy, Frequency of Sexual Intercourse and Sexual Well-Being in Couples from Four European Countries (Path Analytic APIM)

	Norway	Denmark	Belgium	Portugal
	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)
Male intimacy to Male sexual well-being	1.45*** (.22)	1.91*** (.24)	2.71*** (.48)	1.39*** (.24)
Male intimacy to Male frequency of sexual intercourse	.59*** (.16)	.24 (.15)	.13 (.17)	.59** (.20)
Male frequency of sexual intercourse to Male sexual well-being	.87*** (.16)	.59*** (.09)	.34** (.11)	.48*** (.20)
Male intimacy to Female frequency of sexual intercourse	.30 (.16)	.23 (.16)	.33 (.18)	.29 (.22)

Male intimacy to	.54** (.20)	.83*** (.20)	.75** (.27)	.01 (.22)
Female sexual well-being				
Female intimacy to	1.16*** (.19)	1.21*** (.20)	1.85*** (.35)	1.41*** (.21)
Female sexual well-being				
Female intimacy to	.19* (.09)	.20* (.10)	.18 (.13)	.11 (.14)
Female frequency of sexual intercourse				
Female frequency of sexual intercourse to	.82*** (.10)	.71*** (.10)	.49*** (.13)	.55*** (.10)
Female sexual well-being				

---

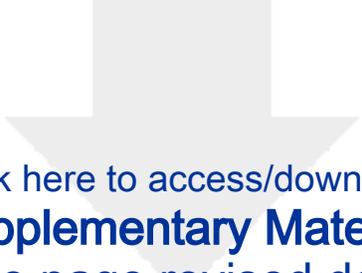
	Indirect effect 95% CI	Indirect effects 95% CI	Indirect effect 95% CI	Indirect effect 95% CI
Male intimacy to Male sexual well-being	.51 (.31-.78)**	.14 (-.02-.31)	.05 (-.03-.31)	.28 (.12-.57)**

---

Female intimacy to	.16 (.04-.28)*	.14 (.00-.28)	.09 (-.02-.36)	.06 (-.07-.18)
Female sexual well-being				
Male intimacy to	.25 (.06-.46)*	.16 (-.02-.37)	.16 (.03-.48)*	.16 (-.03-.42)
Female sexual well-being				

---

*Notes.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



Click here to access/download  
**Supplementary Material**  
Title page revised.docx

