

# Singles' Sexual Satisfaction is Associated With More Satisfaction With Singlehood and Less Interest in Marriage

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## Abstract

Despite the worldwide increase in single-person households, little research has examined what factors contribute to a satisfying single life. We used three data sets ( $N = 3,890$ ) to examine how satisfaction with sexual and social aspects of life are linked with single people's perceptions of marriage and singlehood. Our results suggest that higher sexual satisfaction is associated with less desire to marry (Study 1), stronger beliefs that unmarried people can be happy without marriage (Study 2), and greater satisfaction with singlehood and less desire for a partner (Study 3). All effects in Studies 1 and 3 remained significant controlling for life satisfaction and sexual frequency. Satisfying friendships were associated with variables related to satisfaction with singlehood but not variables related to desire for a partner, whereas no effect was found for satisfaction with family. This study highlights the potential importance of maintaining a satisfying sex life in people's satisfaction with singlehood.

## Keywords

singlehood, relationship status, sexuality, intimacy

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As reflected in declining rates of marriage (Organisation for Economic Co-operation and Development [OECD], 2019) and an increasing share of single-person households (average of 31% in 32 OECD countries in 2011; OECD, 2016), a large proportion of the population today lives without a romantic partner. Along with this growth in the single (unpartnered) population, there has been an increasing recognition that singles are heterogeneous and cannot be categorized as a monolithic group (Pepping & MacDonald, 2019). In particular, because satisfaction with relationship status (i.e., with one's partnership or singlehood) is a more important determinant of well-being than relationship status per se (Adamczyk, 2019; Lehmann et al., 2015), moving away from the traditional approach of contrasting singles with partnered individuals (Diener et al., 2000) to studying within-group variation in singles' satisfaction with singlehood can help to better understand single individuals' well-being. However, in contrast to the substantial research on what makes partnered individuals satisfied with their relationships (e.g., Falconier et al., 2015), very little research has been devoted to investigating factors contributing to single individuals' satisfaction with singlehood.

One potential contributor to a satisfying single life suggested in the literature involves single people's close relationships (Simpson, 2016). People have a fundamental desire for intimacy and connection (Hofer & Hagemeyer, 2018),

and romantic relationships are one of the primary sources of intimate experiences for many people (Furman & Buhrmester, 2009). As such, in the absence of a romantic partner, single people are often concerned about feeling lonely or disconnected (Forsyth & Johnson, 1995), and this potential lack of companionship is a common reason people fear being single (Spielmann et al., 2013). It is conceivable, then, that single people may be satisfied with being single to the extent that they have other social ties offering intimate connections. Indeed, although no research has directly examined feelings or thoughts about singlehood as an outcome, studies have shown that single people with higher-quality social networks fare better as indicated by lower levels of loneliness (Dykstra, 1995), higher life satisfaction (Cockrum & White, 1985), and better mental health (Stokes & Moorman, 2017). In a recent study (Kislev, 2020b), it was also found that an increase in social satisfaction in 1 year was associated with a decrease in desire for a partner, a potential correlate with satisfying singlehood, the following year.

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**Table 1.** Overview of the Studies.

Studies	Independent variables	Outcome variables
Study 1	Sexual satisfaction Satisfaction with family Satisfaction with friends	Desire to get married
Study 2	Sexual satisfaction Quality of family relationships Quality of friendships	Belief that happiness can be achieved without marriage Staying unmarried (for the next 10 years)
Study 3 <sup>a</sup>	Sexual satisfaction Satisfaction with family Satisfaction with friends	Satisfaction with singlehood Desire for a partner Likelihood of being single at time of data collection in each of 9 years

<sup>a</sup>We note that our Study 3 was based on the same national data set (pairfam) that Kislev (2020b) used although there were differences in the specific sample, primary questions of interest, and analytic models between the two studies.

**Table 2.** Summary of Sample Characteristics Across Studies.

Variables	Study 1 ( <i>n</i> = 1,406)	Study 2 ( <i>n</i> = 1,202)	Study 3 ( <i>n</i> = 1,282)
Gender	36% men	42% men	59% men
Age	<i>M</i> = 45.65 ( <i>SD</i> = 14.61)	<i>M</i> = 44.20 ( <i>SD</i> = 12.59)	<i>M</i> = 29.63 ( <i>SD</i> = 4.95)
Ethnicity/race	69% White	84% White	79% German native
Education	80% high school graduate or higher	91% high school graduate or higher	<i>M</i> = 12.78 years ( <i>SD</i> = 2.56)
Household income	<i>M</i> = \$28,499 ( <i>SD</i> = \$40,137)	<i>M</i> = \$40,186 ( <i>SD</i> = \$38,596)	<i>M</i> = €2,365 ( <i>SD</i> = €1,704)
Marital history	43% never married	47% never married	88% never married

Another theme that cuts across people's narratives about fear of being single (Spielmann et al., 2013) and their desire to stay in a relationship (Joel et al., 2018) is fulfillment of sexual needs. However, to our knowledge, no research has investigated the contribution of singles' satisfaction with their sex lives to their well-being or satisfaction with singlehood. The absence of a romantic relationship could make it harder for single people to maintain a satisfying sex life given that sexual activities normatively take place within romantic relationships (Conley et al., 2013; Willetts et al., 2004). However, being single does not necessarily mean that people are sexually disinterested or inactive (Addis et al., 2006; McFarland et al., 2011). Single people have multiple potential sexual options including having sex with casual acquaintances, friends with benefits, sex workers (Furman & Shaffer, 2011; Lowman & Atchison, 2006), or engaging in cybersex (Franc et al., 2018). In fact, sexual gratification does not require paired sexual activities and can be maintained by engaging in solitary activities such as consuming sexual media, fantasizing, or masturbating (Goldey et al., 2016; Regnerus et al., 2017). Thus, although single people show lower average levels of sexual satisfaction than partnered individuals (Antičević et al., 2017; Kislev, 2020a), there will likely be important within-group variability.

In this research, we used three large data sets to examine how having a satisfactory social and/or sex life is associated with the

draw toward marriage and singlehood. Across studies, single people are operationalized as those who are currently unmarried and are not involved in a serious relationship (the specific selection criteria are detailed in each study). As summarized in Table 1, in Studies 1 and 2, we assessed how much single people want marriage and believe that marriage is required for happiness which may indirectly speak to their desire for a partner and feelings about their current relationship status (singlehood). In Study 3, we used direct measures of people's satisfaction with singlehood and desire for a partner. Full descriptions of measures are available as Supplemental Material. Sample characteristics in each study are summarized in Table 2.

It should be noted that our variables related to relationships with family and friends are not referring to one particular relationship (in contrast to cases such as evaluation of satisfaction with a specific romantic partner). Rather, they capture a broad evaluation of how satisfying one's relationships with family and friends are, with the specific type or number of family members and friends in consideration likely varying across participants. Similarly, our sexual satisfaction variable also captures an overall judgment of one's sexual life, and factors that contribute to this judgment (e.g., casual sex, solo sexual activity) and weights on each factor will vary across participants. Research on singles' sexual satisfaction is surprisingly rare, and one problem with conducting such research is that the researcher cannot target questions to one specific sexual

partner (or even assume that there are any partners) as has been done in previous research centered on sexual satisfaction among those in relationships (Mark et al., 2014). Although establishing a standard definition for sexual satisfaction among singles is beyond the scope of this research, we tried to address one aspect of what sexual satisfaction means for singles in our study by exploring its potential overlap with sexual frequency (measured in the data sets available to us as frequency of sex with others, and in one study, specifically opposite sex partners). If sexual satisfaction is primarily driven by having frequent sex with others, controlling for this variable should largely account for effects of sexual satisfaction (the focus on opposite sex partners notwithstanding). However, with the lack of research on the underpinnings of sexual satisfaction among singles, it is not clear if this definition of sexual frequency is too narrow (e.g., does not include frequency of solo sexual behaviors), a point to which we will return in the discussion.

## Study 1

### Method

**Participants.** We used data from the second wave of the National Survey of Families and Households (NSFH), which was collected between 1992 and 1994. The NSFH drew on a national probability sample of U.S. households and selected one adult per household as the primary respondent. The study covers topics related to family life, and Wave 2 included questions related to our study (see Sweet & Bumpass, 1996, for a full description of the study). For the purpose of this study, we analyzed data from never married and divorced single participants who completed self-enumerated booklets. Specifically, our sample included single people who were not cohabitating with a partner and who indicated that they did not have a steady boyfriend or girlfriend. Our final sample included 609 never married participants (271 men, 338 women;  $M_{\text{age}} = 40.73$ ;  $SD_{\text{age}} = 15.07$ ) and 797 divorced participants (232 men, 565 women;  $M_{\text{age}} = 49.41$ ;  $SD_{\text{age}} = 13.06$ ). Power analyses using G\*Power (Faul et al., 2009) suggested that given this sample size and level of significance at .005, we had adequate power ( $>.99$ ) for detecting a small effect ( $f^2 = .02$ ). Most of our participants were White ( $n = 977$ ), 295 were Black, 70 were Mexican/Chicano/Mexican American, and there were 30 Puerto Rican, 15 other Hispanic, 10 Asian, 5 American Indian, 2 Cuban, and 1 unidentified.

### Measures

**Desire to get married.** Three items were used to assess desire to get married ( $\alpha = .86$ ): “I would like to be married now,” “I would like to get married in the next year,” and “I would like to get married someday.” Responses were made on a scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*), and a composite was made with reverse-coded items so that higher scores represent greater desire to get married.

**Sexual satisfaction.** Participants responded to their overall satisfaction with their sex life on a scale ranging from 1 (*very dissatisfied*) to 7 (*very satisfied*).

**Sexual frequency.** Participants were asked a question, “About how often did you have sex with a partner of the opposite sex during the last month?” The response ranged from 0 to 50, with the majority of the participants (72%) reporting 0 (having had no sex in the past month).

**Life satisfaction.** Participants responded to a question, “Taking things all together, how would you say things are these days?” on a scale ranging from 1 (*very unhappy*) to 7 (*very happy*).

**Satisfaction with family.** Participants responded to their overall satisfaction with their family life from 1 (*very dissatisfied*) to 7 (*very satisfied*).

**Satisfaction with friends.** Participants responded to their overall satisfaction with their friendships from 1 (*very dissatisfied*) to 7 (*very satisfied*).

**Analysis plan.** In all three studies, we first present descriptive statistics and correlations, and then we present results from a regression model testing the links between sexual/social satisfaction variables and the outcome variable<sup>1</sup> (see Table 1). Then we additionally ran a model with life satisfaction controlled given that across the studies, our predictor variables (sexual/social satisfaction) were significantly related to life satisfaction (see Table 3 for regression models controlling for sociodemographic variables; also see Tables 4–6 for zero-order correlation results). Thus, to ensure that any effect we find with sexual/social satisfaction is not simply a reflection of high satisfaction with life in general, we ran a model with life satisfaction added as a covariate when there was a significant effect of sexual or social satisfaction. Finally, we also ran a model controlling for sexual frequency to explore its potential overlap with sexual satisfaction. Throughout our analyses and interpretations, we adopted a conservative alpha level ( $p = .005$ ) as suggested by Weston and colleagues (2019) to limit false-positive findings from secondary data analyses. We report standardized coefficients (partially standardized coefficients for logistic models in Study 2; Menard, 1995, 2011) throughout the article except for multilevel models in Study 3.

Of note, we also tested for any difference between never married and divorced single people in all three studies. We report collapsed results as there were no significant interactions suggesting differences between these two groups for any of our effects (but see <https://osf.io/vj5nb/> for separate descriptive statistics). All our models reported here include previous marriage history as a covariate along with other sociodemographic variables.

**Table 3.** Summary of Regression Models With Life Satisfaction as an Outcome Variable.

Variables	Study 1			Study 2			Study 3		
	$\beta$	<i>t</i>	<i>p</i>	$\beta$	<i>t</i>	<i>p</i>	$\beta$	<i>t</i>	<i>p</i>
Sex	-.04	-1.30	.19	.05	2.00	.05	-.04	-0.96	.006
Age	.04	1.49	.14	.21	7.18	<.001	-.02	-0.45	.34
Education	.08	3.05	.002	-.01	-0.27	.78	.11	2.94	.65
Income	.06	2.24	.03	.10	3.80	<.001	.10	2.71	.003
Marriage history	.01	0.39	.70	-.06	-1.39	.16	-.02	-0.39	.70
Child	-.04	-1.41	.16	-.02	-0.43	.67	.02	-0.45	.65
Sexual satisfaction	.14	4.95	<.001	.35	13.28	<.001	.12	3.37	<.001
Family satisfaction	.26	8.28	<.001	.30	10.83	<.001	.28	7.34	<.001
Friends satisfaction	.27	9.15	<.001	.10	3.60	<.001	.25	6.62	<.001
Adjusted $R^2$		.27			.30			.25	

Note. Marriage history is coded as 0 = never-married and 1 = one or more previous marriages; child is coded as 0 = none and 1 = one or more biological children. Data from Wave 1 were analyzed for Study 3. Standardized coefficients are reported.

**Table 4.** Descriptive Statistics and Correlations Among Variables (Study 1).

Variables	<i>M</i> ( <i>SD</i> )	1	2	3	4	5
1. Desire for marriage	2.82 (1.12)	—				
2. Sexual satisfaction	3.82 (2.09)	-.18**	—			
3. Sexual frequency	1.06 (3.49)	.08	.19**	—		
4. Life satisfaction	4.97 (1.44)	-.06	.30**	-.02	—	
5. Satisfaction with family	5.34 (1.63)	-.05	.36**	.01	.41**	—
6. Satisfaction with friends	5.52 (1.54)	-.06	.31**	.03	.43**	.48**

Note. Possible scores range from 1 to 7 for all variables except for desire for marriage which ranges from 1 to 5 and sexual frequency which ranges from 0 to 50.

\*\* $p \leq .001$ .

## Results

Table 4 shows the descriptive statistics and correlations among variables. We first ran a regression model to examine the link between the three satisfaction indices and desire to get married. A model controlling for sociodemographic variables (sex, age, education, personal income,<sup>2</sup> marriage history, and having/not having children) accounted for 11% of the variance (i.e., adjusted  $R^2$ ). We found that sexual satisfaction was negatively linked with the desire to get married,  $\beta = -.16$ ,  $t(1,247) = -5.34$ ,  $p < .001$ , suggesting that singles who were more sexually satisfied tended to have lower desire to get married. In contrast, satisfaction with family,  $\beta = .01$ ,  $t(1,247) = 0.39$ ,  $p = .70$ , and satisfaction with friends,  $\beta = .01$ ,  $t(1,247) = 0.17$ ,  $p = .86$ , were not significantly associated with desire to get married. The results did not change significantly in a model additionally controlling for life satisfaction,  $\beta = -.18$ ,  $t(1,076) = -5.52$ ,  $p < .001$ , for sexual satisfaction,  $\beta = .03$ ,  $t(1,076) = 0.78$ ,  $p = .44$ , for satisfaction with family,  $\beta = .01$ ,  $t(1,076) = 0.40$ ,  $p = .69$ , and for satisfaction with friends.

We also did not find any changes in the results when sexual frequency was included in the model, and sexual frequency was not significantly related to desire for marriage,  $\beta = .06$ ,

$t(1,163) = 2.04$ ,  $p = .04$ , without life satisfaction,  $\beta = .04$ ,  $t(1,007) = 1.61$ ,  $p = .11$ , and with life satisfaction included in the model. In sum, only sexual satisfaction emerged as a significant predictor of desire for marriage in Study 1 and its effect was unique from that of sexual frequency. In Study 2, we used another large data set to examine the links between sexual/social satisfaction and belief about whether happiness can be achieved without marriage.

## Study 2

### Method

**Participants.** We examined data from the National Survey of Midlife Development in the United States (MIDUS) which was based on a nationally representative sample of U.S. non-institutionalized, English-speaking adults. The study began in 1995 and participants were selected through random digit dialing (see Brim et al., 2004, for details of the study). At Wave 1, there were 612 never married individuals and 700 divorced individuals who fully completed a self-administered questionnaire and who indicated that they were not currently living with another person in a steady, marriage-like relationship. After additionally excluding those

who responded to the relationship section of the survey or did not respond to our key variables, our final sample consisted of 524 never married (267 men, 257 women;  $M_{\text{age}} = 38.30$ ;  $SD_{\text{age}} = 12.00$ ) and 591 divorced individuals (213 men, 378 women;  $M_{\text{age}} = 48.30$ ;  $SD_{\text{age}} = 10.50$ ). This sample size provided 98% power to detect a small effect ( $f^2 = .02$ ) at  $\alpha = .005$ . The majority of participants were White ( $n = 944$ ). Eighty-seven participants identified as Black and/or African American, 14 Asian or Pacific Islander, 12 multiracial, six Native American or Aleutian Islander/Eskimo, and 30 identified as other or were unidentified. Most participants identified their sexual orientation as heterosexual ( $n = 1,032$ ), 44 as homosexual, and 31 bisexual.

At Wave 2 (2004–2006; about 10 years after the first wave), 81% ( $n = 903$ ) of the sample completed the survey. We tested whether those who did and did not participate in the survey at Wave 2 differed in our key variables at baseline, and found that those who did participate in the survey at Wave 2 had reported lower sexual satisfaction,  $t(318) = 4.64$ ,  $p < .001$ , lower life satisfaction,  $t(395) = 4.21$ ,  $p < .001$ , less frequent sex,  $t(298) = 4.89$ ,  $p < .001$ , and lower-quality relationships with family,  $t(384) = 4.88$ ,  $p < .001$ , at baseline.

### Measures

**Belief that happiness can be achieved without marriage.** Participants rated two items (“Women can have full and happy lives without marrying,” and “Men can have full and happy lives without marrying”;  $\alpha = .78$ ) on a scale ranging from 1 (*agree strongly*) to 7 (*disagree strongly*). We computed a mean of the two items after reverse coding them so that higher values represent stronger beliefs that people can be happy without marriage.

**Sexual satisfaction.** Participants were asked to rate the sexual aspect of their life on a scale ranging from 0 (*the worst possible situation*) to 10 (*the best possible situation*).

**Sexual frequency.** Participants were asked a question, “Over the past six months, on average, how often have you had sex with someone?” and responded on a 6-point scale (1 = *two or more times a week*, 2 = *once a week*, 3 = *two or three times a month*, 4 = *once a month*, 5 = *less often than once a month*, and 6 = *never or not at all*). We recoded the responses so that higher values indicate greater frequency.

**Life satisfaction.** Participants were asked to rate their life overall on the same 11-point scale as for sexual satisfaction.

**Relationship quality with family.** Participants responded to four questions about their relationship with family (e.g., “How much does your family really care about you?”;  $\alpha = .86$ ). The items were rated on a scale ranging from 1 (*a lot*) to 4 (*not at all*).

**Relationship quality with friends.** Participants responded to an identical set of four questions asking about their relationship with friends (e.g., “How much do your friends really care about you?”;  $\alpha = .88$ ). For both relationship quality with family and friends, we made a composite so that higher values represent having relationships of higher quality.

**Remaining unmarried (being single).** At Wave 2, we identified people who had stayed unmarried since Wave 1 and were unpartnered at the time of the survey. Specifically, individuals at Wave 2 were coded as “having remained unmarried and being single” if they (a) reported having never been married at both Wave 1 and Wave 2 or, for those who were divorced at Wave 1, had not had another marriage by Wave 2; (b) indicated that they were not currently in a marriage-like relationship; and (c) did not respond to the relationship section of the survey. A total of 434 participants (48%) were coded as such (unmarried and single) at Wave 2.

### Results

Table 5 shows the descriptive statistics and correlations among variables. We first ran a regression model to examine the link between satisfaction variables and attitudes toward marriage. In a model controlling for sociodemographic variables (sex, age, education, household income, marriage history, and having/not having child; adjusted  $R^2 = .05$ ), we found that sexual satisfaction was positively linked with belief that people can be happy without marriage,  $\beta = .11$ ,  $t(1,093) = 3.66$ ,  $p < .001$ , suggesting that singles who were more sexually satisfied tended to believe that marriage is not a necessary condition for happiness. Similarly, single people who had higher-quality friendships were more likely to believe that people can be happy without marriage,  $\beta = .10$ ,  $t(1,082) = 3.13$ ,  $p = .002$ . However, having a high-quality relationship with family was not significantly associated with the belief that happiness can be achieved without marriage,  $\beta = -.009$ ,  $t(1,082) = -0.27$ ,  $p = .79$ .

In a model additionally controlling for life satisfaction, however, the effect of sexual satisfaction dropped to non-significance,  $\beta = .07$ ,  $t(1,068) = 2.18$ ,  $p = .03$ , while that of having high-quality relationships with friends,  $\beta = .09$ ,  $t(1,068) = 2.82$ ,  $p = .005$ , and having high-quality relationships with family,  $\beta = -.03$ ,  $t(1,070) = -0.98$ ,  $p = .33$ , remained similar. The results maintained an identical pattern in a model including sexual frequency, and sexual frequency did not emerge as a significant predictor of the belief that people can be happy without marriage,  $\beta = -.04$ ,  $t(1,070) = -1.14$ ,  $p = .25$ , without life satisfaction,  $\beta = -.03$ ,  $t(1,063) = -0.75$ ,  $p = .45$ , and with life satisfaction in the model.

Finally, we ran a logistic regression to examine if being sexually satisfied is related to the likelihood of remaining unmarried 10 years following the initial survey. In a model predicting relationship status at Wave 2 with sociodemographic variables controlled for (McFadden’s adjusted

**Table 5.** Descriptive Statistics and Correlations Among Variables (Study 2).

Variables	M (SD)	1	2	3	4	5
1. Belief that happiness can be achieved without marriage	5.73 (1.43)	—				
2. Sexual satisfaction	4.18 (3.21)	.10**	—			
3. Sexual frequency	2.56 (1.90)	-.001	.53**	—		
4. Life satisfaction	7.08 (1.85)	.16**	.36**	.08	—	
5. Family relationship quality	3.30 (0.68)	.05	.11**	.08	.38**	—
6. Friend relationship quality	3.25 (0.66)	.13**	.11**	.06	.25**	.36**

Note. Possible scores range from 1 to 7 for belief about happiness; 0 to 10 for sex and life satisfaction; 1 to 6 for sexual frequency; and 1 to 4 for family and friend relationship quality.

\*\* $p \leq .001$ .

$R^2 = .06$ ), sexual satisfaction emerged as a significant predictor,  $\beta = -0.20$ , Wald = 7.71,  $p = .005$ , odds ratio (OR) = 0.94, 99% confidence interval (CI) = [0.88, 0.99]. For each unit increase in sexual satisfaction, participants were 6% less likely to have remained unmarried by Wave 2. In contrast, we did not find any significant effects with relationship with family or friends ( $\beta = 0.05$ , Wald = 0.47,  $p = .49$ , OR = 1.08, 99% CI = [0.81, 1.43] for family, and  $\beta = 0.11$ , Wald = 2.00,  $p = .16$ , OR = 1.18, 99% CI = [0.88, 1.58] for friends).

However, when life satisfaction was included in the model, the effect of sexual satisfaction dropped to non-significance,  $\beta = -0.19$ , Wald = 6.18,  $p = .01$ , OR = 0.94, 99% CI = [0.88, 1.002]. In contrast, in a model including sexual frequency, we found that sexual frequency was a consistent predictor of likelihood of having remained unmarried. Specifically, those who reported having more frequent sex at Wave 1 were less likely to have remained unmarried by Wave 2. These effects held in both models with and without life satisfaction ( $\beta = -0.32$ , Wald = 12.62,  $p < .001$ , OR = 0.84, 99% CI = [0.74, 0.95], and  $\beta = -0.32$ , Wald = 12.67,  $p < .001$ , OR = 0.84, 99% CI = [0.74, 0.95], respectively).

### Summary

In two studies, single people who were more (vs. less) sexually satisfied had less desire for marriage and more strongly endorsed that people can be happy without marriage although the latter effect dropped to non-significance after controlling for life satisfaction. We did not find any effect with having satisfying or high-quality relationships with family, but high-quality relationships with friends was associated with a belief that people can be happy without marriage. Nevertheless, given the specific measures we used (i.e., desire for and beliefs about marriage), our results cannot speak directly to whether a sexually/socially satisfying life is related to satisfaction with one's *singlehood*. In Study 3, we used a direct measure of satisfaction with singlehood as well as a more general measure of wanting a relationship (rather than marriage). Using multi-wave data, we also examined within-person associations between sexual/social satisfaction and satisfaction with singlehood in Study 3.

We also found weak evidence in Study 2 regarding the predictive power of sexual satisfaction on the likelihood of having remained unmarried; what emerged as a stronger predictor instead was sexual frequency. However, there is an issue with the MIDUS data set, which is that we could not identify single people who were casually dating at baseline. In Study 3, we used a data set in which relationship status was better specified to be able to identify more casual daters.

## Study 3

### Method

**Participants.** We analyzed 10-year data from the German Family Panel study (pairfam), which is an ongoing longitudinal study on couple and family dynamics that started in 2008 (see Huinink et al., 2011, for details about the study). The study sample included three different cohorts: adolescents (born in 1991–1993), young adults (born in 1981–1983), and mid-life adults (born in 1971–1973), who were contacted and asked to complete a survey every year. For multilevel modeling analyses examining within- and between-person associations between variables, we examined reports from young and midlife adults who had more than 2 years in which they were single, responded to the sexual satisfaction question, and completed the section of the survey for singles. This sample included 1,125 never married individuals (699 men, 425 women, 1 unidentified;  $M_{\text{age}} = 28.92$  and  $SD_{\text{age}} = 4.69$  at baseline), 157 divorced individuals (60 men, 97 women;  $M_{\text{age}} = 34.68$  and  $SD_{\text{age}} = 3.68$  at baseline), and their 5,509 reports. Power estimation based on Monte Carlo simulation (500 repetitions) using the simr package (Arend & Schäfer, 2019) in R showed that this sample size provided adequate power (>99%) to detect a standardized Level 1 effect of small size (.10) at  $\alpha = .005$  in two-level models. The majority of the participants ( $n = 1,007$ ) were German native and there were 90 with other non-German background, 84 half-German, 49 Ethnic-German immigrants (Aussiedler), 16 with Turkish background, and 36 unidentified. All but 42 participants identified as heterosexual at baseline, and there were 39 who did not answer. For the second part of the analyses (predicting the likelihood of being single in the following annual

**Table 6.** Descriptive Statistics and Correlations Among Variables (Study 3).

Variables	M (SD)	1	2	3	4	5	6
1. Satisfaction with singlehood	5.64 (1.99)	—					
2. Desire for a partner	3.72 (0.89)	-.37**	—				
3. Sexual satisfaction	4.35 (2.10)	.21**	-.12**	—			
4. Sexual frequency	1.93 (1.19)	.08**	.0004	.34**	—		
5. Life satisfaction	6.65 (1.59)	.21**	-.04	.10**	.03	—	
6. Satisfaction with family	7.61 (1.83)	.08**	-.01	.06**	.02	.16**	—
7. Satisfaction with friends	7.35 (1.75)	.15**	-.03	.09**	.04	.19**	.39**

Note. Possible scores range from 0 to 10 for all variables except for desire for a partner which ranged from 1 to 5. Aggregates were used for means and standard deviations, and within-person correlations were calculated using the *rmcorr* package (Bakdash & Marusich, 2018) in R.

\*\* $p \leq .001$ .

surveys), we tracked relationship status of all participants ( $n = 1,314$ ) who were single at baseline and had at least one follow-up report by Wave 10.

#### Measures

**Satisfaction with singlehood.** Participants indicated how satisfied they were with their situation as a single on a scale ranging from 0 (*very dissatisfied*) to 10 (*very satisfied*).

**Desire for a partner.** Participants indicated to what degree they would like to have a partner on a scale from 1 (*not at all*) to 5 (*absolutely*).

**Sexual satisfaction.** Participants indicated how satisfied they were with their sex life on a scale ranging from 0 (*very dissatisfied*) to 10 (*very satisfied*).

**Sexual frequency.** Participants responded to a question, “How often have you had sexual intercourse on average during the past three months?” on a 8-point scale (0 = *I have never had sex*, 1 = *not in the past 3 months*, 2 = *once per month or less*, 3 = *2–3 times per month*, 4 = *once per week*, 5 = *2–3 times per week*, 6 = *more than 3 times per week*, and 7 = *daily*). As this question was included in the survey starting at Wave 2, additional analyses controlling for sexual frequency were not run when the analyses used Wave 1 data (i.e., a model predicting the likelihood of being single).

**Life satisfaction.** Participants indicated how satisfied they were with their life overall on the same 11-point scale as above.

**Satisfaction with family.** Participants indicated how satisfied they were with their family on the same 11-point scale as above.

**Satisfaction with friends.** Participants indicated how satisfied they were with their social contact/friends on the same 11-point scale as above.

**Likelihood of being single.** To predict the participants’ likelihood of being single for the following 9 years, we first created a binary variable (0 = *not single*, 1 = *single*) each year based on their relationship status, and divided the number of their reports of being single by the total number of reports provided.

#### Results

Descriptive statistics and correlations among all variables are shown in Table 6. To examine if a satisfying sex life is linked with satisfaction with singlehood, we ran two models predicting each outcome (satisfaction as single and desire for a partner) with sociodemographic variables (gender, age, education, marriage history, and having/not having child) and sexual or social satisfaction as predictors. To take into account both within- and between-person effects, each model included a grand mean centered aggregate of the predictor (e.g., an average level of sexual satisfaction across singlehood) and a person-centered variable (e.g., a varying level of sexual satisfaction for each year of being single). All analyses were conducted using *lme4* package (Bates et al., 2014) in R.

As shown in Table 7 (left column), individuals who were, on average, highly sexually satisfied as single tended to be more satisfied with singlehood. Furthermore, higher than the average levels of sexual satisfaction for a given year were linked with higher satisfaction with being single. That is, singles were more satisfied in their single status if they were generally satisfied in their sex life and/or in a year in which they had a particularly satisfying sex life. Similarly, both within- and between-person effects of friend satisfaction were significantly linked with satisfaction in singlehood. However, no effect was found with within- or between-person effects of family satisfaction.

With desire for a partner as an outcome (right column of Table 7), we found significant within- and between-person effects of sexual satisfaction. Singles had less desire for a partner if they were generally sexually satisfied and/or in a year in which they had a particularly satisfying sex life. However, neither family nor friend satisfaction had unique

**Table 7.** Summary of Results With All Predictors (Study 3).

Variables	DV: satisfaction with singlehood				DV: desire for a partner			
	<i>b</i>	<i>t</i>	<i>p</i>	<i>r</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>r</i>
Gender	0.23	2.21	.03	.06	-0.10	-1.89	.06	.05
Age	0.06	5.07	<.001	.15	-0.01	-2.50	.01	.07
Education	-0.04	-1.81	.07	.05	0.01	1.17	.24	.03
Marriage history	-0.63	-3.38	.007	.09	0.48	5.32	<.001	.14
Child	0.09	0.57	.57	.02	-0.15	-2.00	.05	.06
Sexual satisfaction (W)	0.18	13.19	<.001	.20	-0.05	-7.96	<.001	.12
Sexual satisfaction (B)	0.33	13.43	<.001	.35	-0.12	-9.96	<.001	.26
Family satisfaction (W)	0.03	1.41	.16	.02	-0.001	-0.17	.87	.003
Family satisfaction (B)	0.08	2.57	.01	.07	-0.001	-0.08	.93	.002
Friend satisfaction (W)	0.15	7.28	<.001	.11	-0.007	-0.84	.40	.01
Friend satisfaction (B)	0.16	4.51	<.001	.13	0.001	0.10	.92	.003
<i>R</i> <sup>2</sup> (MVP)	.15				.07			

Note. (W) = within-person effect; (B) = between-person effect; marriage history is coded as 0 = never-married and 1 = one or more previous marriages; child is coded as 0 = none and 1 = one or more biological children. Unstandardized coefficients are reported. Effect sizes were computed using  $r = \sqrt{(t^2 / t^2 + df)}$  from Rosenthal and Rosnow (2007). Calculation of total variance explained (*R*<sup>2</sup>) was based on multilevel variance partitioning (MVP; LaHuis et al., 2014). DV = dependent variable.

**Table 8.** Summary of Results With All Predictors in a Model Controlling for Life Satisfaction (Study 3).

Var	DV: satisfaction with singlehood				DV: desire for a partner			
	<i>b</i>	<i>t</i>	<i>p</i>	<i>r</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>r</i>
Gender	0.24	2.43	.02	.07	-0.10	-1.94	.05	.05
Age	0.05	4.79	<.001	.14	-0.01	-2.36	.02	.07
Education	-0.07	-3.52	.005	.10	0.02	1.66	.10	.05
Marriage history	-0.60	-3.40	.007	.09	0.47	5.31	<.001	.14
Child	0.10	0.70	.48	.02	-0.15	-2.04	.04	.06
Sexual satisfaction (W)	0.17	12.36	<.001	.19	-0.05	-7.77	<.001	.12
Sexual satisfaction (B)	0.27	11.18	<.001	.30	-0.11	-8.97	<.001	.24
Family satisfaction (W)	0.01	0.27	.78	.004	0.0001	0.02	.99	.003
Family satisfaction (B)	-0.01	-0.36	.72	.01	0.01	0.81	.42	.02
Friend satisfaction (W)	0.12	5.79	<.001	.09	-0.005	-0.52	.60	.008
Friend satisfaction (B)	0.06	1.68	.09	.05	0.02	1.00	.32	.03
Life satisfaction (W)	0.24	11.48	<.001	.17	-0.02	-1.88	.06	.03
Life satisfaction (B)	0.40	11.02	<.001	.30	-0.06	-3.44	.006	.09
<i>R</i> <sup>2</sup> (MVP)	.20				.08			

Note. (W) = within-person effect; (B) = between-person effect; marriage history is coded as 0 = never-married and 1 = one or more previous marriages; child is coded as 0 = none and 1 = one or more biological children. Unstandardized coefficients are reported. Effect sizes were computed using  $r = \sqrt{(t^2 / t^2 + df)}$ . Calculation of total variance explained (*R*<sup>2</sup>) was based on multilevel variance partitioning (MVP; LaHuis et al., 2014). DV = dependent variable.

effects on desire for a partner at the within-person or between-person level.

As in previous studies, we also ran the models controlling for life satisfaction (Table 8). In a model with satisfaction with being single as an outcome, both within- and between-person effects of sexual satisfaction remained significant. In contrast, although the within-person effect of friendship satisfaction remained significant, the between-person effect of friendship satisfaction dropped to non-significance. Similarly, sexual satisfaction effects remained robust even after controlling for life satisfaction in a model with desire for a partner as an outcome.

Finally, we ran a model controlling for sexual frequency. We found that people who on average reported a higher frequency of sexual intercourse were less satisfied with being single,  $b = -0.22$ ,  $t(1,300) = -4.16$ ,  $p < .001$ , in a model without life satisfaction,  $b = -0.20$ ,  $t(1,300) = -3.95$ ,  $p < .001$ , and in a model controlling for life satisfaction. However, including sexual frequency did not significantly change any other effects.

Similarly, we found significant between-person effects of sexual frequency in a model predicting desire for a partner,  $b = 0.09$ ,  $t(1,319) = 3.65$ ,  $p < .001$ , in a model without

life satisfaction,  $b = 0.09$ ,  $t(1,319) = 3.54$ ,  $p < .001$ , and in a model controlling for life satisfaction. Furthermore, there were also significant within-person effects of sexual frequency on desire for a partner,  $b = 0.05$ ,  $t(3,076) = 3.32$ ,  $p < .001$ , in a model without life satisfaction,  $b = 0.05$ ,  $t(3,074) = 3.32$ ,  $p < .001$ , and in a model controlling for life satisfaction. That is, not only did singles who on average had more frequent sex want a partner more, but singles also wanted a partner more during years when they reported having particularly frequent sex. Importantly, however, including sexual frequency in the model did not significantly change any other effects.

### Predicting Single Status

Finally, we examined if satisfying sexual or social aspects of life are related to the likelihood of being single over the next 9 years. We ran a regression model with all factors at baseline (i.e., sociodemographic variables and sexual/social/life satisfaction) included as predictors of the proportion of yearly surveys completed by Wave 10 indicating single status. The results showed that only sexual satisfaction emerged as a significant predictor,  $\beta = -0.12$ ,  $t = -4.05$ ,  $p < .001$ , such that those with higher levels of sexual satisfaction tended to have fewer reports in the following years of being single (adjusted  $R^2 = .04$ ). We also conducted another test for predicting *long-term* singlehood by examining whether or not participants reported being single in *all* their reports (i.e., there was no yearly report in which the participant indicated being in a relationship). The results from a logistic regression model (McFadden's adjusted  $R^2 = .13$ ) showed the same pattern as in the previous approach such that those who were higher in sexual satisfaction,  $b = -0.07$ , Wald = 8.79,  $p = .003$ , OR = 0.94, 99% CI = [0.88, 0.99], were less likely to be single throughout their reports.

### General Discussion

We found that single individuals with higher sexual satisfaction tended to have less desire to marry (Study 1), believe that unmarried people can be happy (Study 2), have less desire for a partner and be more satisfied with singlehood (Study 3). Except for Study 2, the effects were robust even after controlling for general life satisfaction. On the other hand, the results regarding the role of friendships showed a different pattern; having a high-quality or satisfying relationship with friends was associated with the belief that unmarried people can be happy (Study 2) as well as satisfaction with being single (Study 3), arguably both variables about the possibility of being happy as a single person. However, satisfaction with friend relationships was not associated with desire for marriage (Study 1) or desire for a partner (Study 3). Combined, these data suggest that single individuals' relationship with friends may be tied to how they feel and think about singlehood, but not necessarily to their desire for

alternative options (marriage or partnership). Although we did not predict this a priori, it is conceivable that how people feel about friends is less directly linked with desire for alternative relationship status than is sexual satisfaction. For example, feeling sexually dissatisfied may be more easily attributed to one's lack of a romantic partner (given that a large percentage of sexual opportunities arise within established relationships; Willetts et al., 2004) than feeling dissatisfied with friendship is, and thus affect how much they would want to be in a relationship. That is, having good friends may make a single life better, but may not reduce an itch for a romantic partner in the way that a satisfying sexual life might.

In contrast, we did not find any significant effect of having satisfying relationships with family across the three studies. One way to explain these null effects is that family relationships can have multiple indirect effects on single people's view on singlehood and its alternatives that might lead to pressures in conflicting directions. For example, while family members can ease single people's concerns about not having a partner by fulfilling their intimacy needs, family pressures to marry (Himawan et al., 2018; Jennings et al., 2012) can also make them feel frustrated about their single status and lower their intrinsic motivation to date.

In Study 3, we also found evidence that higher sexual satisfaction was associated with lower likelihood of staying single over time, which is curious considering the link between sexual satisfaction and less reported desire for a relationship. One possible explanation may be that high sexual satisfaction at baseline was partly a reflection of greater availability of partners, whether physically being in an environment with an abundance of partners and/or the participant being higher in mate value. Greater partner availability increases the chances of encountering highly desirable partners who may be attractive even for those with less desire for a partner. This idea is further supported by our finding in Study 2 in which sexual frequency emerged as a predictor of staying unmarried across a 10-year timespan, above and beyond any effect of sexual satisfaction. Nevertheless, as this idea is speculative and was not tested given the exploratory nature of the analyses and the use of existing data sets, specific mechanisms underlying these findings warrant future research.

Although preliminary, the present findings were based on large samples and the effects of sexual satisfaction were robust across different outcomes related to evaluations of singlehood and its alternatives. Our research provides the first empirical evidence for the role of having a satisfying sex life for maintaining satisfaction with singlehood and thus highlights the need for in-depth investigations of sexuality in singlehood. Indeed, the sexual aspect of single people's lives has received little empirical attention, and the few existing studies on single people's sexual satisfaction have been mostly for descriptive and comparative purposes (i.e., comparison with married individuals; Antičević et al., 2017).

One important question that should be addressed as the first step to expanding research on sexuality among singles involves defining sexual satisfaction among singles (see McClelland, 2010). Although there are many ways to approach this question, including starting with qualitative research (McClelland, 2011), researchers could also draw on and generalize previous research on sexual satisfaction conducted using partnered individuals. For example, Lawrance and Byers (1995) conceptualized sexual satisfaction within established relationships as an “affective response arising from one’s subjective evaluation of the positive and negative dimensions associated with one’s sexual relationship” (p. 268); following this, sexual satisfaction among singles can be defined with a focus on the affective response, but with regard to evaluation of one’s overall sex life (encompassing both partnered and unpartnered experiences) rather than of a sexual relationship with one particular partner.

Alternatively, future research can also draw on research on satisfaction in other domains. For example, conceptualizing satisfaction as a function of the discrepancy between an actual and desired state (Solberg et al., 2002), researchers can explore what single people want in their sex lives, what they currently have, and the discrepancy or congruence between them. This approach is particularly well-suited for accommodating people with varying sexual interest and desires (see Bogaert, 2006, for review on asexuality), and will allow for more nuanced conclusions about the role of sexuality in maintaining satisfying singlehood. For example, we could address questions such as if sexually inactive singles with low sexual desire (i.e., sexual satisfaction derived from the want-have congruency at low levels) are more or less satisfied with singlehood as singles with high sexual desire who have all their sexual needs met (i.e., want-have congruency at high levels). If sexually satisfied singles due to low desire and low activities are indeed just as satisfied with being single, interpreting our findings as suggesting the importance of maintaining an active, fulfilling sexual life would be misleading.

Having a better understanding of sexual satisfaction among singles is also an important step to addressing a critical limitation of the current research, measurement of sexual satisfaction. Across the three studies, we used a single-item measure of sexual satisfaction which comes with questions about psychometric quality (Gardner et al., 1998). Although previous work has demonstrated some convergent validity of a single-item measure of sexual satisfaction with other existing measures (Mark et al., 2014), that work was conducted in the context of established relationships. Specifically, that research showed that among coupled individuals, a single-item measure of sexual satisfaction performed similarly to the Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995) and the New Sexual Satisfaction Scale-Short form (NSSS-S; Štulhofer et al., 2010), both of which ask about experiences in partnered sexual activities. Accordingly, it warrants a separate investigation as to

whether a single-item measure of sexual satisfaction is a valid way to assess sexual satisfaction among singles. In such an investigation, existing scales will need to be revised to account for the fact that questions about partnered sexual experiences may be interpreted differently among singles. For example, researchers may need to change the question instructions (e.g., asking to think about overall sex life rather than sexual relationship with a current partner as in the GMSEX) or revise the items about partnered sex so that it is clear it is not about one particular partner. In addition, to directly examine the potential heterogeneity among singles in the way scales (including items about partnered sexual experiences) are interpreted, researchers can also test measurement invariance of sexual satisfaction scales among different types of singles (e.g., with vs. without a stable sex partner).

Finally, we emphasize that as exploratory as our research was, there may be important nuances in our effects that we could not examine with the available data and that should be addressed in future research. For example, it is possible that variability in the specific family members about which people were thinking (e.g., parents, siblings) obscured effects regarding family relationships, suggesting the need to separately examine relationships with different family members. Furthermore, the outcome variables in our three studies were not identical (see Table 1), which, on one hand, highlights the robustness of our effects that were consistent across the studies, but on the other hand, also raises the question of whether these measurement differences drove some of the inconsistencies in results. Indeed, questions about satisfaction with singlehood (as in Study 3) and its alternatives (e.g., marriage as in Studies 1 and 2) are conceptually different and it is conceivable that (as suggested by effects tying high-quality friendships to singlehood satisfaction but not desire for a partner) what contributes to satisfying singlehood may not be entirely the same as what contributes to one’s desire for a relationship. Thus, to gain a more precise understanding of what role different factors play in single people’s feelings and beliefs about singlehood, researchers may need to carefully consider their outcome(s) of interest.

The growing number of single people underscores the need for deeper investigation into single lives. Our research demonstrates that having a satisfying sexual life can uniquely contribute to how positively single people view their own relationship status and thus shed much needed light on potential paths to single people’s well-being.

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**Supplemental Material**

Supplemental material is available online with this article.

**Notes**

1. Across the three studies, we also ran three separate models testing the links between each one of the three satisfaction variables (sex, family, and friends) and the outcome variable. The results from these models are similar to the results from a comprehensive model (including all three predictors) reported here.
2. We controlled for personal income instead of household income in Study 1 given that using household income resulted in a large drop in the sample size due to missing data. We did not include household or personal income in Study 3 models as the sample size was almost halved with either included. However, in both studies, the pattern of effects largely remains the same with household income included in the models.

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