

## Singles Not Sexually Satisfied? Prevalence and Predictors of Sexual Satisfaction in Single versus Partnered Adults

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### ABSTRACT

*Objective:* The present study assesses the importance of individual, sexual behavioral, and evaluative factors on sexual satisfaction among single and partnered adults. *Method:* Using data from a large web-sample of single ( $n = 1,075$ ) and partnered ( $n = 3,063$ ) individuals aged 18–89 from Norway. *Results:* Higher contentment with sexual activity, sexual intercourse frequency, satisfaction with singlehood, and relationship satisfaction predicted higher sexual satisfaction, across relationship status and sex. *Conclusions:* To tackle singlism and stereotypes about singles' sex lives, there is a need to further examine sexuality in singlehood.

### ARTICLE HISTORY

Received 7 March 2023  
Revised 22 July 2023  
Accepted 24 July 2023

### KEYWORDS



Sexual satisfaction; single; satisfaction with singlehood; relationship satisfaction

### Introduction

Sexual satisfaction is a key quality in many people's subjective well-being, and has been linked to people's life-satisfaction (Neto & Pinto, 2013, 2015; Velten & Margraf, 2017). Although research points to the significance of people's sexual satisfaction in both singlehood and romantic partnerships, scant interest has been shown in the factors that may facilitate satisfying sexual lives for singles (Park et al., 2021; Park & MacDonald, 2022). This is unfortunate, especially with an increasing population of singles around the globe (Kislev, 2021) – a trend that also has been observed in Norway according to Statistics Norway (SSB). Whilst in 1980, approximately 700,000 of the adult population in Norway was registered as single (about 24%), in 2020 the estimate of single adults had risen to about 1.4 million (33%) (singles were separated from those living in a relationship by using peoples reported family type and marital status in the old censuses and the new register data; Berrefjord Bergløff et al., 2021). In this study, singles will be defined as individuals who reported not being currently in a committed/permanent

relationship, including unmarried, separated, divorced, and widowed adults. Those who are married, cohabitating, have a registered partnership, or reported being in a current/permanent relationship are defined as partnered adults.

In the literature, sex life satisfaction is mainly explored within romantic relationships. The idea that sexual satisfaction is inherently dyadic is reflected in commonly used definitions, scales, models, and studied populations (for review, see Byers & Rehman, 2014; Freihart et al., 2020). In particular, the most common definition of sexual satisfaction defines it as “an affective response arising from one's subjective evaluation of the positive and negative dimensions associated with one's sexual relationship” (Lawrance & Byers, 1995, p. 268). In line with the dyadic framing, most research on sexual satisfaction assesses relationship status solely as a predictor/confounder of sexual satisfaction (Buczak-Stec et al., 2021; Cranney, 2017; Dekker et al., 2020), focuses only on individuals who report that they are partnered (Fischer et al., 2020; Frederick et al., 2017; Schmiedeberg & Schröder, 2016), or assesses dyadic samples (Fischer et al.,

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2021; Schoenfeld et al., 2017; Velten & Margraf, 2017; Vowels & Mark, 2020). These approaches fit with the general societal belief that one needs to be partnered to “live a full life.” Particularly, it is assumed that being partnered generates happiness and many advantages, including sexually (DePaulo & Morris, 2005). For example, recent research has shown that the inclusion of the other person into one’s self-concept, also described as relationship closeness, is positively associated with sexual satisfaction (Frost et al., 2017; Pietras et al., 2022).

Most Western societies portray partnership as being superior to singlehood. This is not only reflected in the pervasive stigmatizing of single adults (*singlism*) (DePaulo & Morris, 2005, 2006), but also manifests itself within the traditional sexual script, where sex is legitimized and symbolized by romantic love (DePaulo & Morris, 2005; Træen & Lewin, 2008). Based on these societal norms, it comes as no surprise that sexual satisfaction is investigated as a dyadic phenomenon. These societal norms are supported by evidence that shows that partnered adults are indeed more sexually satisfied than singles (Antičević et al., 2017; Buczak-Stec et al., 2021; Cranney, 2017; Dekker et al., 2020; Field et al., 2013). However, these findings are often undifferentiated and simplify our understanding of sex life satisfaction among single adults. First, although partnered adults are more satisfied with their sexual life than single adults, this does not necessarily mean that all singles are sexually dissatisfied (Park et al., 2021). Second, whilst there is extensive research concerning the factors that predict sexual satisfaction among partnered adults, these findings may not be transferable to single adults (Park & MacDonald, 2022). Given the differences of singles’ sexual realities and expectations, it is reasonable to assume that there may be distinct factors and variations in the relative importance of factors that constitute a satisfying sexual life for single adults. Third, despite the fact that singles represent a very heterogeneous group (Oh et al., 2022; Pepping et al., 2018), only recent studies have started to consider the importance of singles’ evaluations of their singlehood (e.g., voluntary/involuntary, contentment with being single) when assessing sexual satisfaction (Kislev, 2021; Park et al., 2021; Træen

& Kvaalem, 2022). As partnered adults’ evaluations of their relationships have been shown to be the most important predictor of sexual satisfaction (Byers & Rehman, 2014; Freihart et al., 2020; Rausch & Rettenberger, 2021), it is surprising that singles’ evaluations of their singlehood have been largely neglected.

In most cases, being partnered has a direct influence on individuals’ level of sexual activity (Kislev, 2020). Whilst frequent sexual interaction is an anticipated part of a romantic relationship, singles may often have only occasional and less reliable access to partnered sexual activity (e.g., hook ups, friends with benefits) (Furman & Shaffer, 2011; Regnerus et al., 2017). As frequent partnered sex is systematically and robustly linked to sexual satisfaction (Brody & Costa, 2009; Byers & Rehman, 2014; Freihart et al., 2020; McNulty et al., 2016; Rausch & Rettenberger, 2021; Schoenfeld et al., 2017), low sexual satisfaction among singles could largely be related to the unavailability of frequent partnered sexual activity (Kislev, 2020). Masturbation, on the other hand, is equally available to both single and partnered adults. However, despite being a healthy and pleasurable activity (Coleman, 2003; Rowland et al., 2020), many studies show a negative association between masturbation and sexual satisfaction (Bancroft et al., 2011; Brody & Costa, 2009; Fischer et al., 2022; Rowland et al., 2020; Velten & Margraf, 2017). One plausible explanation for this paradoxical relationship could be the behavior’s incompatibility with the prevailing love script (Fischer et al., 2022; Haus & Thompson, 2020; Træen & Lewin, 2008). In particular, the media often depicts masturbation as ambivalent, in some way problematic, and as a marker of romantic incompetence (Madanikia et al., 2013; Watson & McKee, 2013). A study investigating social norms associated with solo-sex found that, in 44 North American movies, most masturbation scenes depicted a young single man who had been caught while masturbating (Madanikia et al., 2013). The masturbation experience and outcome were mostly negative. Moreover, scenes depicting individuals in satisfying partnerships masturbating were lacking, and few of those movies showed women masturbating.

### **A bottom up approach**

A common concern in previous operationalizations of sexual satisfaction is the use of heterogeneous items as inherent indicators of the concept (e.g., frequency of sexual activity, sexual functioning, frequency of orgasm, desire for sexual activity) (Lawrance & Byers, 1995; Pascoal et al., 2014; Shaw & Rogge, 2016). This shortcoming has been described as predictor-criterion overlap and “occurs when a measure, rather than assessing sexual satisfaction directly, assesses constructs that predict or are predicted by sexual satisfaction (e.g., sexual function, intimacy) and uses those as direct indicators of sexual satisfaction” (Mark et al., 2014, p. 2). The prevailing conceptual diversification is problematic, as it confounds the concept of interest with its potential predictors (Mark et al., 2014; Shaw & Rogge, 2016). To prevent a predictor-criterion overlap, this study applied a “bottom-up” approach by exploring the relative and unique importance that specific domain satisfaction, in particular satisfaction with singlehood/relationship, sexual activity, body image, genital image, and sexual function, has on evaluative judgments of general sexual satisfaction. Sexual satisfaction will be defined as the “global positive and negative evaluations of one’s sex life” (Shaw & Rogge, 2016, p. 250; see also Neto, 2012); a comprehensive definition that applies to both single and partnered adults (Park & MacDonald, 2022).

### **Aims**

To date, research on singles’ sexual satisfaction is scarce. To the best of our knowledge, the present study is the first approach that assesses a broad array of predictors/correlates of sexual satisfaction for single individuals. Further, we examine the similar predictors/correlates of sexual satisfaction for partnered individuals. In this way, we may gain a better understanding of the different aspects that facilitate or hamper sexual satisfaction across individuals’ relationship statuses. If single adults rank differently for some factors than partnered adults, the findings would give us some indicators for how to boost sexual health among single adults. This is important due to (1)

an increasing population of singles (Kislev, 2021), (2) the lack of systematic research concerning singles’ sex life satisfaction (Park et al., 2021; Park & MacDonald, 2022), and (3) the fact that single individuals are often targets of stereotyping (DePaulo & Morris, 2005, 2006).

## **Method**

### **Procedure and sample**

This investigation uses data from a Norwegian study of sexuality, which collected information about the sociodemographic characteristics, sexual behavior, sexual health, and sexual functioning of the Norwegian population, aged 18–89 years. The sample is drawn by Norsk Gallup, a subsidiary of Kantar, which is an important supplier of analysis-based consultancy in Norway. Norsk Gallup collects survey data, and holds a web panel that includes about 40,000 people (GallupPanellet – Home). National phone registries, including mobiles and landlines, are used to obtain and maintain a representative online panel. As there is no possibility of self-recruitment, and because 94% of the Norwegian population uses the Internet daily (in 2020, Media statistics | Nordicom (gu.se)), the panel is broadly considered to be nationally representative of men and women in Norway. Ethical approval for studies conducted by Norsk Gallup Institutt and Kantar comply with the Personal Data Act and the guidelines of the Norwegian Data Protection Authority, as well as the ethical standards of ESOMAR and Norway’s Market Research Association. Further information on the procedure and the Gallup panel is reported elsewhere (Traeen et al., 2021).

In this investigation, we use data that was collected in March 2020. The survey was sent to 11,685 people (randomly recruited individuals from the Gallup Web Panel), of which 4,160 completed the survey (response rate = 36%). The total sample included 2,181 men (52.6%), with a mean age of 48.4 years ( $SD = 17.09$ ), and 1,967 women (47.4%), with a mean age of 44.4 years ( $SD = 16.85$ ). Approximately half of those who completed the survey on their mobile (51%). Some socio-demographic characteristics of single

and partnered adults are shown in Table 1. Somewhat more women reported being single compared to men (52.8 vs. 47.2%). Most partnered (42.6%) and single adults (38.2%) had a Bachelor degree or similar. Significantly more single adults reported that they were not religious, compared to partnered adults (66.1 vs. 57.3%). More singles reported living in a city than partnered adults (62.1 vs. 55.0%). When asked about their sexual orientation, the vast majority identified themselves as heterosexual (95.4% of partnered and 87.9% of single adults). More partnered adults (97.3%) reported having had life-time experiences of vaginal, oral, or anal intercourse than single adults (85.6%).

### Measurements

*Sexual satisfaction* was indexed by the following item: “All things considered, how satisfied are you with your sexual life?” with response options ranging from 1 = very dissatisfied to 5 = very satisfied.

*Relationship status* was measured by asking participants about their civil status, with responses being 1 = unmarried, 2 = separated/divorced, 3 = widow/widower, 4 = married/cohabitant/registered partnership. An additional question was provided for those who selected unmarried, separated/divorced, or widow/widower: “Are you currently in a permanent relationship?” The response options were 1 = no, 2 = yes, with one person, 3 = yes, with several persons. A new variable (relationship status) was constructed by coding civil status (responses 1–3) and response 1 to the additional question as 0 = single. If civil status = 4, or if 1–3 but currently in a permanent relationship (2–3), the response was recoded as 1 = partnered.

*Age* was assessed by the individual’s year of birth.

*Education* was indicated by the following question (Træen et al., 2019): “What is your highest level of formal education?” Answers were 1 = primary school (6–8 years), 2 = lower secondary school (9–10 years), 3 = higher secondary

**Table 1.** Socio-demographic characteristics of single and partnered adults in Norway (percent).

	Single (n = 1076)		Partnered (n = 3074)		p
	%	n	%	n	
Gender					<.001
	Men	47.2	507	54.5	1668
	Women	52.8	568	45.5	1395
Age groups					<.001
	> 30 years	31.1	335	17.7	544
	30–44 years	27.8	299	30.1	924
	45–59 years	19.5	210	24.5	752
	60+ years	21.6	232	27.8	854
Level of education					.026
	6–8 years of schooling	0.6	6	0.9	26
	9–10 years of schooling	4.9	53	4.5	139
	12–13 years of schooling	34.0	365	29.1	891
	Lower university level	38.2	410	42.6	1301
	Higher university level	22.3	239	22.9	700
Religious					<.001
	No	66.1	688	57.3	1725
	Christian – no denomination	14.0	146	19.5	587
	Roman Catholic	0.8	8	0.7	22
	Protestant	14.8	154	17.8	537
	Baptist/Methodist/Evangeline	2.9	30	2.8	83
	Islam/Muslim	0.2	2	0.8	25
	Other	1.2	13	1.1	33
Place of residence					<.001
	Urban/city	62.1	665	55.0	1683
	Small town	25.0	268	27.5	843
	Rural	12.9	138	17.5	534
Sexual orientation					<.001
	Heterosexual	87.9	921	95.4	2887
	Homosexual/lesbian	4.3	45	2.0	62
	Bisexual/pansexual	6.5	68	2.1	65
	Asexual/other	1.3	14	0.4	12
Ever intercourse <sup>a</sup>					<.001
	Yes	85.6	893	97.3	2914
	No	14.4	150	2.7	82

Note. <sup>a</sup>Vaginal, oral or anal intercourse; chi-square test of differences for relationship status.

school, high school (12–13 years), 4 = college, lower university level (Bachelor degree or similar), and 5 = higher university level (Master degree, PhD level or similar).

*Self-estimated health* was measured by asking: “Generally speaking, how do you rate your health?” with responses being 1 = very good, 2 = good, 3 = average, 4 = bad, and 5 = very bad.

*Intercourse frequency* was assessed by asking (adapted from Lee et al., 2016): “How many times have you had sexual intercourse (vaginal, anal, or oral sex) during the last month?” and *masturbation frequency* was assessed by a one-item indicator (Lee et al., 2016), namely “How often did you masturbate in the past month?” Both items were assessed on a scale ranging from 1 = no times to 7 = more than once a day.

*Satisfaction with singlehood* was measured among those who reported not being in a current relationship: “All things considered, how satisfied are you with being single/not being in a permanent relationship?” with responses ranging from 1 = not at all satisfied to 7 = completely satisfied.

*Satisfaction with relationship* was measured by a one-item indicator: “All things considered, how satisfied are you with your current relationship?” with responses on a 7-point scale, ranging from 1 = not at all satisfied to 7 = completely satisfied.

*Contentment with sexual frequency* was assessed by a one-item indicator: “In general, how satisfied are you with your current level of sexual activity?” with responses on a 5-point scale, ranging from 1 = very unsatisfied to 5 = very satisfied.

*Body image* was indicated by asking (Frederick et al., 2016): “How dissatisfied or satisfied are you with your physical appearance?” *Genital self-image* was measured by a single item (Kvalem et al., 2014): “How dissatisfied or satisfied are you with the appearance of your genitalia (e.g., penis/labia)?” Both items were recoded so that increasing scores reflected being more dissatisfied (1 = extremely satisfied to 7 = extremely dissatisfied).

*Distressing sexual difficulties* were measured by asking (Mitchell et al., 2013): “In the past year, have you experienced any of the following for a period of 3 months or longer?” Eight items of sexual difficulty were presented: “lacked interest in having sex,” “lacked enjoyment of sex,” “felt

anxious during sex,” “felt no excitement or arousal during sex,” “did not reach climax (experienced an orgasm) or took a long time to reach climax despite feeling excited/aroused,” “reached climax more quickly than I would have liked,” “if woman: had an uncomfortably dry vagina,” and “if man: had trouble getting or keeping an erection.” The response option for each item was “no” or “yes,” and if a participant ticked “yes” they were asked to anchor their level of distress on a scale from 1 = no distress to 4 = severe distress. A composite measure was constructed, where higher scores index greater sexual distress.

*Relationship duration* was indexed by calculating the difference between the year of the survey and the participants response to the item: “In which year were you married/cohabiting/registered partner with your current spouse/partner?” which resulted in a continuous variable.

*Inclusion of other in the self* was indexed by the Inclusion of Other in the Self (IOS) Scale (Aron et al., 1992), which intends to measure how close two people feel to each other. The measure consists of a one-item pictorial measure, which depicts two circles with a varying degree of overlap, with one circle illustrating the self and the other the partner. As the overlap between the two circles expands, so does the interpersonal interconnectedness. Participants were asked to select the image which best describes their relationship. Image 1 depicts two circles that were close to each other, but with no overlap. The degree of overlap between the circles progresses linearly, demonstrating a 7-point scale. Image 7 depicts an almost complete overlap between the two circles.

*Sexual avoidance* was indexed by a one-item indicator (GeSiD, <https://gesid.eu/studie/>), “During the past 12 months, have you deliberately avoided having sex with your partner?” Response options were given on a 5-point scale (1 = never, to 5 = very often).

### **Analytic strategy**

Bivariate analysis was conducted to (1) describe the sociodemographic characteristics of single and partnered adults, (2) present men and women’s level of sexual satisfaction, by relationship

status. Subsequently, multiple hierarchical regression analyses were carried out to investigate the relative importance of sociodemographic, sexual behavioral, evaluative, and relationship factors (the latter only among partnered adults) with regard to sexual satisfaction, separately by gender and relationship status. Before the multivariate model was built independent associations between each potential covariate and the criterion variable (sexual satisfaction) were tested and only those who were statistically significant were further advanced. Consequently, several sociodemographic variables (place of residence, religiosity, and sexual orientation) had to be excluded from the multiple hierarchical regression analyses. The statistical analyses were conducted in IBM SPSS version 28.0.

## Results

Most men and women reported being quite satisfied with their sexual life (35%) (Table 2). When asking singles and partnered adults separately, however, the majority of single women and men said that they were neither satisfied nor dissatisfied with their sexual life (41.2 and 27.8%, respectively), followed by 22.7% women and 25.3% men being somewhat dissatisfied. In contrast, partnered women and men reported most often that they were quite satisfied with their sexual life (40.5 and 38.9%, respectively).

Hierarchical multiple regression analyses were carried out to assess the relative importance of factors in predicting sexual satisfaction among single women, single men, partnered women, and

partnered men. In the first model, we added age, education, and self-estimated general health to control their influence on sexual behavioral, evaluative, and relationship factors. In the second model, we introduced sexual behavioral factors, such as the frequency of intercourse (vaginal, oral, or anal) and masturbation during the past month. The third model contained factors concerning how individuals evaluated different aspects of their life (satisfaction with sexual activity, satisfaction with singlehood/relationship, satisfaction with physical appearance, distressing sexual difficulties). In the partnered samples, a fourth model was introduced, assessing relationship duration, sexual avoidance and relationship closeness.

Table 3 presents predictors and correlates of sex life satisfaction for single women. The factors that were significantly associated with sexual satisfaction among single women were higher contentment with current level of sexual activity ( $\beta = 0.32, p < .001$ ), greater satisfaction with singlehood ( $\beta = 0.24, p = .001$ ), higher masturbation frequency ( $\beta = 0.21, p = .002$ ), higher level of sexual intercourse activity ( $\beta = 0.19, p = .004$ ), and older age ( $\beta = 0.15, p = .028$ ). Poorer self-estimated general health ( $\beta = -0.13, p = .040$ ) and higher levels of distressing sexual difficulties ( $\beta = -0.12, p = .045$ ) were negatively related to sexual satisfaction. All significant relationships were observed in Model 3, which explained 46% of the variability in sexual satisfaction.

Among single men (Table 4), the most powerful factors in predicting sexual satisfaction were contentment with current sexual frequency ( $\beta = 0.41, p < .001$ ), genital self-image ( $\beta = -0.27, p < .001$ ), satisfaction with singlehood ( $\beta = 0.17, p = .002$ ), and higher level of sexual intercourse activity ( $\beta = 0.15, p = .006$ ). All these associations were observed after adjustment (Model 3). Poorer self-estimated health, higher masturbation frequency, and lower education were negatively associated with sexual satisfaction. However, these relationships did not remain significant in the final model. The proportion of the explained variance in the final model was 62%.

Table 5 presents predictors and correlates of sex life satisfaction for women who reported

**Table 2.** Sexual satisfaction in Norwegian men and women, by relationship status (percent).

Sexual satisfaction	All		Single		Partnered		<i>p</i>
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
<b>MEN</b>							
Very dissatisfied	10.0	214	20.2	98	7.1	116	<.001
Somewhat dissatisfied	18.8	400	25.3	123	16.8	276	
Neither satisfied nor dissatisfied	21.9	466	27.8	135	20.2	331	
Quite satisfied	34.7	740	20.4	99	38.9	639	
Very satisfied	14.6	311	6.4	31	17.1	280	
<b>WOMEN</b>							
Very dissatisfied	6.6	121	10.9	54	5.0	67	<.001
Somewhat dissatisfied	15.5	284	22.7	113	12.8	171	
Neither satisfied nor dissatisfied	24.6	452	41.2	205	18.5	247	
Quite satisfied	34.6	634	18.5	92	40.5	541	
Very satisfied	18.7	344	6.6	33	23.1	309	

Note. Chi-square test of differences for relationship status.

**Table 3.** Sexual satisfaction in single women by sociodemographic, sexual behavioral, and evaluative factors.

	Model 1			Model 2			Model 3			<i>r</i>
	<i>b</i>	$\beta$	SE	<i>b</i>	$\beta$	SE	<i>b</i>	$\beta$	SE	
Sociodemographic factors										
Age	0.01	0.23**	0.00	0.02	0.35***	0.00	0.01	0.15*	0.00	0.20**
Education	-0.11	-0.08	0.10	-0.10	-0.08	0.09	0.01	0.01	0.08	-0.01
Self-estimated health	-0.24	-0.22**	0.08	-0.19	-0.17*	0.08	-0.15	-0.13*	0.07	-0.17*
$R^2$		0.08								
$\Delta R^2$		0.08***								
Sexual behavioral factors										
Intercourse frequency				0.35	0.30***	0.08	0.22	0.19**	0.07	0.29***
Masturbation frequency				0.11	0.15*	0.05	0.15	0.21**	0.05	0.16*
$R^2$				0.21						
$\Delta R^2$				0.13***						
Evaluative factors										
Satisfaction with singlehood							0.14	0.24***	0.04	0.45***
Contentment with sexual frequency							0.31	0.32***	0.07	0.58***
Body image							0.01	0.01	0.06	-0.18*
Genital image							-0.05	-0.06	0.05	-0.10
Level of sexual distress							-0.12	-0.12*	0.06	-0.21**
$R^2$								0.46		
$\Delta R^2$								0.25***		

Note. For each model (step of the hierarchical regression) we present the unstandardized coefficient (*b*), the standardized coefficient ( $\beta$ ), the standard Error (SE), the multiple correlations squared ( $R^2$ ), and the multiple correlations squared change ( $\Delta R^2$ ). For the final model bivariate analysis (Pearson's *r*) is shown (*n* = 183).

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Table 4.** Sexual satisfaction in single men by sociodemographic, sexual behavioral, and evaluative factors.

	Model 1			Model 2			Model 3			<i>r</i>
	<i>B</i>	$\beta$	SE	<i>B</i>	$\beta$	SE	<i>B</i>	$\beta$	SE	
Sociodemographic factors										
Age	-0.01	-0.14	0.01	-0.01	-0.11	0.01	0.00	0.02	0.00	-0.20**
Education	-0.18	-0.13	0.10	-0.22	-0.15*	0.10	-0.04	-0.03	0.07	-0.12
Self-estimated health	-0.30	-0.23**	0.10	-0.25	-0.19**	0.09	0.01	0.01	0.07	-0.26***
$R^2$		0.10								
$\Delta R^2$		0.10***								
Sexual behavioral factors										
Intercourse frequency				0.40	0.36***	0.08	0.16	0.15**	0.06	0.39***
Masturbation frequency				-0.17	-0.18**	0.06	-0.03	-0.03	0.05	-0.11
$R^2$				0.25						
$\Delta R^2$				0.15***						
Evaluative factors										
Satisfaction with singlehood							0.12	0.17**	0.04	0.44***
Contentment with sexual frequency							0.47	0.41***	0.07	0.67***
Body image							-0.11	-0.12	0.06	-0.44***
Genital image							-0.24	-0.27***	0.05	-0.54***
Level of sexual distress							-0.07	-0.06	0.06	-0.27***
$R^2$								0.62		
$\Delta R^2$								0.37***		

Note. For each model (step of the hierarchical regression) we present the unstandardized coefficient (*b*), the standardized coefficient ( $\beta$ ), the standard Error (SE), the multiple correlations squared ( $R^2$ ), and the multiple correlations squared change ( $\Delta R^2$ ). For the final model bivariate analysis (Pearson's *r*) is shown (*n* = 181).

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

being currently in a permanent relationship. The relative importance of the factors predicting sexual satisfaction for partnered women after adjustment were contentment with current sexual activity ( $\beta = 0.48$ ,  $p < .001$ ), relationship satisfaction ( $\beta = 0.21$ ,  $p < .001$ ), and higher level of intercourse activity ( $\beta = 0.20$ ,  $p < .001$ ). Also, deliberately avoiding sex with a partner ( $\beta = -0.11$ ,  $p < .001$ ), a negative body image ( $\beta =$

$-0.08$ ,  $p = .008$ ). Distressing sexual difficulties ( $\beta = -0.06$ ,  $p = .034$ ) and education ( $\beta = -0.06$ ,  $p = .026$ ) was weakly associated with sexual satisfaction. Age, self-estimated health, and masturbation frequency did not remain significant in the final model. The model explained 64% of the variability in sexual satisfaction.

Partnered men who reported greater contentment with their sexual activity ( $\beta = 0.57$ ,

**Table 5.** Sexual satisfaction in partnered women by sociodemographic, sexual behavioral, and evaluative factors.

Partnered women	Model 1			Model 2			Model 3			Model 4			<i>r</i>
	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	$\beta$	<i>SE</i>	
<b>Sociodemographic factors</b>													
Age	−0.00	−0.03	0.00	0.01	0.09*	0.00	0.00	0.01	−0.00	0.00	−0.03	0.00	−0.03
Education	−0.07	−0.05	0.06	−0.06	−0.04	0.05	−0.08	−0.06*	0.04	−0.09	−0.06*	0.04	−0.01
Self-estimated health	−0.22	−0.18***	0.06	−0.15	−0.12***	0.05	−0.03	−0.02	0.04	−0.02	−0.01	0.04	−0.17***
<i>R</i> <sup>2</sup>													
$\Delta R^2$													
<b>Sexual behavioral factors</b>													
Intercourse frequency				0.44	0.55***	0.03	0.16	0.20***	0.03	0.16	0.20***	0.03	0.53***
Masturbation frequency				−0.09	−0.11**	0.03	−0.03	−0.03	0.02	−0.04	−0.04	0.02	−0.10*
<i>R</i> <sup>2</sup>													0.32
$\Delta R^2$													0.29***
<b>Evaluative factors</b>													
Satisfaction with relationship							0.20	0.22***	0.03	0.19	0.21***	0.03	0.46***
Contentment with sexual frequency							0.52	0.50***	0.04	0.50	0.48***	0.04	0.73***
Body image							−0.07	−0.08*	0.03	−0.08	−0.08**	0.03	−0.22***
Genital image							−0.02	−0.03	0.02	−0.02	−0.02	0.02	−0.19***
Level of sexual distress							−0.10	−0.09**	0.03	−0.07	−0.06*	0.03	−0.36***
<i>R</i> <sup>2</sup>													0.63
$\Delta R^2$													0.31***
<b>Relationship factors</b>													
Relationship duration										0.00	0.04	0.00	0.00
Sexual avoidance										−0.11	−0.11***	0.03	−0.35***
Inclusion of other in the self										−0.01	−0.02	0.02	0.21***
<i>R</i> <sup>2</sup>													0.64
$\Delta R^2$													0.01**

Note. For each model (step of the hierarchical regression) we present the unstandardized coefficient (*b*), the standardized coefficient ( $\beta$ ), the standard Error (*SE*), the multiple correlations squared (*R*<sup>2</sup>), and the multiple correlations squared change ( $\Delta R^2$ ). For the final model bivariate analysis (Pearson's *r*) is shown (*n* = 542).

\**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.

*p* < .001), more frequent intercourse activity ( $\beta = 0.17$ , *p* < .001), greater relationship satisfaction ( $\beta = 0.15$ , *p* < .001) reported higher levels of sexual satisfaction (Table 6). These associations were observed even after adjustment (Model 4). Relationship duration ( $\beta = -0.12$ , *p* = .004), avoiding sexual activity with one's partner ( $\beta = -0.06$ , *p* = .009), lower satisfaction with their genital appearance, masturbation frequency, and lower general self-estimated health were negatively related to sexual satisfaction, but did not remain significant in the final model. The model explained 69% of the variability in sexual satisfaction.

## Discussion

Previous research has mainly neglected singles' sex life satisfaction (Park et al., 2021; Park & MacDonald, 2022). The aim of this study was therefore to explore factors that may facilitate or hamper sexual satisfaction among single women and men, and to assess whether they differ from those for partnered adults. Although there were gender and relationship-specific differences in the predictors of sexual satisfaction, there were also

some substantial similarities. Contentment with the current level of sexual activity was the most important predictor of sexual satisfaction across relationship status and gender. Intercourse frequency also predicted sexual satisfaction, but the association was less strong when accounting for participants' contentment with their sexual activity. Another important associate of sexual satisfaction in partnered and single adults was the individual's satisfaction with their relationship or singlehood, respectively. In addition to the aforementioned associates, we found some gender and relationship-specific links. Genital image had an influence on single men's sexual satisfaction, while body image was negatively related to sexual satisfaction in partnered women. Masturbation frequency was significantly and positively associated with sexual satisfaction, but only for single women.

The most dominant predictor of sexual satisfaction across sex and relationship status was the participants' contentment with their current level of sexual activity. This is consistent with previous conceptualizations that suggest strong correlations between satisfaction with sexual activity and overall sexual satisfaction (Štulhofer et al., 2019).



**Table 6.** Sexual satisfaction in partnered men by sociodemographic, sexual behavioral, and evaluative factors.

Partnered men	Model 1			Model 2			Model 3			Model 4			<i>r</i>
	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	$\beta$	<i>SE</i>	<i>B</i>	<i>B</i>	<i>SE</i>	
<b>Sociodemographic factors</b>													
Age	-0.01	-0.07	0.00	0.00	0.04	0.00	-0.00	-0.03	0.00	0.01	0.07	0.00	-0.11***
Education	-0.04	-0.03	0.06	-0.06	-0.04	0.04	-0.05	-0.04	0.03	-0.05	-0.03	0.03	0.02
Self-estimated health	-0.29	-0.21***	0.06	-0.18	-0.13***	0.05	-0.01	-0.01	0.04	-0.01	-0.01	0.04	-0.22***
<i>R</i> <sup>2</sup>		0.05											
$\Delta R^2$		0.05***											
<b>Sexual behavioral factors</b>													
Intercourse frequency				0.50	0.60***	0.03	0.15	0.19***	0.03	0.14	0.17***	0.03	0.59***
Masturbation frequency				-0.12	-0.16***	0.03	-0.02	-0.03	0.02	-0.02	-0.03	0.02	-0.11**
<i>R</i> <sup>2</sup>					0.39								
$\Delta R^2$					0.34***								
<b>Evaluative factors</b>													
Satisfaction with relationship							0.15	0.16***	0.03	0.14	0.15***	0.03	0.49***
Contentment with sexual frequency							0.64	0.58***	0.04	0.63	0.57***	0.04	0.79***
Body image							-0.06	-0.05	0.03	-0.06	-0.05	0.03	-0.22***
Genital image							-0.05	-0.05*	0.03	-0.05	-0.05	0.02	-0.27***
Level of sexual distress							-0.02	-0.02	0.03	-0.01	-0.01	0.03	-0.24***
<i>R</i> <sup>2</sup>								0.69					
$\Delta R^2$								0.29***					
<b>Relationship factors</b>													
Relationship duration										-0.01	-0.12**	0.00	-0.19***
Sexual avoidance										-0.07	-0.06**	0.03	-0.30***
Inclusion of other in the self										0.01	0.01	0.02	0.36***
<i>R</i> <sup>2</sup>											0.69		
$\Delta R^2$											0.01**		

Note. For each model (step of the hierarchical regression) we present the unstandardized coefficient (*b*), the standardized coefficient ( $\beta$ ), the standard Error (*SE*), the multiple correlations squared (*R*<sup>2</sup>), and the multiple correlations squared change ( $\Delta R^2$ ). For the final model bivariate analysis (Pearson's *r*) is shown (*n* = 618).

\**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.

Although previous scales have used contentment with sexual frequency as a direct indicator of global sexual satisfaction (e.g., the Pinney Sexual Satisfaction Inventory [PSSI], Pinney et al., 1987; the Young Sexual Satisfaction Scale [YSSS], Young et al., 1998), it has been argued that satisfaction with sexual frequency might represent a distinct concept (Shaw & Rogge, 2016). For instance, one could be less satisfied with the sexual frequency, but very pleased with the sexual quality (e.g., pleasurable, intensity) (Gillespie, 2017). To prevent conceptual ambiguity and to disentangle the relative strength of various associates on sexual satisfaction, intercourse frequency and contentment with sexual activity were therefore studied as independent predictors of sexual satisfaction. Overall, contentment with sexual activity was a stronger predictor for partnered men than for single men, and it was a stronger predictor for partnered women than for single women. One possible explanation may be that partnered individuals use divergent benchmarks when they evaluate their global sex life satisfaction, compared to single individuals. Partnered adults may to a larger degree anticipate frequent sexual activity, as this is considered to be an

important marker of a happy relationship. Thus, contentment with sexual activity as a criterion of general sex life satisfaction could be weighted more strongly by partnered than by single individuals.

As expected, and in line with previous studies (Brody & Costa, 2009; McNulty et al., 2016; Schoenfeld et al., 2017), there was a strong relationship between intercourse frequency and sexual satisfaction. However, when accounting for other satisfaction domains, specifically satisfaction with sexual activity, body image, genital image, and sexual function, the influence of actual intercourse frequency on sexual satisfaction became less substantial across relationship status and gender. These findings suggest that individuals' satisfaction with sexual frequency is more important in predicting overall sexual satisfaction than actual intercourse frequency.

In contrast to partnered sex, we found less consistent associations between solo sex and sexual satisfaction. Although it is a common finding that single adults masturbate more than partnered adults (DeLamater & Moorman, 2007; Fischer et al., 2022; Regnerus et al., 2017; Rowland et al., 2020; Schick et al., 2010), very little is known

about the relationship between masturbation frequency and sexual satisfaction among single people. A recent study that investigated single and partnered individuals' sexual satisfaction found no significant link between the actual frequency of solitary acts (e.g., masturbation) and sexual satisfaction among single individuals (Park & MacDonald, 2022). In contrast to this study, we found a positive association between single women's masturbation frequency and sexual satisfaction, which may indicate that single women experience more empowerment, freedom, independence in terms of their solo sexual exploration. This finding may be culturally specific, as Norway among other Nordic countries is known for being more liberal and accepting toward women's sexuality (Træen et al., 2019).

Another main predictor of sexual satisfaction was individual's evaluation of their current status (i.e., singlehood and relationship). As expected and consistent with past research (Byers & Rehman, 2014; Freihart et al., 2020; Rausch & Rettenberger, 2021), greater relationship satisfaction was significantly predictive of sexual satisfaction among partnered women and men. Similarly, satisfaction with singlehood was significantly associated with sexual satisfaction: the higher the reported satisfaction of being single, the greater the sexual satisfaction among single men and women. This finding is similar to that of Park et al. (2021), who found significant associations between singles' sexual satisfaction and satisfaction with singlehood, even after controlling for sex frequency and life satisfaction. Likewise, another study that differentiated between voluntary and involuntary singlehood found that being more voluntarily single (degree of not preferring a partnership) was related to higher levels of sexual satisfaction (Kislev, 2021). They also found that voluntary singles showed nearly comparable levels of sex life satisfaction relative to that of partnered women and men. Thus, our findings add to an emerging body of research that emphasizes singles' evaluation of their singlehood as an important correlate of sexual satisfaction.

Men's genital self-image was significantly associated with sexual satisfaction. This corroborates other studies that found important pathways

between men's genital self-image/attitudes toward genitals and sexual (dis)satisfaction (Komarnicky et al., 2019; Van den Brink et al., 2018). For instance, a recent study identified a direct significant association between men's negative attitudes toward their genitals and their sexual dissatisfaction, which was also mediated by body self-consciousness during physical intimacy (Van den Brink et al., 2018). The suggested mechanism behind these associations is that low genital self-image increases sexual self-awareness and distraction during partnered sex, which in turn negatively interferes with individual's sexual satisfaction (Schick et al., 2010; Van den Brink et al., 2018). This mechanism might also explain why the association between genital self-image and sexual satisfaction was strongest among single men. With new and changing sex partners, single men may feel more vulnerable and exposed to the risk of being judged.

Finally, we found some links between relationship factors and sexual satisfaction, such as negative association between relationship duration and sexual satisfaction in partnered men. Deliberately avoiding sex with a partner was negatively associated with sexual satisfaction among both partnered women and men. This finding is supported by another study (Stephenson, 2020). Moreover, recent research suggests important links between distressing sexual difficulties and sexual avoidance (Carvalho et al., 2020; Fischer & Træen, 2022; Hendrickx et al., 2016). As sexual avoidance is indirectly related to many negative feelings (e.g., guilt, blame, anger, emotional distress, rejection, frustration, anxiety, sadness, and sexual incompetence; Fischer & Træen, 2022; Frost & Donovan, 2021), it is no surprise that the deliberate avoidance of sex with a partner is negatively intertwined with sexual satisfaction.

### **Limitations**

An important caveat of this study is the survey's cross-sectional nature, which precludes any causal conclusions. It is also important to point out some measurement limitations. First, our outcome measure (general sexual satisfaction) was assessed by a one-item measure. Although multi-item sexual satisfaction scales are more favorable, the use of a

single measure is a common approach that has shown to have satisfactory convergent validity (Mark et al., 2014). Second, the item measuring masturbation frequency did not explicitly elaborate whether we were asking about solo masturbation. As masturbation could also refer to masturbating another person or masturbating oneself in the presence of another person, we cannot be sure how participants may have interpreted the item (Fischer & Træen, 2022). Likewise, the item measuring contentment with the current level of sexual activity lacked an explanation of the term “sexual activity” (Fischer et al., 2022). Another limitation pertains potentially relevant factors that have not been assessed in the survey. For example, future research would benefit in assessing the role of individuals’ sexual self-esteem and sociosexuality and should allow for comparisons across more nuanced relationship types (e.g., currently dating, looking for a partner vs. single by choice, cohabiting vs. non-cohabitating). Lastly, in keeping with a general trend of declining response rates (Galea & Tracy, 2007), the survey’s response rate was rather low. Thus, potential volunteer may distort our findings and limit their generalizability (Boughner, 2010).

## Conclusions

Previous evidence for partnered individuals’ sexual satisfaction might not be directly transferable to that for single adults (Park & MacDonald, 2022). This study found important nuances in the predictors/correlates of sexual satisfaction in singlehood, such as the influence of frequent masturbation in single women, and a positive genital self-image in single men. The current study adds to an emerging body of research that emphasizes singles’ evaluation of their singlehood as an influential determinant of sexual satisfaction. Accordingly, this study provides preliminary evidence that single adults’ evaluation of their relationship status (satisfaction with singlehood) is equivalent to partnered adults’ evaluation of their relationship status (relationship satisfaction).

## Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

## Funding

This work was supported by the University of Oslo.

## References

- Antičević, V., Jokić-Begić, N., & Britvić, D. (2017). Sexual self-concept, sexual satisfaction, and attachment among single and coupled individuals. *Personal Relationships*, 24(4), 858–868. <https://doi.org/10.1111/per.12217>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63(4), 596–612. <https://doi.org/10.1037/0022-3514.63.4.596>
- Bancroft, J., Long, J. S., & McCabe, J. (2011). Sexual well-being: A comparison of U.S. black and white women in heterosexual relationships. *Archives of Sexual Behavior*, 40(4), 725–740. <https://doi.org/10.1007/s10508-010-9679-z>
- Berrefjord Bergløff, C., Holvik, M., & da Silca Sæther, P. (2021, November 6). *Slik kartla vi “Det nye Singel-Norge”*. [https://www.nrk.no/livsstil/slik-kartla-vi-\\_det-nye-singel-norge\\_-1.15714921](https://www.nrk.no/livsstil/slik-kartla-vi-_det-nye-singel-norge_-1.15714921)
- Boughner, R. L. (2010). Volunteer bias. In N. J. Salkind (Ed.), *Encyclopedia of research design*. SAGE Publications.
- Brody, S., & Costa, R. M. (2009). Satisfaction (sexual, life, relationship, and mental health) is associated directly with penile–vaginal intercourse, but inversely with other sexual behavior frequencies. *The Journal of Sexual Medicine*, 6(7), 1947–1954. <https://doi.org/10.1111/j.1743-6109.2009.01303.x>
- Buczak-Stec, E., König, H. H., & Hajek, A. (2021). Sexual satisfaction of middle-aged and older adults: Longitudinal findings from a nationally representative sample. *Age and Ageing*, 50(2), 559–564. <https://doi.org/10.1093/ageing/afaa161>
- Byers, E. S., & Rehman, U. S. (2014). Sexual well-being. In D. L. Tolman, L. M. Diamond, J. A. Bauermeister, W. H. George, J. G. Pfaus, & L. M. Ward (Eds.), *APA handbook of sexuality and psychology, Vol. 1. Person-based approaches* (pp. 317–337). American Psychological Association.
- Carvalho, A., Graham, C., Stulhofer, A., & Traen, B. (2020). Predictors and correlates of sexual avoidance among partnered older adults in Norway, Denmark, Belgium, and Portugal. *European Journal of Ageing*, 17(2), 175–184. <https://doi.org/10.1007/s10433-019-00540-y>
- Coleman, E. (2003). Masturbation as a means of achieving sexual health. *Journal of Psychology & Human Sexuality*, 14(2–3), 5–16. [https://doi.org/10.1300/J056v14n02\\_02](https://doi.org/10.1300/J056v14n02_02)
- Cranney, S. (2017). Sex life satisfaction in Sub-Saharan Africa: A descriptive and exploratory analysis. *Archives of Sexual Behavior*, 46(7), 1961–1972. <https://doi.org/10.1007/s10508-017-0984-7>
- Dekker, A., Matthiesen, S., Cerwenka, S., Otten, M., & Briken, P. (2020). Health, sexual activity, and sexual

- satisfaction. *Deutsches Arzteblatt International*, 117(39), 645–652. <https://doi.org/10.3238/arztebl.2020.0645>
- DeLamater, J., & Moorman, S. M. (2007). Sexual behavior in later life. *Journal of Aging and Health*, 19(6), 921–945. <https://doi.org/10.1177/0898264307308342>
- DePaulo, B. M., & Morris, W. L. (2005). Singles in society and in science. *Psychological Inquiry*, 16(2), 57–83. [https://doi.org/10.1207/s15327965pli162&3\\_01](https://doi.org/10.1207/s15327965pli162&3_01)
- DePaulo, B. M., & Morris, W. L. (2006). The unrecognized stereotyping and discrimination against singles. *Current Directions in Psychological Science*, 15(5), 251–254. <https://doi.org/10.1111/j.1467-8721.2006.00446.x>
- Field, N., Mercer, C. H., Sonnenberg, P., Tanton, C., Clifton, S., Mitchell, K. R., Erens, B., MacDowall, W., Wu, F., Datta, J., Jones, K. G., Stevens, A., Prah, P., Copas, A. J., Phelps, A., Wellings, K., & Johnson, A. M. (2013). Associations between health and sexual lifestyles in Britain: Findings from the third National Survey of Sexual Attitudes and Lifestyles (natsal-3). *Lancet*, 382(9907), 1830–1844. [https://doi.org/10.1016/S0140-6736\(13\)62222-9](https://doi.org/10.1016/S0140-6736(13)62222-9)
- Fischer, N., Graham, C. A., Træen, B., & Hald, G. M. (2022). Prevalence of masturbation and associated factors among older adults in four European countries. *Archives of Sexual Behavior*, 51(3), 1385–1396. <https://doi.org/10.1007/s10508-021-02071-z>
- Fischer, N., Štulhofer, A., Hald, G. M., Carvalheira, A., & Træen, B. (2021). Sexual satisfaction in older heterosexual couples from four European countries: Exploring the roles of actual and perceived discrepancy in sexual interest. *Journal of Sex Research*, 58(1), 64–73. <https://doi.org/10.1037/14193-011>
- Fischer, N., & Træen, B. (2022). A seemingly paradoxical relationship between masturbation frequency and sexual satisfaction. *Archives of Sexual Behavior*, 51(6), 3151–3167. <https://doi.org/10.1007/s10508-022-02305-8>
- Fischer, N., & Træen, B. (2022). Prevalence of sexual difficulties and related distress and their association with sexual avoidance in Norway. *International Journal of Sexual Health*, 34(1), 27–40. <https://doi.org/10.1080/19317611.2021.1926040>
- Fischer, N., Træen, B., Štulhofer, A., & Hald, G. M. (2020). Mechanisms underlying the association between perceived discrepancy in sexual interest and sexual satisfaction among partnered older adults in four European countries. *European Journal of Ageing*, 17(2), 151–162. <https://doi.org/10.1007/s10433-019-00541-x>
- Frederick, D. A., Lever, J., Gillespie, B. J., & Garcia, J. R. (2017). What keeps passion alive? Sexual satisfaction is associated with sexual communication, mood setting, sexual variety, oral sex, orgasm, and sex frequency in a National U.S. Study. *Journal of Sex Research*, 54(2), 186–201. <https://doi.org/10.1080/00224499.2015.1137854>
- Frederick, D. A., Sandhu, G., Morse, P. J., & Swami, V. (2016). Correlates of appearance and weight satisfaction in a U.S. national sample: Personality, attachment style, television viewing, self-esteem, and life satisfaction. *Body Image*, 17, 191–203. <https://doi.org/10.1016/j.bodyim.2016.04.001>
- Freihart, B. K., Sears, M. A., & Meston, C. M. (2020). Relational and interpersonal predictors of sexual satisfaction. *Current Sexual Health Reports*, 12(3), 136–142. <https://doi.org/10.1007/s11930-020-00260-w>
- Frost, R., & Donovan, C. (2021). A qualitative exploration of the distress experienced by long-term heterosexual couples when women have low sexual desire. *Sexual and Relationship Therapy*, 36(1), 22–45. <https://doi.org/10.1080/14681994.2018.1549360>
- Frost, D. M., McClelland, S. I., & Dettmann, M. (2017). Sexual closeness discrepancies: What they are and why they matter for sexual well-being in romantic relationships. *Archives of Sexual Behavior*, 46(8), 2353–2364. <https://doi.org/10.1007/s10508-017-0960-2>
- Furman, W., & Shaffer, L. (2011). Romantic partners, friends, friends with benefits, and casual acquaintances as sexual partners. *Journal of Sex Research*, 48(6), 554–564. <https://doi.org/10.1080/00224499.2010.535623>
- Galea, S., & Tracy, M. (2007). Participation rates in epidemiologic studies. *Annals of Epidemiology*, 17(9), 643–653. <https://doi.org/10.1016/j.annepidem.2007.03.013>
- Gillespie, B. J. (2017). Sexual synchronicity and communication among partnered older adults. *Journal of Sex & Marital Therapy*, 43(5), 441–455. <https://doi.org/10.1080/0092623X.2016.1182826>
- Haus, K. R., & Thompson, A. E. (2020). An examination of the sexual double standard pertaining to masturbation and the impact of assumed motives. *Sexuality & Culture*, 24(3), 809–834. <https://doi.org/10.1007/s12119-019-09666-8>
- Hendrickx, L., Gijs, L., & Enzlin, P. (2016). Sexual difficulties and associated sexual distress in Flanders (Belgium): A representative population-based survey study. *The Journal of Sexual Medicine*, 13(4), 650–668. <https://doi.org/10.1016/j.jsxm.2016.01.014>
- Kislev, E. (2020). Does marriage really improve sexual satisfaction? Evidence from the pairfam dataset. *Journal of Sex Research*, 57(4), 470–481. <https://doi.org/10.1080/00224499.2019.1608146>
- Kislev, E. (2021). The sexual activity and sexual satisfaction of singles in the second demographic transition. *Sexuality Research and Social Policy*, 18(3), 726–738. <https://doi.org/10.1007/s13178-020-00496-0>
- Komarnicky, T., Skakoon-Sparling, S., Milhausen, R. R., & Breuer, R. (2019). Genital self-image: Associations with other domains of body image and sexual response. *Journal of Sex & Marital Therapy*, 45(6), 524–537. <https://doi.org/10.1080/0092623X.2019.1586018>
- Kvalem, I. L., Træen, B., Lewin, B., & Štulhofer, A. (2014). Self-perceived effects of internet pornography use, genital appearance satisfaction, and sexual self-esteem among young Scandinavian adults. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 8(4), Article 4. <https://doi.org/10.5817/CP2014-4-4>

- Lawrance, K., & Byers, E. S. (1995). Sexual satisfaction in long-term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships*, 2(4), 267–285. <https://doi.org/10.1111/j.1475-6811.1995.tb00092.x>
- Lee, D. M., Nazroo, J., O'Connor, D. B., Blake, M., & Pendleton, N. (2016). Sexual health and well-being among older men and women in England: Findings from the English Longitudinal Study of Ageing. *Archives of Sexual Behavior*, 45(1), 133–144. <https://doi.org/10.1007/s10508-014-0465-1>
- Madanikia, Y., Bartholomew, K., & Cytrynbaum, J. B. (2013). Depiction of masturbation in North American movies. *The Canadian Journal of Human Sexuality*, 22(2), 106–115. <https://doi.org/10.3138/cjhs.2013.2052>
- Mark, K. P., Herbenick, D., Fortenberry, J. D., Sanders, S., & Reece, M. (2014). A psychometric comparison of three scales and a single-item measure to assess sexual satisfaction. *Journal of Sex Research*, 51(2), 159–169. <https://doi.org/10.1080/00224499.2013.816261>
- McNulty, J. K., Wenner, C. A., & Fisher, T. D. (2016). Longitudinal associations among relationship satisfaction, sexual satisfaction, and frequency of sex in early marriage. *Archives of Sexual Behavior*, 45(1), 85–97. <https://doi.org/10.1007/s10508-014-0444-6>
- Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., Copas, A. J., Tanton, C., Erens, B., Sonnenberg, P., Clifton, S., Macdowall, W., Phelps, A., Johnson, A. M., & Wellings, K. (2013). Sexual function in Britain: Findings from the third national survey of sexual attitudes and lifestyles (Natsal-3). *Lancet (London, England)*, 382(9907), 1817–1829. [https://doi.org/10.1016/S0140-6736\(13\)62366-1](https://doi.org/10.1016/S0140-6736(13)62366-1)
- Neto, F. (2012). The satisfaction with sex life scale. *Measurement and Evaluation in Counseling and Development*, 45(1), 18–31. <https://doi.org/10.1177/0748175611422898>
- Neto, F., & Pinto, M. (2013). The satisfaction with sex life across the adult life span. *Social Indicators Research*, 114(3), 767–784. <https://doi.org/10.1007/s11205-012-0181-y>
- Neto, F., & Pinto, M. (2015). A cross-cultural investigation of satisfaction with sex life among emerging adults. *Social Indicators Research*, 120(2), 545–557. <http://www.jstor.org/stable/24721128> <https://doi.org/10.1007/s11205-014-0604-z>
- Oh, J., Chopik, W. J., & Lucas, R. E. (2022). Happiness singled out: Bidirectional associations between singlehood and life satisfaction. *Personality & Social Psychology Bulletin*, 48(11), 1597–1613. <https://doi.org/10.1177/01461672211049049>
- Park, Y., Impett, E. A., & MacDonald, G. (2021). Singles' sexual satisfaction is associated with more satisfaction with singlehood and less interest in marriage. *Personality & Social Psychology Bulletin*, 47(5), 741–752. <https://doi.org/10.1177/014616722094236>
- Park, Y., & MacDonald, G. (2022). Single and partnered individuals' sexual satisfaction as a function of sexual desire and activities: Results using a sexual satisfaction scale demonstrating measurement invariance across partnership status. *Archives of Sexual Behavior*, 51(1), 547–564. <https://doi.org/10.1007/s10508-021-02153-y>
- Pascoal, P. M., Narciso, I. D. S. B., & Pereira, N. (2014). What is sexual satisfaction? Thematic analysis of lay people's definitions. *Journal of Sex Research*, 51(1), 22–30. <https://doi.org/10.1080/00224499.2013.815149>
- Pepping, C. A., MacDonald, G., & Davis, P. J. (2018). Toward a psychology of singlehood: An attachment-theory perspective on long-term singlehood. *Current Directions in Psychological Science*, 27(5), 324–331. <https://doi.org/10.1177/0963721417752106>
- Pietras, L., Wiessner, C., & Briken, P. (2022). How inclusion of other in the self relates to couple's sexuality and functioning – results from the German Health and Sexuality Survey (GeSiD). *The Journal of Sex Research*, 59(4), 493–503. <https://doi.org/10.1080/00224499.2021.1998307>
- Pinney, E. M., Gerrard, M., & Denney, N. W. (1987). The Pinney Sexual Satisfaction Inventory. *Journal of Sex Research*, 23(2), 233–251. <http://www.jstor.org/stable/3812593> <https://doi.org/10.1080/00224498709551359>
- Rausch, D., & Rettenberger, M. (2021). Predictors of sexual satisfaction in women: A systematic review. *Sexual Medicine Reviews*, 9(3), 365–380. <https://doi.org/10.1007/s10508-019-1397-6>
- Regnerus, M., Price, J., & Gordon, D. (2017). Masturbation and partnered sex: Substitutes or complements? *Archives of Sexual Behavior*, 46(7), 2111–2121. <https://doi.org/10.1007/s10508-017-0975-8>
- Rowland, D. L., Kolba, T. N., McNabney, S. M., Uribe, D., & Hevesi, K. (2020). Why and how women masturbate, and the relationship to orgasmic response. *Journal of Sex & Marital Therapy*, 46(4), 361–376. <https://doi.org/10.1080/0092623X.2020.1717700>
- Schick, V. R., Calabrese, S. K., Rima, B. N., & Zucker, A. N. (2010). Genital appearance dissatisfaction: Implications for women's genital image self-consciousness, sexual esteem, sexual satisfaction, and sexual risk. *Psychology of Women Quarterly*, 34(3), 394–404. <https://doi.org/10.1111/j.1471-6402.2010.01584.x>
- Schick, V., Herbenick, D., Reece, M., Sanders, S. A., Dodge, B., Middlestadt, S. E., & Fortenberry, J. D. (2010). Sexual behaviors, condom use, and sexual health of Americans over 50: Implications for sexual health promotion for older adults. *The Journal of Sexual Medicine*, 7(1), 315–329. <https://doi.org/10.1111/j.1743-6109.2010.02013.x>
- Schmiedeborg, C., & Schröder, J. (2016). Does sexual satisfaction change with relationship duration? *Archives of Sexual Behavior*, 45(1), 99–107. <https://doi.org/10.1007/s10508-015-0587-0>
- Schoenfeld, E. A., Loving, T. J., Pope, M. T., Huston, T. L., & Stulhofer, A. (2017). Does sex really matter? Examining the connections between spouses' nonsexual behaviors, sexual frequency, sexual satisfaction, and

- marital satisfaction. *Archives of Sexual Behavior*, 46(2), 489–501. <https://doi.org/10.1007/s10508-015-0672-4>
- Shaw, A. M., & Rogge, R. D. (2016). Evaluating and refining the construct of sexual quality with item response theory: Development of the Quality of Sex Inventory. *Archives of Sexual Behavior*, 45(2), 249–270. <https://doi.org/10.1007/s10508-015-0587-0>
- Stephenson, K. R. (2020). Exploring the role of sexual avoidance in male sexual dysfunction. *Journal of Sex Research*, 57(4), 522–533. <https://doi.org/10.1080/00224499.2019.1663480>
- Štulhofer, A., Jurin, T., Graham, C., Enzlin, P., & Træen, B. (2019). Sexual wellbeing in older men and women: Construction and validation of a multi-dimensional measure of four European countries. *Journal of Happiness Studies*, 20(7), 2329–2350. <https://doi.org/10.1007/s10902-018-0049-1>
- Træen, B., Fischer, N., & Kvalem, I. L. (2022). Sexual variety in Norwegian men and women of different sexual orientations and ages. *Journal of Sex Research*, 59(2), 238–247. <https://doi.org/10.1080/00224499.2021.1952156>
- Træen, B., & Kvalem, I. L. (2022). Satisfaction with singlehood and sexual activity. *Sexuality & Culture*, 26(5), 1621–1638. <https://doi.org/10.1007/s12119-022-09961-x>
- Træen, B., & Lewin, B. (2008). *Sexology in context*. Universitetsforlaget AS.
- Træen, B., Štulhofer, A., Janssen, E., Carvalheira, A. A., Hald, G. M., Lange, T., & Graham, C. (2019). Sexual activity and sexual satisfaction among older adults in four European countries. *Archives of Sexual Behavior*, 48(3), 815–829. <https://doi.org/10.1007/s10508-018-1256-x>
- Træen, B., Fischer, N., & Kvalem, I. L. (2021). Sexual intercourse activity and activities associated with sexual interaction in Norwegians of different sexual orientations and ages. *Sexual and Relationship Therapy*, 1–17. <https://doi.org/10.1080/14681994.2021.1912316>
- Van den Brink, F., Vollmann, M., Sternheim, L. C., Berkhout, L. J., Zomerdijk, R. A., & Woertman, L. (2018). Negative body attitudes and sexual dissatisfaction in men: The mediating role of body self-consciousness during physical intimacy. *Archives of Sexual Behavior*, 47(3), 693–701. <https://doi.org/10.1007/s10508-017-1016-3>
- Velten, J., & Margraf, J. (2017). Satisfaction guaranteed? How individual, partner, and relationship factors impact sexual satisfaction within partnerships. *PLoS One*, 12(2), e0172855. <https://doi.org/10.1371/journal.pone.0172855>
- Vowels, L. M., & Mark, K. P. (2020). Relationship and sexual satisfaction: A longitudinal actor–partner interdependence model approach. *Sexual and Relationship Therapy*, 35(1), 46–59. <https://doi.org/10.1080/14681994.2018.1441991>
- Watson, A. F., & McKee, A. (2013). Masturbation and the media. *Sexuality & Culture*, 17(3), 449–475. <https://doi.org/10.1007/s12119-013-9186-1>
- Young, M., Denny, G., Luquis, R., & Young, T. (1998). Correlates of sexual satisfaction in marriage. *Canadian Journal of Human Sexuality*, 7, 115–127.