



How do sexual activity and sexual satisfaction relate to levels of relationship desire?[☆]

Elyakim Kislev^{a,*}, F. Sid Dougan^b

^a School of Public Policy and Governance, The Hebrew University of Jerusalem, Jerusalem, Israel

^b Department of Psychology, The University of Texas at Austin, Texas, United States

ARTICLE INFO

Keywords:

Sexual satisfaction
Sex frequency
Relationship desire
Sexual strategies

ABSTRACT

Sexual satisfaction and access to sexual activity outside committed relationships may be associated with individuals' motivation to pursue a long-term partner. We examined whether within-person changes in sexual satisfaction and intercourse frequency were associated with relationship desire among never-married men and women. Using all fourteen waves of the German Panel Analysis of Intimate Relationships and Family Dynamics (Pairfam), individual fixed-effects models linked change between successive waves to relationship desire at the later wave. Increases in sexual satisfaction were associated with lower relationship desire for men ($b = -0.024$, $p < .001$) and women ($b = -0.026$, $p < .001$), with no significant sex difference. Changes in intercourse frequency were not significantly associated with relationship desire in either sex. From an evolutionary perspective, these findings are consistent with relationship motivation being calibrated to cues about the benefits of long-term pair-bonding relative to other mating opportunities. Greater sexual satisfaction while single may indicate that some mating benefits are obtainable without commitment, whereas sexual frequency appears to provide a less consistent cue.

1. Introduction

Humans face a recurrent trade-off between pursuing short-term sexual opportunities and investing in long-term pair-bonds (Buss & Schmitt, 1993, 2019; Trivers, 1972). From an evolutionary perspective, the motivation to form a committed relationship should be facultatively calibrated in response to cues about the availability of mating opportunities (Gangestad & Simpson, 2000). When sexual access is readily obtainable without commitment, the marginal benefits of entering a pair-bond may decline, as individuals can pursue mating opportunities without incurring the costs of long-term investment.

Two variables are especially relevant to this calibration process: sexual frequency and sexual satisfaction. Sexual frequency may index the availability of short-term mating opportunities, whereas sexual satisfaction may provide feedback about the outcomes of those encounters. In contrast, desire for a partner reflects motivation toward long-term pair-bonding. These constructs therefore tap into partially distinct motivational systems and should not be assumed to move in tandem.

Prior research provides some support for associations between these

aspects of sexual experience and relationship desire. Most notably, Park et al. (2021, Study 3) examined the same measures of sexual satisfaction, intercourse frequency, and desire for a partner among singles using 10 years of Pairfam data through Wave 10. Using multilevel models that separated between-person differences from within-person deviations around each individual's average, they found that singles reported less desire for a partner during years in which their sexual satisfaction was higher than usual, but greater desire for a partner during years in which their intercourse frequency was higher than usual. Kislev (2021) likewise used Pairfam data to examine associations between sexual experiences and voluntary singlehood. Building directly on this prior work, the present study addresses a distinct question that remains unresolved by these analyses. Whereas Park et al.'s within-person analysis asked whether individuals reported different levels of relationship desire when their sexual satisfaction or intercourse frequency was above or below their own typical level across observations, the present study asks whether relationship desire is associated with an increase or decrease in these sexual experiences since the preceding year's observation. These two forms of within-person variation are not equivalent: for example, an individual's intercourse frequency could remain above their typical level

[☆] This article is part of a Special issue entitled: 'Evolutionary Perspectives on Singlehood' published in Evolution and Human Behavior.

* Corresponding author.

E-mail address: elyakim.kislev@mail.huji.ac.il (E. Kislev).

even though it has declined since the preceding observation. Drawing on the complete 14-wave Pairfam panel and a differently defined sample of singles, the analyses include never-married individuals who were single in both the current and immediately preceding wave. This distinction allows the present study to test whether previously reported within-person associations generalize from deviations around an individual's typical level to recent within-person changes.

1.1. Sexual satisfaction and sex frequency

From an evolutionary perspective, sexual satisfaction may serve as feedback on the payoff of current mating arrangements and thereby calibrate investment in long-term pair bonding. Sexual frequency may instead index access to mating opportunities. This distinction motivates the comparison below.

Sexual satisfaction is defined as the affective response or feedback that informs individuals' evaluation of their sexual relationship and the extent to which their sexual desires are met (Offman & Matheson, 2005). From a functional perspective, such evaluations may also provide information relevant to mating decisions, rather than simply reflecting individuals' subjective evaluations of their sexual experiences. Sexual satisfaction has been shown to influence one's overall sense of relationship fulfillment and to improve overall marital and life satisfaction (Stephenson & Meston, 2015). For this reason, many scholars have looked into both interpersonal and intrapersonal variables related to sexual satisfaction, such as sexual preoccupation (thinking about sex most of the time) (Snell Jr & Papini, 1989), sexual competence (confidence and positive feelings enabling one to enjoy and get satisfaction from sex) (Pujols et al., 2010), and sexual depression (lack of happiness regarding one's sex-life) (Ménard & Offman, 2009; Rostovsky et al., 2008).

Many researchers have also analyzed the experiences of men and women separately to determine sex-specific correlators of sexual satisfaction (Haavio-Mannila & Kontula, 1997; Laumann et al., 2006; Leal & Castilho, 1998; Moret et al., 1998). For example, McNulty and Fisher (2008) found that women's sexual satisfaction is shaped by expectations for a long-term relationship. For men, it is derived from the physical aspects of sex, such as sex frequency. Sprecher (2002) showed similarly that the association between sexual satisfaction and the quality of the relationship in non-marital relationships is stronger for men than for women. From an evolutionary perspective, such differences are consistent with sex-differentiated mating trade-offs, whereby men and women may, on average, differ in how sexual access and relationship investment contribute to reproductive outcomes, even though substantial overlap is expected.

Sex frequency is typically measured directly by asking participants how often they have sex with a partner within a specific timeframe (Warehime & Bass, 2008). Previous findings on the relation between sexual frequency and pleasure are mixed (Laumann et al., 1994; Leal & Castilho, 1998; Pedersen & Blekesaune, 2003; Sprecher, 2002). Some studies report that more frequent sex and a greater number of orgasms are associated with enhanced emotional and physical fulfillment during sex (Waite & Joyner, 2001a, 2001b), whereas others find sex differences in this association. McNulty and Fisher (2008), for example, found that higher sex frequency positively correlates with greater sexual satisfaction for men alone. Other studies conducted among women in college (Davidson Sr & Hoffman, 1986) report a positive correlation between sex frequency and sexual fulfillment.

From an evolutionary viewpoint, both sexual frequency and sexual satisfaction can act as cues that calibrate the allocation of mating effort. Sexual Strategies Theory (Buss & Schmitt, 1993) and Strategic Pluralism Theory (Gangestad & Simpson, 2000) propose that individuals adjust their mating strategies in response to perceived costs, benefits, and opportunities in the mating market. Sex frequency may reflect the availability or ease of obtaining mating opportunities, whereas sexual satisfaction may provide feedback about the payoffs of those encounters.

When individuals can obtain sexual access without long-term commitment, the incentive to invest in pair-bonding may be reduced. These variables are therefore relevant not only to wellbeing but also to the regulation of mating strategies.

However, these calibration processes may not operate identically across sexes. From an evolutionary perspective, men and women have historically faced partially different trade-offs between short-term mating opportunities and long-term pair-bonding investment (Buss & Schmitt, 1993, 2019; Trivers, 1972). Because female reproductive success has, on average, been more closely tied to securing sustained partner investment, whereas male reproductive success has been more contingent on access to mating opportunities, cues such as sexual frequency and sexual satisfaction may have different implications for relationship desire. In particular, sexual access without commitment may reduce the marginal benefits of pair-bonding more strongly for one sex than the other, leading to sex-differentiated associations between these variables and motivation to pursue a committed relationship. Examining whether these associations differ between men and women is therefore important for understanding how mating-related cues shape relationship desire.

1.2. Relationship desire

To situate the term *relationship desire* within the existing literature, one needs to distinguish it from related concepts (Kislev, 2024; Kislev & Marsh, 2023). The basic distinction between voluntary and involuntary singlehood was initially proposed by Stein (1975). According to Stein, voluntary singles are a subgroup of singles: "single people do indeed have a choice and a growing number of them are exercising that choice consciously and voluntarily, to pursue lifestyles that will meet their needs for human growth and supportive interpersonal relationships" (Stein, 1975 p. 489). Indeed, studies that distinguished between voluntary and involuntary singlehood with respect to subjective wellbeing measures found voluntary singlehood to be associated with favorable outcomes (Adamczyk, 2017; Apostolou et al., 2019; Kislev, 2022a, 2022b).

Broadly speaking, low relationship desire is a characteristic of singles by choice (Slonim et al., 2015; Slonim & Schütz, 2015b), voluntary singles (Adamczyk, 2017), or 'new singles' (DePaulo, 2015, 2023), but it might not capture all traits of these broader definitions. Therefore, the definition proposed in this study focuses on whether one intends to have a partner in the near future, a prominent feature of the aforementioned definitions. This measure, also used in the previous studies on the effect of sexual gratification mentioned above (Kislev, 2021; Park et al., 2021), is tested longitudinally here. It avoids retrospective or value-laden interpretations of singlehood (Ermer & Keenoy, 2023; Fitzpatrick, 2023; Girmé et al., 2023). Instead, this study measures singles by the degree to which they seek a relationship (see also in Slonim & Schütz, 2015a). In the present framework, this measure is treated as a proximate indicator of underlying motivation toward long-term pair-bonding.

The reasons people choose to be single and, by extension, exhibit low relationship desire are numerous and varied (Beckmeyer & Jamison, 2023a, 2023b; Bergström & Brée, 2023; Lehmann et al., 2015). Unwillingness to compromise in finding a partner, the pursuit of a career, desire for independence, religious reasons, and preferences for solitude are among the reasons cited for low relationship desire (Adamczyk & Trepanowski, 2023; Girmé et al., 2023; Kislev, 2019; Pepping et al., 2018; Prabhakar, 2011). While some may consider singlehood a choice, a low level of relationship desire may also arise from a negative self-image, fear, or unrequited love (Jakobsson & Hallberg, 2005; Spielmann et al., 2016). In their study of heterosexual adults, Frazier et al. (1996) listed a variety of personal reasons for a low level of relationship desire, including not meeting the right person, marriage priority, difficulties in establishing relationships, fear that the relationship will not work, and the belief that all good partners are already "taken" (MacDonald & Park, 2022; Pepping et al., 2018; Pepping & MacDonald,

2019).

Another way of organizing determinants of relationship desire is to group the reasons for relationship desire into broader categories. Adamczyk (2017) suggested that there are three main categories of reasons for a low level of relationship desire: personal choice, external circumstances, and personal deficits or self-blame. The first category includes the view that life would not be improved by being in a relationship. The second category involves perceived external barriers to a relationship, such as not meeting the right person or not having feelings reciprocated. The third category involves dissatisfaction with oneself, such as being unattractive or not “good enough” to find a partner.

Evolutionary approaches complement these sociocultural explanations by treating relationship desire as part of an evolved motivational system governing long-term pair-bonding. Such motivation is expected to vary facultatively (Buss & Schmitt, 1993; Gangestad & Simpson, 2000): when external conditions or access to sexual opportunities without commitment lower the marginal benefits of commitment, desire for a committed relationship may decline. This functional perspective provides an evolutionary basis for understanding individual and sex-linked differences in the motivation to pursue relationships.

1.3. The association of sexual satisfaction and sex frequency and relationship desire

Despite prior research linking sexual satisfaction and sexual frequency to relationship desire among singles, questions remain regarding whether these associations generalize across different operationalizations of within-person change. Understanding these associations is increasingly relevant given broader shifts toward more liberal attitudes regarding premarital sex and single living (Berntson et al., 2014; Kislev, 2021; Pham, 2017). Casual sexual activity between two or more individuals has grown steadily in recent years (Wade, 2017; Zheng et al., 2017). Repeated hookups take the form of “friends with benefits” or become purely sexual in nature (Pham, 2017; Wade, 2017). Even in religious societies, studies indicate a shift in moral authority, thereby allowing a more liberal approach to premarital sex (Farrell, 2011; Sharma, 2015; Zion-Waldoks, 2015).

Taken together, the growing availability of non-committed sexual opportunities may recalibrate mating effort in ways described by Sexual Strategies Theory (Buss & Schmitt, 1993) and Strategic Pluralism Theory (Gangestad & Simpson, 2000): when sexual gratification is attainable without commitment, the marginal benefits of forming a pair-bond may decline, lowering immediate desire for a committed relationship. The longitudinal analyses below examine this proposition by testing whether changes in sexual satisfaction and sex frequency are associated with relationship desire at the successive wave.

Notably, prior evidence concerning intercourse frequency runs counter to this theoretical prediction. Park et al. (2021) found that singles reported greater desire for a partner during years in which their intercourse frequency was higher than usual. However, being above one's typical level of intercourse frequency is conceptually distinct from having recently experienced an increase in intercourse frequency. The present analysis examines the latter, testing whether changes in intercourse frequency from the preceding year's observation are associated with current relationship desire. This provides a test of whether the previously observed positive association reflects a robust within-person pattern or depends on how within-person variation in intercourse frequency is operationalized.

The current study tests two hypotheses regarding the links between sexual satisfaction, sex frequency, and relationship desire in a longitudinal analysis of the Pairfam study. Phrased in longitudinal terms, the hypotheses are:

H1. Over time, an increase in sexual satisfaction among singles is associated with lower levels of relationship desire.

H2. Over time, an increase in sex frequency among singles is

associated with lower levels of relationship desire.

The logic behind H1 is that singles who obtain sexual access outside of long-term, committed relationships may have reduced incentives to enter into a relationship. H2 tests whether sex frequency shows a similar pattern, as frequency may reflect short-term sexual opportunity more directly than long-term pair-bonding motivation. In both cases, the reasoning is that when sexual access is obtainable without commitment, the marginal benefits of entering a relationship may decline (McNulty & Fisher, 2008; Pham, 2017; Wade, 2017; Waite & Joyner, 2001a, 2001b). In turn, individuals are expected to express less interest in finding a partner or entering into a stable, committed relationship.

2. Methods

2.1. Data

This study is based on all fourteen waves of the Pairfam study (Brüderl et al., 2024; Huinink et al., 2011). The Pairfam project began collecting longitudinal data in 2008, yet the 2008/2009 wave does not include data on sex frequency. The Pairfam target population included all German-speaking individuals, irrespective of nationality, living in private households in Germany. A total of 74,969 addresses were collected to ensure a sufficient sample size after cleaning and to facilitate potential replacements for non-responses. From this address pool, a baseline sample of 24,108 addresses was drawn via systematic random sampling. Additional samples were drawn during field time.

In total, a gross sample of 42,074 addresses was contacted using the German language. To increase panel stability, starting with wave 3, respondents who withdrew from the previous wave were recontacted in the subsequent wave. Respondents who did not participate in two subsequent waves were excluded from the panel. In addition, several standardized procedures were enforced to ensure long-time panel stability, including a personalized cover letter and data protection leaflet before the first contact with an interviewer, an incentive of 10 euros (15 since wave 9) after the interview had been completed, and a thank-you card, which was sent to all respondents after the first wave.

A refreshment sample was drawn at the start of wave 11. The goal of the wave 11 refreshment was to increase the sample by 6000 anchor respondents. The resulting refreshment sample was designed to re-establish the original Pairfam design from wave 1. For wave 1, the overall response rate was 37%, with a contact rate of 93% and a cooperation rate of 40%. Thereafter, the panel stability rate hovered around 70%. To maintain transparency and openness, the coding files are available from the author upon request, and the data files are publicly available (Brüderl et al., 2024).

2.2. Participants

The Pairfam sample includes three age cohorts. The present analyses include respondents aged 18–50 who were classified as never-married and single in both the current and immediately preceding survey wave. Single respondents reported no current partnership during the survey reference period.

For sexual satisfaction, the analytical sample includes 7070 observations from 2141 men and 4164 observations from 1458 women. For sex frequency, there are 6554 observations from 1970 men and 4203 from 1435 women. The larger number of individuals than in (Park et al., 2021; $N = 1,282$) reflects the use of all 14 waves, the wave-11 refreshment sample, and different sample and model requirements. While Park et al. used waves 1–10, mixed never-married and divorced, and required at least three single-year reports, the additional waves, refreshment cohort, and different repeated-observation requirement yielded a larger sample despite the present restriction to never-married respondents. Observations were excluded only when respondents were outside the age range, were not never-married singles in both adjacent

waves, lacked a valid outcome or correlator value, or had missing model covariates. Negative survey codes were treated as missing, and no missing values were imputed.

2.3. Measures

The analyses include several socioeconomic and demographic variables based on previous findings (Aysan & Aysan, 2017; K   ts-Ausmees & Realo, 2015; Plouffe & Tremblay, 2017). They include age, years of schooling, subjective health assessment (ranging from 1 – *bad* to 5 – very good), employment, and the number of children, if any. Although political orientation is an important measure in this context (Fieder & Huber, 2024; Vogl & Freese, 2020), no such variables exist in the dataset. Sex is expected to play a significant role in the association between sexual activity and satisfaction and the level of relationship desire as described above (Haavio-Mannila & Kontula, 1997; Laumann et al., 2006; Leal & Castilho, 1998; McNulty & Fisher, 2008; Moret et al., 1998). Thus, the analyses distinguish between men and women.

The dependent variable in this paper is the level of relationship desire, measured using the item “I would like to have a partner,” with agreement ranging from 1 (“not at all”) to 5 (“absolutely”). This item has been drawn from Pairfam’s singlehood module rather than its sexuality items and has been used in prior Pairfam-based studies as an indicator of desire for a partner. Two independent variables are at the focus of this paper. Sexual frequency is based on the number of times respondents reported having intercourse in the three months preceding the survey and is rated on a 0–7 scale ranging from 0 (I have never had sex) to 3 (2–3 times a month) to 7 (daily). Specifically, respondents without a partner were asked, “How often have you had sexual intercourse on average during the past three months?” This is while respondents with a partner were asked, “How often have you had sexual intercourse with your partner on average during the past three months?” The sexual satisfaction variable was measured using a 0 (very dissatisfied) to 10 (very satisfied) scale and stems from the question: “How satisfied are you with your sex life?”

2.4. Analysis

Descriptive statistics for the panel data are presented first. The primary analyses are sex-stratified individual fixed-effects regressions of relationship desire, which focus on within-person variation and absorb time-invariant individual characteristics. Corresponding sex-stratified random-effects models are reported in the appendix, and pooled random-effects models with sex interactions are reported in Table 4.

The primary analyses estimate individual fixed-effects models, which remove all time-invariant person characteristics. Because sex does not vary within individuals in most cases, sex moderation is evaluated in pooled random-effects models. Separate fixed-effects models are also reported for men and women.

Change was calculated only for successive waves. Fixed-effects estimates use the within-person transformation, whereas the moderation models use random-effects GLS (Kaufman, 2013). All estimations were conducted using Stata version 18.1. Because b is an association between prior-wave change and later-wave relationship desire, it should not be treated as a change-on-change or strictly prospective causal effect. This estimand differs from Park et al. (2021), whose within-person term represented deviation from each respondent’s own mean, and from Kislev (2021), who modeled sexual satisfaction and activity as correlators of voluntary singlehood.

3. Results

As the longitudinal design is the focus, Tables 1 and 2 present an overview of the panel data characteristics, with participants separated by sex.

However, the primary purpose of this study is to investigate whether

Table 1

Descriptive statistics: women aged 18 and above.

Variable	Mean	Std. Dev.
Age	26.69	7.95
Subjective health	3.64	1.03
Years of education	12.90	2.56
Employed	0.55	0.50
Number of children, if any	0.21	0.60
Sexual satisfaction	4.90	2.80
Sex frequency	1.57	1.48
Relationship desire	3.25	1.24

Source: Pairfam datasets.

Table 2

Descriptive statistics: men aged 18 and above.

Variable	Mean	Std. Dev.
Age	26.95	7.75
Subjective health	3.78	1.01
Years of education	12.35	2.48
Employed	0.61	0.49
Number of children, if any	0.07	0.36
Sexual satisfaction	4.57	2.76
Sex frequency	1.76	1.53
Relationship desire	3.48	1.13

Source: Pairfam datasets.

changes in sexual satisfaction and sex frequency are associated with relationship desire. For this reason, Table 3 presents individual fixed-effects regressions showing the association of changes in self-reported sexual satisfaction and sex frequency over time on the levels of relationship desire, accounting for social and demographic characteristics.

Changes in sexual satisfaction were negatively associated with relationship desire for men ($b = -0.024$, $p < .001$) and women ($b = -0.026$, $p < .001$). Thus, respondents reported lower relationship desire at observations when sexual satisfaction had increased since the preceding wave. This supports H1 for both sexes. Fig. 1 presents the corresponding descriptive pattern. The x-axis represents change in sexual satisfaction between successive observations; points indicate bin means and error

Table 3

Individual fixed-effects regressions of relationship desire, aged 18 and above.

Variable	Relationship Desire Model 1		Relationship Desire Model 2	
	Men	Women	Men	Women
Age	0.000 (0.004)	−0.012 (0.007)	0.006 (0.005)	−0.001 (0.007)
Subjective health	−0.028* (0.014)	−0.023 (0.020)	−0.028 (0.014)	−0.024 (0.019)
Years of education	0.046*** (0.014)	0.052** (0.017)	0.053*** (0.014)	0.035* (0.016)
Employed	−0.077* (0.033)	0.059 (0.047)	−0.077* (0.033)	0.114* (0.046)
Number of children, if any	0.117 (0.127)	−0.190 (0.141)	0.059 (0.136)	−0.515*** (0.154)
Δ Sexual satisfaction	−0.024*** (0.004)	−0.026*** (0.005)		
Δ Sex frequency			−0.008 (0.008)	0.006 (0.011)
Constant	3.025*** (0.184)	3.052*** (0.243)	2.754*** (0.183)	2.929*** (0.227)
N (observations)	7070	4164	6554	4203
N (individuals)	2141	1458	1970	1435
R ² within	0.012	0.016	0.007	0.010
R ² between	0.012	0.003	0.019	0.010
R ² overall	0.013	0.007	0.017	0.008

Standard errors in parentheses.

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

Source: The Pairfam dataset.

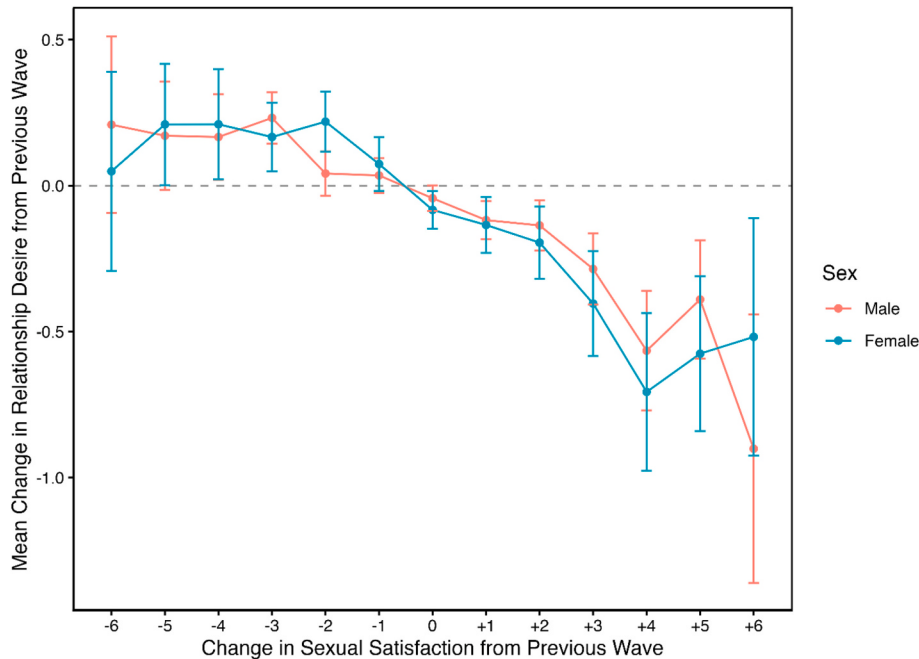


Fig. 1. Descriptive plot, shown separately for men and women, range -6 to $+6$, age 18 and above. Source: The Pairfam dataset.

bars show 95% confidence intervals.

The final two columns of Table 3 show that change in sex frequency was not significantly associated with relationship desire among men ($b = -0.008$, $SE = 0.008$, $p > .05$) or women ($b = 0.006$, $SE = 0.011$, $p > .05$). H2 was therefore not supported: greater intercourse frequency was not reliably associated with lower relationship desire in either sex.

Several covariates were associated with relationship desire. Employment showed different coefficients across the sex-specific models, and the pooled random-effects models indicated lower average relationship desire among women than men. These secondary associations are interpreted cautiously because they are not the primary hypotheses. In addition, Fig. 2 presents an overview of the coefficient plot, divided by sex.

Table 4 presents pooled random-effects moderation models. The correlator labels were aligned with the model-specific sample sizes. For sexual satisfaction (Model 2), the slope for men was negative ($b =$

-0.026 , $p < .001$) and the interaction with sex was not significant ($b = -0.003$, $p > .05$); the corresponding sex-specific fixed-effects estimates were $b = -0.024$ for men and $b = -0.026$ for women, both $p < .001$. For sex frequency (Model 1), the main slope was not significant ($b = -0.012$, $p > .05$) and the interaction was positive ($b = 0.028$, $p < .05$), although neither sex-specific fixed-effects slope was significant. Women reported lower average relationship desire than men in both pooled models ($b = -0.180$ and -0.128 , both $p < .001$).

Taken together, the negative association between change in sexual satisfaction and relationship desire was similar for men and women. Sex frequency showed no consistent association across the sex-specific fixed-effects models, and its pooled interaction should be interpreted as specification-dependent.

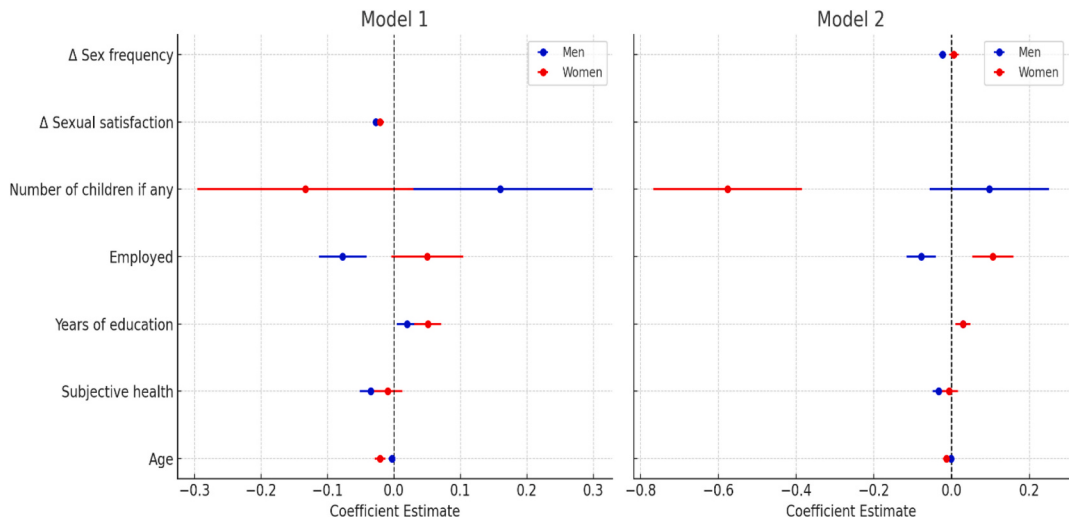


Fig. 2. Coefficient Plot of Fixed-effects regressions of relationship desire, aged 18 and above. Source: The Pairfam dataset.

Table 4

Random-effects moderation regressions of relationship desire, aged 18 and above.

Variable	Relationship Desire	
	Model 1	Model 2
Age	0.015*** (0.002)	0.014*** (0.002)
Subjective health	−0.042*** (0.010)	−0.043*** (0.010)
Years of education	0.031*** (0.006)	0.027*** (0.006)
Employed	0.016 (0.023)	−0.011 (0.023)
Number of children, if any	−0.178*** (0.036)	−0.126*** (0.033)
Sex (women)	−0.180*** (0.035)	−0.128*** (0.035)
Δ Sex frequency	−0.012 (0.008)	
Women × Δ Sex frequency	0.028* (0.012)	
Δ Sexual satisfaction		−0.026*** (0.004)
Women × Δ Sexual satisfaction		−0.003 (0.006)
Constant	2.813*** (0.089)	2.913*** (0.089)
N (observations)	10,757	11,234
N (individuals)	3405	3599
R ² within	0.004	0.009
R ² between	0.045	0.041
R ² overall	0.027	0.032

Standard errors in parentheses.

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

Source: The Pairfam dataset.

4. Discussion

The present study examined whether recent within-person changes in sexual satisfaction and intercourse frequency were associated with relationship desire among never-married singles. Increases in sexual satisfaction were associated with lower relationship desire, whereas changes in intercourse frequency were not significantly associated with relationship desire. By distinguishing changes from the preceding year's observation from whether individuals are above or below their typical level across observations, the present findings test the robustness of previously reported within-person associations under an alternative longitudinal specification and identify a potential boundary condition for the association between intercourse frequency and relationship desire.

The negative association between change in sexual satisfaction and relationship desire converges with prior evidence (Kislev, 2021; Park et al., 2021). Although the observational design does not establish causal direction, sexual satisfaction outside committed relationships may be linked to lower relationship motivation (Pham, 2017; Wade, 2017).

The satisfaction association did not differ significantly by sex. Women nevertheless reported lower average relationship desire than men in the pooled models, consistent with prior Pairfam evidence that women more often describe singlehood as voluntary (Kislev, 2021). One possibility is that this pattern partly reflects sex differences in mate selectivity and the composition of the population that remains single. From an evolutionary perspective, greater average female selectivity in mate choice (Trivers, 1972) could make relationship formation more contingent on the availability of sufficiently desirable partners. Women who remain single may therefore include a relatively larger proportion who prefer remaining single in the absence of suitable opportunities, whereas single men may include a larger proportion who desire a relationship but have not formed one. This interpretation remains

speculative, however, as the present analyses do not identify why individuals remain single or measure mate availability or selectivity. Moreover, this is a between-person difference and should not be interpreted as a within-person effect of sex.

More broadly, sexual satisfaction may provide feedback about whether current sexual arrangements are meeting an individual's needs. Sexual Strategies Theory (Buss & Schmitt, 1993) and Strategic Pluralism Theory (Gangestad & Simpson, 2000) offer one interpretation of this association, but the present observational models do not directly identify an evolved mechanism.

The sex-frequency result differs from earlier findings (Kislev, 2021; Park et al., 2021). Park et al. (2021) reported positive within-person and between-person associations between sexual frequency and desire for a partner. In the present sex-specific fixed-effects models, successive-wave change in intercourse frequency was not significant.

Other studies and theories argue that emotional and physical factors can incentivize entering into committed relationships (Apostolou et al., 2019; Pepping et al., 2018; Twenge et al., 2017). When some of these factors are addressed outside of relationships, singles may be less incentivized to enter into a relationship and may show reduced levels of wanting a partner.

The null sex-specific findings for intercourse frequency suggest that the quantity of intercourse is a less consistent correlate of relationship motivation than satisfaction with one's sex life. Sexual satisfaction is a global evaluation and can remain high with little or no partnered intercourse, including when needs are met through solitary sexual activity. This distinction may help explain why satisfaction and intercourse frequency do not move together.

The discrepancy is best treated as a boundary condition. Kislev (2021) examined voluntary singlehood as a correlator of sexual satisfaction and activity, whereas Park et al. (2021) used a multilevel within-between decomposition. The current analysis instead uses all 14 waves, focuses on never-married singles, and estimates change since the immediately preceding wave. These differences alter the estimand and may account for the non-replication of the frequency association.

The difference from earlier frequency findings may reflect sample composition, the additional waves, or the distinct within-person estimand. It may also reflect reverse direction: people who want a partner may date more actively and thereby have more opportunities for sex. To wit, one possible explanation is that the direction of association between sex frequency and relationship desire may sometimes run from partner-seeking to sexual activity rather than the reverse. People who are actively seeking a partner may also have greater motivation for intimacy and closeness and may turn to one-night stands while remaining single.

A second possible explanation is that the same activities involved in looking for a partner may also increase opportunities for casual sex. While dating potential partners, some encounters may develop into "hookup" dates (Brunell & Webster, 2013; Feingold, 1988; Wade, 2017). In addition, even dates that evolve into more serious courtship may increase sexual frequency as partners assess sexual compatibility (McCabe & Collins, 1984; Willoughby et al., 2014).

Taken together, the findings suggest that sexual satisfaction is more consistently associated with lower relationship desire than is sexual frequency. Thus, while research has shown that many singles are motivated to enter into relationships to obtain and maintain sexual satisfaction (Park et al., 2021; Regan, 2016), this study documents a possible alternative route in which singles find ways to increase their sexual satisfaction outside of a relationship.

4.1. Limitations

The study presented here is not without limitations. First, the data in this study comprise only participants from Germany. Some studies have found geographical and cultural differences that may affect the associations reported herein (e.g., Gaymu et al., 2012). Future studies in this field should include cross-national comparative analyses using data

from countries that differ in their acceptance of and prevalence of living without a partner (Adamczyk & Trepanowski, 2023; Dales & Kottmann, 2023; Zhu et al., 2022).

Second, the nature of the Pairfam data collection means that the longitudinal analysis here includes only individuals who were single in two consecutive time periods and thus excludes those whose relationship status changed. In addition, the dataset may include individuals who were single during both data-collection periods but were in romantic relationships at some point between them. These subgroups warrant future attention, particularly because the association of a change in relationship status is often felt most strongly in the period immediately after the change (Lucas, 2005; Lucas et al., 2003). Future qualitative studies in this area will complement the findings of this study and those of Lahad (2017), who emphasized viewing singlehood as a temporal phenomenon. Yet, because the share of these cases is usually low among the general singles population, the results here are expected to remain valid.

Third, the change ends at one successive wave at which relationship desire is measured. The design therefore establishes within-person change, but not complete temporal precedence over the outcome. The analysis also does not account for time since the previous relationship, duration or quality of prior relationships, or the context of non-committed sexual activity.

Fourth, intercourse frequency does not distinguish the number of partners, relational context, or solitary sexual activity. Sexual satisfaction may incorporate these experiences even when reported intercourse frequency is zero. Future work should measure these components separately.

Finally, the number of children remains a covariate rather than an outcome. The sample includes adults as young as 18 and is not restricted to completed fertility. Testing fertility consequences would require a different prospective design that defines reproductive exposure, subsequent births, censoring, and an appropriate risk set. This is beyond the relationship-motivation estimand of the present study but is an important direction for future work.

4.2. Conclusion

The current study clarifies the conditions under which sexual experiences are associated with relationship desire among singles. In both men and women, increases in sexual satisfaction were associated with lower relationship desire, and this association did not differ reliably by sex. In contrast, changes in intercourse frequency showed no reliable sex-specific fixed-effects association. The study therefore provides convergent evidence for the negative association involving sexual satisfaction while identifying a modeling and sample boundary for conclusions about sexual frequency. These results are consistent with the possibility that satisfying sexual experiences outside long-term pair-bonding coincide with temporarily lower motivation for commitment, but causal and mechanistic claims await designs that directly test temporal ordering and alternative explanations.

Appendix Table A1. Random-effect GLS regressions of relationship desire, aged 18 and above.

Variable	Relationship Desire Model 1		Relationship Desire Model 2	
	Men	Women	Men	Women
Age	0.017*** (0.003)	0.008* (0.004)	0.017*** (0.003)	0.011** (0.004)
Subjective health	−0.041*** (0.012)	−0.045** (0.017)	−0.040** (0.013)	−0.044** (0.017)
Years of education	0.030*** (0.007)	0.022* (0.010)	0.034*** (0.008)	0.025* (0.010)
Employed	−0.064* (0.028)	0.081* (0.039)	−0.057* (0.028)	0.130*** (0.038)

(continued on next column)

(continued)

Variable	Relationship Desire Model 1		Relationship Desire Model 2	
	Men	Women	Men	Women
Number of children, if any	−0.123* (0.050)	−0.109* (0.047)	−0.127* (0.053)	−0.198*** (0.052)
Δ Sexual Satisfaction	−0.026*** (0.004)	−0.029*** (0.005)		
Δ Sex frequency			−0.012 (0.007)	0.017 (0.010)
Constant	2.819*** (0.112)	2.955*** (0.146)	2.751*** (0.113)	2.751*** (0.141)
N (observations)	7070	4164	6554	4203
N (individuals)	2141	1458	1970	1435
R ² within	0.006	0.005	0.011	0.009
R ² between	0.038	0.039	0.029	0.047
R ² overall	0.014	0.029	0.019	0.039

Standard errors in parentheses.

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

Source: The Pairfam dataset.

CRedit authorship contribution statement

Elyakim Kislev: Writing – original draft, Visualization, Supervision, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. F. Sid Dougan: Writing – review & editing, Conceptualization.

Declaration of Competing Interest

The authors have declared no conflict of interest.

References

Adamczyk, K. (2017). Voluntary and involuntary singlehood and young adults' mental health: An investigation of mediating role of romantic loneliness. *Current Psychology*, 36(4), 888–904. <https://doi.org/10.1007/s12144-016-9478-3>

Adamczyk, K., & Trepanowski, R. (2023). *Singlehood in Europe: Rates and factors associated with happiness*. Brill. <https://doi.org/10.14220/9783737015325.21>

Apostolou, M., Papadopoulou, I., & Georgiadou, P. (2019). Are people single by choice? Involuntary singlehood in an evolutionary perspective. *Evolutionary Psychological Science*, 5(1), 98–103. <https://doi.org/10.1007/s40806-018-0169-1>

Aysan, M. F., & Aysan, U. (2017). The effect of employment status on life satisfaction in Europe. In *Empirical studies on economics of innovation, public economics and management* (pp. 335–347). Springer.

Beckmeyer, J. J., & Jamison, T. B. (2023a). Empowering, pragmatic, or disappointing: Appraisals of singlehood during emerging and established adulthood. *Emerging Adulthood*, 11(1), 103–109.

Beckmeyer, J. J., & Jamison, T. B. (2023b). Understanding singlehood as a complex and multifaceted experience: Insights from relationship science. *Journal of Family Theory & Review*, 15(3), 562–577.

Bergström, M., & Brée, S. (2023). Not a single meaning: Definition and evolution of singlehood in France and the United States. *Journal of Family Theory & Review*, 15(3), 465–484. <https://doi.org/10.1111/jftr.12519>

Berntson, M. A., Hoffman, K. L., & Luff, T. L. (2014). College as context: Influences on interpersonal sexual scripts. *Sexuality and Culture*, 18(1), 149–165.

Brüderl, J., Drobnic, S., Hank, K., Neyer, F. J., Walper, S., Wolf, C., ... Wetzel, M. (2024). *The German family panel (pairfam) (ZA5678; version 14.2.0)*. Cologne: GESIS. <https://doi.org/10.4232/pairfam.5678.14.2.0>

Brunell, A. B., & Webster, G. D. (2013). Self-determination and sexual experience in dating relationships. *Personality and Social Psychology Bulletin*, 39(7), 970–987.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100(2), 204–232. <https://doi.org/10.1037/0033-295X.100.2.204>

Buss, D. M., & Schmitt, D. P. (2019). Mate preferences and their behavioral manifestations. *Annual Review of Psychology*, 70, 77–110. <https://doi.org/10.1146/annurev-psych-010418-103408>

Dales, L., & Kottmann, N. (2023). Japanese singles and solo-life. In K. Chowkhani, & C. Wynne (Eds.), *Singular Selves* (pp. 119–137). Routledge India.

Davidson, J. K., Sr., & Hoffman, L. E. (1986). Sexual fantasies and sexual satisfaction: An empirical analysis of erotic thought. *Journal of Sex Research*, 22(2), 184–205.

DePaulo, B. (2015). *How we live now: Redefining home and family in the 21st century*. Simon and Schuster.

DePaulo, B. (2023). Single and flourishing: Transcending the deficit narratives of single life. *Journal of Family Theory & Review*, 15(3), 389–411. <https://doi.org/10.1111/jftr.12525>

- Ermer, A. E., & Keenoy, J. E. (2023). Singlehood during later life: Theoretical considerations for health and social relationships. *Journal of Family Theory & Review*, 15(3), 595–613. <https://doi.org/10.1111/jftr.12524>
- Farrell, J. (2011). The young and the restless? The liberalization of young evangelicals. *Journal for the Scientific Study of Religion*, 50(3), 517–532.
- Feingold, A. (1988). Matching for attractiveness in romantic partners and same-sex friends: A meta-analysis and theoretical critique. *Psychological Bulletin*, 104(2), 226.
- Fieder, M., & Huber, S. (2024). Demography leads to more conservative European societies. *Biodemography and Social Biology*, 69(4), 183–202.
- Fitzpatrick, J. (2023). Voluntary and involuntary singlehood: Salience of concepts from four theories. *Journal of Family Theory & Review*, 15(3), 506–525.
- Frazier, P., Arikian, N., Benson, S., Losoff, A., & Maurer, S. (1996). Desire for marriage and life satisfaction among unmarried heterosexual adults. *Journal of Social and Personal Relationships*, 13(2), 225–239. <https://doi.org/10.1177/0265407596132004>
- Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, 23(4), 573–587. <https://doi.org/10.1017/S0140525X0000337X>
- Gaymu, J., Springer, S., & Stringer, L. (2012). How does living alone or with a partner influence life satisfaction among older men and women in Europe? *Population*, 67(1), 43–69.
- Girme, Y. U., Park, Y., & MacDonald, G. (2023). Coping or thriving? Reviewing intrapersonal, interpersonal, and societal factors associated with well-being in singlehood from a within-group perspective. *Perspectives on Psychological Science*, 18(5), 1097–1120. <https://doi.org/10.1177/17456916221136119>
- Haavio-Mannila, E., & Kontula, O. (1997). Correlates of increased sexual satisfaction. *Archives of Sexual Behavior*, 26(4), 399–419.
- Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., & Feldhaus, M. (2011). Panel analysis of intimate relationships and family dynamics (pairfam): Conceptual framework and design. *Zeitschrift für Familienforschung - Journal of Family Research*, 23(1), 77–101.
- Jakobsson, U., & Hallberg, I. R. (2005). Loneliness, fear, and quality of life among elderly in Sweden. *Aging Clinical and Experimental Research*, 17(6), 494–501.
- Kaufman, R. L. (2013). *Heteroskedasticity in regression: Detection and correction*. Sage Publications.
- Kislev, E. (2019). *Happy singlehood: The rising acceptance and Celebration of solo living*. University of California Press. <https://doi.org/10.2307/j.ctvd1c7r2>
- Kislev, E. (2021). The sexual activity and sexual satisfaction of singles in the second demographic transition. *Sexuality Research & Social Policy*, 18, 726–738.
- Kislev, E. (2022a). Relationship-status and work-life balance satisfaction: Cross-sectional and longitudinal analyses. *Applied Research in Quality of Life*, 18(2), 1115–1142. <https://doi.org/10.1007/s11482-022-10137-w>
- Kislev, E. (2022b). Relationship desire and life satisfaction among never-married and divorced men and women. *Sexual and Relationship Therapy*, 1–13. <https://doi.org/10.1080/14681994.2022.2099538>
- Kislev, E. (2024). Singlehood as an identity. *European Review of Social Psychology*, 35(2), 258–292. <https://doi.org/10.1080/10463283.2023.2241937>
- Kislev, E., & Marsh, K. (2023). Intersectionality in studying and theorizing singlehood. *Journal of Family Theory & Review*, 15(3), 412–427. <https://doi.org/10.1111/jftr.12522>
- Köots-Ausmees, L., & Realo, A. (2015). The association between life satisfaction and self-reported health status in Europe. *European Journal of Personality*, 29(6), 647–657.
- Lahad, K. (2017). *A table for one: A critical reading of singlehood, gender and time*. Manchester University Press.
- Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. University of Chicago Press.
- Laumann, E. O., Paik, A., Glasser, D. B., Kang, J.-H., Wang, T., Levinson, B., ... Gingell, C. (2006). A cross-national study of subjective sexual well-being among older women and men: Findings from the global study of sexual attitudes and behaviors. *Archives of Sexual Behavior*, 35(2), 143–159.
- Leal, O. F., & Castilho, L. L. E. (1998). Reproductive culture and sexuality. *Estudos Feministas*, 6(2), 425–437.
- Lehmann, V., Tuinman, M. A., Braeken, J., Vingerhoets, A. J. J. M., Sanderman, R., & Hagedoorn, M. (2015). Satisfaction with relationship status: Development of a new scale and the role in predicting well-being. *Journal of Happiness Studies*, 16(1), 169–184. <https://doi.org/10.1007/s10902-014-9503-x>
- Lucas, R. E. (2005). Time does not heal all wounds. *Psychological Science*, 16(12), 945–950. <https://doi.org/10.1111/j.1467-9280.2005.01642.x>
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, 84(3), 527–539. <https://doi.org/10.1037/0022-3514.84.3.527>
- MacDonald, G., & Park, Y. (2022). Associations of attachment avoidance and anxiety with life satisfaction, satisfaction with singlehood, and desire for a romantic partner. *Personal Relationships*, 29(1), 163–176.
- McCabe, M. P., & Collins, J. K. (1984). Measurement of depth of desired and experienced sexual involvement at different stages of dating. *Journal of Sex Research*, 20(4), 377–390.
- McNulty, J. K., & Fisher, T. D. (2008). Gender differences in response to sexual expectancies and changes in sexual frequency: A short-term longitudinal study of sexual satisfaction in newly married couples. *Archives of Sexual Behavior*, 37(2), 229–240.
- Ménard, A. D., & Offman, A. (2009). The interrelationships between sexual self-esteem, sexual assertiveness and sexual satisfaction. *The Canadian Journal of Human Sexuality*, 18(1–2), 35–45.
- Moret, L. B., Glaser, B. A., Page, R. C., & Barger, E. F. (1998). Intimacy and sexual satisfaction in unmarried couple relationships: A pilot study. *The Family Journal*, 6(1), 33–39.
- Offman, A., & Matheson, K. (2005). Sexual compatibility and sexual functioning in intimate relationships. *Canadian Journal of Human Sexuality*, 14(1/2), 31–39.
- Park, Y., Impett, E. A., & MacDonald, G. (2021). Singles' sexual satisfaction is associated with more satisfaction with singlehood and less interest in marriage. *Personality and Social Psychology Bulletin*, 47(5), 741–752.
- Pedersen, W., & Blekesaune, M. (2003). Sexual satisfaction in young adulthood: Cohabitation, committed dating or unattached life? *Acta Sociologica*, 46(3), 179–193. <https://doi.org/10.1177/00016993030463001>
- Pepping, C. A., & MacDonald, G. (2019). Adult attachment and long-term singlehood. *Current Opinion in Psychology*, 25, 105–109. <https://doi.org/10.1016/j.copsyc.2018.04.006>
- 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>
- Pham, J. M. (2017). Beyond hookup culture: Current trends in the study of college student sex and where to next. *Sociology Compass*, 11(8), Article e12499.
- Plouffe, R. A., & Tremblay, P. F. (2017). The relationship between income and life satisfaction: Does religiosity play a role? *Personality and Individual Differences*, 109, 67–71.
- Prabhakar, B. (2011). Causes for remaining single: A comparative study. *Journal of Psychosocial Research*, 6(2), 203–210.
- Pujols, Y., Meston, C. M., & Seal, B. N. (2010). The association between sexual satisfaction and body image in women. *The Journal of Sexual Medicine*, 7(2), 905–916.
- Regan, P. C. (2016). *The mating game: A primer on love, sex, and marriage*. Sage Publications.
- Rostovsky, S. S., Dekhtyar, O., Cupp, P. K., & Anderman, E. M. (2008). Sexual self-concept and sexual self-efficacy in adolescents: A possible clue to promoting sexual health? *Journal of Sex Research*, 45(3), 277–286.
- Sharma, A. (2015). Feminism in India-A fractured movement. *History*, 4(2).
- Slonim, G., Gur-Yaish, N., & Katz, R. (2015). By choice or by circumstance? Stereotypes of and feelings about single people. *Studia Psychologica*, 57(1), 35–48. <https://doi.org/10.21909/sp.2015.01.672>
- Slonim, G., & Schütz, A. (2015a). Singles by choice differ from singles by circumstance in their perceptions of the costs and benefits of romantic relationships.
- Slonim, G., & Schütz, A. (2015b). Singles by choice differ from singles by circumstance in their perceptions of the costs and benefits of romantic relationships. In *27th Annual Convention of the Association for Psychological Science*, New York.
- Snell, W. E., Jr., & Papini, D. R. (1989). The sexuality scale: An instrument to measure sexual-esteem, sexual-depression, and sexual-preoccupation. *Journal of Sex Research*, 26(2), 256–263.
- Spielmann, S. S., MacDonald, G., Joel, S., & Impett, E. A. (2016). Longing for ex-partners out of fear of being single. *Journal of Personality*, 84(6), 799–808.
- Sprecher, S. (2002). Sexual satisfaction in premarital relationships: Associations with satisfaction, love, commitment, and stability. *Journal of Sex Research*, 39(3), 190–196.
- Stein, P. (1975). Singlehood: An alternative to marriage. *The Family Coordinator*, 24(4), 489–503. <https://doi.org/10.2307/583033>
- Stephenson, K. R., & Meston, C. M. (2015). The conditional importance of sex: Exploring the association between sexual well-being and life satisfaction. *Journal of Sex & Marital Therapy*, 41(1), 25–38.
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871–1971* (pp. 136–179). Aldine.
- Twenge, J. M., Sherman, R. A., & Wells, B. E. (2017). Declines in sexual frequency among American adults, 1989–2014. *Archives of Sexual Behavior*, 46(8), 2389–2401.
- Vogl, T. S., & Freese, J. (2020). Differential fertility makes society more conservative on family values. *Proceedings of the National Academy of Sciences*, 117(14), 7696–7701.
- Wade, L. (2017). *American hookup: The new culture of sex on campus*. WW Norton & Company.
- Waite, L., & Joyner, K. (2001a). Emotional and physical satisfaction with sex in married, cohabiting, and dating sexual unions: Do men and women differ? In E. O. Laumann, & R. T. Michael (Eds.), *Sex, love, and health in America: Private choices and public policies* (pp. 239–269). University of Chicago Press.
- Waite, L., & Joyner, K. (2001b). Emotional satisfaction and physical pleasure in sexual unions: Time horizon, sexual behavior, and sexual exclusivity. *Journal of Marriage and Family*, 63(1), 247–264.
- Warehime, M. N., & Bass, L. E. (2008). Breaking singles up: Sexual satisfaction among men and women. *International Journal of Sexual Health*, 20(4), 247–261.
- Willoughby, B. J., Carroll, J. S., & Busby, D. M. (2014). Differing relationship outcomes when sex happens before, on, or after first dates. *Journal of Sex Research*, 51(1), 52–61.
- Zheng, L., Zhang, X., & Feng, Y. (2017). The new avenue of online sexual activity in China: The smartphone. *Computers in Human Behavior*, 67, 190–195.
- Zhu, J., Stok, M., Bal, M., & de Wit, J. (2022). Mapping the antecedents, conditions, and consequences of family pressure that drives Chinese queer people into heterosexual marriage: A systematic review. *LGBTQ+ Family: An Interdisciplinary Journal*, 18(4), 339–368.
- Zion-Waldoks, T. (2015). Politics of devoted resistance agency, feminism, and religion among orthodox agunah activists in Israel. *Gender & Society*, 29(1), 73–97.