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## The Sexual Activity and Sexual Satisfaction of Singles in the Second Demographic

### Transition

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### Abstract

**Background:** Previous studies depicted a recent drastic reduction in sexual activity in tandem with the rise of the Second Demographic Transition (SDT). However, very little attention has been paid to the questions of whether and how these processes are connected and how they play out in measuring sexual satisfaction among the diverse population of single people.

**Method:** Therefore, the current research focused on exploring this relation among the groups of never-married singles and divorced singles, further divided into men and women (N = 5944) and compared with married people (N=18,733). Data were drawn from the Panel Analysis of Intimate Relationships and Family Dynamics (Pairfam) study.

**Results:** The results of this study indicated that voluntary singlehood positively correlates with sexual satisfaction among all four groups. Moreover, voluntary singlehood among women of both groups negatively correlates with sex frequency, desired sex frequency, and pornography usage, while among men voluntary singlehood negatively correlates with desired sex frequency.

**Conclusions:** These results indicate that within the second demographic transition, voluntary singles are generally more sexually satisfied, and this is not associated with having more casual sex, but rather with desiring less sex and, among women, with being less sexually active relatively to involuntary single women.

**Keywords:** sexual satisfaction; sexual activity; voluntary singlehood; marriage.

## **Introduction**

The second half of the twentieth century was characterized by reduced fertility rates and a move away from the traditional marital family unit. In particular, the last few decades saw significant rises in the average age of first marriage, increased rates of divorce, higher acceptance of extra-marital sex, and a growing number of individuals who are actively choosing to not get married (Amato, 2010; Klinenberg, 2012; Santos & Weiss, 2016). These changes, known as the Second Demographic Transition (SDT), began after the Second World War and intensified in the 1970s. The net result is a shift from the rapid population growth observed since the industrial revolution towards either population stability or below-replacement fertility. These changes were first evident in several European and Asian nations (Lesthaeghe & Surkyn, 1988) and subsequently in non-Western and developing countries (Ackermann, 2014; Aghajanian & Thompson, 2013; Raymo, Iwasawa, & Bumpass, 2015).

Indeed, the growth in the single, unmarried, and living alone demographics are evident globally. In the United States, 22% of American adults were single in 1950, while the number of adults living without a partner or spouse has jumped to 42% in recent years (Fry, 2017), and one in four American young adults is predicted to never get married (Wang & Parker, 2014). In Europe, more than half of households in major cities such as Munich, Frankfurt, and Paris is occupied by one person (Euromonitor, 2013). In Asia, the more economically developed societies in East Asia such as Japan, South Korea, and Taiwan have the highest proportion of one-person households (Jones, 2012), at 32.4%, 23.9%, and 22%, respectively. These percentages represent a dramatic growth from the corresponding rates in 1980 – 19.8%, 4.8 percent, and 11.8%, respectively. South American, Middle Eastern, and African countries were

quick to follow these trends and have seen a rise in the number of singles over the last few decades (Zaidi & Morgan, 2017).

Given the move away from the traditional marital family unit, it is a valid and crucial pursuit to understand the social mechanisms that facilitate these changes. To that end, it was shown that the rise in SDT is also tied with individualism and post-materialist values, in which people opt for singlehood in order to be freer, experience more things, and be allowed to be creative without being tied down and being burdened with family obligations (Kislev, 2018). However, and despite the increased acceptance of extra-marital sex, the question remains whether being interested in staying single is related to desire for sex, sex frequency, and satisfaction from sex, and whether these potential relationships could be used to improve the understanding of the progress of the SDT.

Therefore, this study examines the sexual satisfaction of the singles demographic, paying particular attention to the difference between voluntary and involuntary singles. The idea that singles can be distinguished according to the extent at which they desire a romantic relationship was initially theorized by Stein (1975) who differentiated between those who would prefer to be in a relationship (involuntary singles), and those who would not (voluntary singles). Indeed, and despite the challenges, stereotypes, and discrimination that singles frequently face, there is little doubt that some people choose to remain single even though they have the option to enter into an intimate relationship (Lehmann et al., 2015).

Many studies have investigated the link between marital and/or cohabitation status with sexual satisfaction (e.g. Carter, Duncan, Stoilova, & Phillips, 2016; Forste & Tanfer, 1996), but none take into account heterogeneity of relationship desirability within the singles demographic. Thus, the question this current study asks is whether voluntary and involuntary types of

singlehood are associated with sexual satisfaction and sexual activity differently. This question is expected to shed light on the components of the SDT.

Finally, it is important to define the terms used in this paper. Offman and Matheson (2005) define sexual satisfaction as the affective response or feedback that informs individuals' rating of their sexual relationship and the extent to which sexual desires are met. Studies show that sexual satisfaction is associated with one's overall feeling of fulfillment in a relationship and improves one's satisfaction in marriage and life in general (Stephenson & Meston, 2015). Sexual activity is usually measured directly by asking participants about how often they have sex with a partner in a certain timeframe (Warehime & Bass, 2008), but it is also measured here through other, more nuanced, variables of desired sex and pornography usage frequency (see: Libman, Takefman, & Brender, 1980; Short, Black, Smith, Wetterneck, & Wells, 2012). Singles are defined here as those who are not in any committed relationship. This includes individuals who have never married, as well as divorced and widowed adults. Individuals who cohabit with another person or are in a living apart together (LAT) arrangement, though unmarried, are not considered to be single for the purposes of this study. Indeed, conflating the definitions of "unmarried" and "single" would likely lead to misleading analyses (Perelli-Harris et al., 2014).

### **Sexual Activity in the Age of the Second Demographic Transition**

In recent years, many studies have documented a general decline in sexual activity (Jean M. Twenge, Sherman, & Wells, 2015; Jean M Twenge, Sherman, & Wells, 2017). For example, Jean M Twenge (2017) finds that Generation Y is on track to have fewer sex partners than members of the two preceding generations. In fact, her numbers show that those who identify as members of Generation Y are two and a half times as likely to be abstinent as Gen Xers in their

early 20s. According to an analysis of the General Social Survey (T. W. Smith, Davern, Michael, Freese, Jeremy, and Morgan, Stephen L., 2019), the percent of 18-29 years old reporting no sex in the past year increased from around 15% in 1990 to 23% in 2018. In addition, the average American adult went from having sex over 60 times a year, twenty years ago, to around 50 times in 2018.

In Japan, an analysis of the National Fertility Survey, carried out by the National Institute of Population and Social Security Research, shows that the overall age-standardized prevalence of sexual inexperience among women aged 18–39 years had increased from 21.7% in 1992 to 24.6% in 2015, while the age-standardized prevalence in those aged 18–39 years among men had increased from 20% in 1992 to 25.8% in 2015 (Ghaznavi et al., 2019).

One of the major reasons given for this decline is the broader phenomena of the SDT, and in particular, the growing number of singles. Kislev (2019a) suggests that singles are less active sexually due to the lack of a permanent partner. In addition, it was shown that this is a decisive correlator of sexual satisfaction. In fact, singles show higher levels of sexual self-esteem and sexual communication skills, but they are less satisfied with their sex lives only due to lower sex frequency compared with individuals who are married, cohabiting, and living apart together (LAT). However, the question remains whether voluntary and involuntary singles feel the same regarding their sex lives.

### **Sexual Satisfaction and Sexual Activity among Two Types of Singles**

This study distinguishes between voluntary and involuntary singles over a scale of whether or not an individual reports wanting to have a partner. While these terms in practice do not necessarily represent dichotomous opposites, voluntary singles are typically characterized by the active choice to remain single or express disinterest in having a partner (of any kind), while

involuntary singles actively would prefer being in a relationship (Adamczyk & Bookwala, 2013; Lahad, 2017; Stein, 1975). Voluntary singles, to that end, are arguably more reflective of the nature of the SDT, insofar as they do not prefer or seek romantic relationships, thus facilitating the associated decreases in marriage and cohabitation. The premise of this study is that voluntary and involuntary singles may differ in sexual behavior according to high and low sexual activity, and high and low sexual satisfaction, as summarized in Table 1.

[Table 1 about here]

Ostensibly, the increased prevalence of voluntary singles may be explained by satisfaction from casual sexual encounters, or by having less desire for sex. In order to test this empirically, the current study compares voluntary and involuntary singles for each of the four possibilities in Table 1.

The first possibility is that voluntary singles are different in that they want to live without a romantic partner for longer periods of time and, therefore, they experience low sexual satisfaction that is associated with low levels of sexual activity. In other words, those who do not want to have a partner are also those who are unable to address their sexual needs regularly, for longer periods of time. This suggestion concurs with the findings of Kislev (2019a) regarding the general single population. As stated, Kislev suggested that the general single population is less sexually active due to the lack of a permanent partner and this is correlated with lower levels of sexual satisfaction. It might well be, then, that voluntary singles are a selected group that is less sexually active and, in turn, experience higher levels of sexual dissatisfaction.

The second possible difference between voluntary and involuntary singles is apparent for individuals with low levels of sexual satisfaction paired with high levels of sexual activity. Voluntary singles here may pursue occasional low quality sex as a substitute for long-term

partnership. Therefore, voluntary singles might experience low sexual satisfaction in association with a low-quality sexual activity. This suggestion is in line with studies showing that marriage and long-term relationships, in general, provide a better eco-system for sexual satisfaction (e.g. Christopher & Sprecher, 2000; Regis, 2013; Stroope, McFarland, & Uecker, 2015; Waite & Joyner, 2001). The argument is that short-lived sexual encounters make singles less motivated to invest in partner-pleasing skills and to build relationship-specific capital, which, in turn, decreases their chances of higher sexual satisfaction overall (Laumann, Gagnon, Michael, & Michaels, 1994; Treas & Giesen, 2000; Waite & Joyner, 2001). By contrast, involuntary singles may experience low sexual satisfaction due to a tendency to avoid sex outside the framework of the relationship that they desire, or external circumstantial or psychological factors (such as negative relationship experiences or past trauma, e.g. Mills & Turnbull, 2004) that reduce the enjoyment from sexual encounters.

The third possibility is that voluntary singles are different in that they experience higher levels of sexual satisfaction in association with lower levels of sexual activity. The logic is that they simply desire less sex, rather than being frustrated by having their desires unfulfilled. In support of this supposition, one can look at the decline in recent rates of sexual desire (e.g. Hakim, 2015; Jean M Twenge, 2017). Following these trends on the macro level, the argument is that this happens on the individual level as well. It is not that voluntary singles experience frustration due to unfulfilled sexual desires or that they look for casual sex. Rather, they give up on sexual activity and romantic relationship altogether. Indeed, some studies show that the degree of sexual activity is not necessarily associated with sexual satisfaction (Laumann et al., 1994; Pedersen & Blekesaune, 2003; Sprecher, 2002). For example, McNulty and Fisher (2008)

found that men and women differ in this regard: higher sexual activity positively correlates with greater sexual satisfaction for men alone.

The fourth possibility is that voluntary singles experience a higher level of sexual satisfaction due to finding an outlet for sexual desires in casual sex (higher levels of sexual activity). Here, the argument is that voluntary singles accept and enjoy casual sex. They look for sex and intimacy, but without committing to one partner and derive higher levels of sexual satisfaction out of it. This suggestion posits voluntary singles as those fitting recent trends documented in surveys and studies of higher levels of premarital and non-marital sex the most (Cherlin, 1992; Liu et al., 2015). For example, a 2015 Gallup survey showed that Americans in 2015 were 16% more likely to approve of having a baby outside of marriage than in 2000, 15% more likely to approve of pre-marital sex, and even more likely to approve of infidelity, increasing from 7 percentage points to 8 percentage points (Newport, 2015). Separately, Jean M. Twenge et al. (2015) show that American Adults in 2000–2012 had more sexual partners, were more likely to have had casual sex, and were more accepting of most non-marital sex than in the 1970s and 1980s. Specifically, they show that the percentage of those who believed premarital sex was “not wrong at all” was 29% in the early 1970s, 42% in the 1980s and 1990s, 49% in the 2000s, and 58% between 2010 and 2012. Indeed, since the mid-1960s, the sexual revolution has allowed sexual practices outside of marriage to be more rewarding, at least in certain cases (Grello, Welsh, & Harper, 2006; Weaver & Herold, 2000). The introduction of the female contraceptive pill, the rise of feminism, and the legalization of abortion in the 1970s all combined to advance more liberal attitudes toward sex (Joyce, Tan, & Zhang, 2013; Waite & Joyner, 2001) and promoted a growing social approval of premarital and extra-marital sexual relations that are growingly considered beneficial (T. W. Smith, 1994; Thornton, 1989). All of



these general trends are hypothesized to fit especially to the voluntary single population that rises in numbers in parallel to these processes. Some argue that there are more people who choose to stay single because they satisfy their sexual needs outside the wedlock (Adamczyk & Bookwala, 2013).

Therefore, the main question this current research raises is whether voluntary and involuntary singles differ in their sexual satisfaction and in what way. In addition, this research asks whether real and desired sexual activity levels as well as pornography usage frequency are different for voluntary singles and how this might play out in associating with their sexual satisfaction levels. Using the Pairfam dataset allows for measuring the levels of sexual satisfaction and sexual activity alongside the degree to which one is a voluntary single and hence to have a deeper understanding of the SDT.

### **Intervening Mechanisms**

Some intervening mechanisms should be considered here in order to estimate the differences between the groups (single/coupled and voluntary/involuntary singles) rigorously. Gender is expected to play a significant role in moderating the association between voluntary singlehood and sexual satisfaction (Gaymu, Springer, & Stringer, 2012; Leopold, 2018). It was shown that men and women not only experience singlehood differently, but also have dissimilar views of sexual satisfaction (Haavio-Mannila & Kontula, 1997; Laumann et al., 2006; Leal & Castilho, 1998; Moret, Glaser, Page, & Barger, 1998). According to McNulty and Fisher (2008), for example, men's sexual satisfaction and women's sexual satisfaction are determined by different sets of variables: while 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 sexual

activity. Other studies show that women in long-term and serious relationships attest to having a higher level of sexual satisfaction than men in long-term relationships (Pedersen & Blekesaune, 2003). Sprecher (2002) shows that the association between sexual satisfaction and relationship quality in non-marriage relationships is stronger for men than for women. There are several plausible explanations for these differences: dissimilar attachment styles (Adamczyk & Bookwala, 2013; Davis et al., 2006), differing tendencies in self-reporting (Colson, Lemaire, Pinton, Hamidi, & Klein, 2006; McClelland, 2011), and divergent social acceptability (Geer & Robertson, 2005).

In addition, general life satisfaction levels should be accounted for. Previous studies show that overall life satisfaction is positively correlated with satisfaction elsewhere in life, including sex (Oattes & Offman, 2007). For example, in trying to establish the extended satisfaction with life scale (ESWLS), Alfonso, Allison, Rader, and Gorman (1996) show a correlation of .46 between sexual satisfaction and general life satisfaction. The argument is that global feeling of well-being radiates into secondary aspects of life and vice versa. This notion is particularly important when comparing voluntary and involuntary singles. Involuntary singles who want to have a long-term relationship but do not find one might report on lower levels of life satisfaction that might affect their rating of their sexual satisfaction.

Furthermore, health is an important correlator when discussing sexual activity. Studies have shown that feeling better, and having an improved mental health and emotional well-being are closely associated with reports on higher levels of sexual activity (Fischer, Træen, & Hald, 2018; Træen et al., 2019).

Finally, Pedersen and Blekesaune (2003) show that sexual satisfaction is associated with age and this variable interacts with committed relationships. For example, they show that time

spent in committed relationships is positively correlated with sexual satisfaction. Casper and Bianchi (2002) argue that unmarried people are often younger and may not yet have a perspective that is informed by their life experience. This, they argue, may explain why singles report being less satisfied with sex.

## **Method**

Data for this study comes from the waves 2 through 9 of the German Research Foundation (DFG)-funded Panel Analysis of Intimate Relationships and Family Dynamics (Pairfam) study, where the variables in the focus of this paper can be found (Brüderl et al., 2018; Huinink et al., 2011). The Pairfam project began collecting a wide range of data on an annual basis for three age cohorts, starting in 2008/2009 with a sample of 12,400 participants; these participants were adolescents, young adults, and people in middle adulthood.

The present study investigates these variables among German adults over the age of 30, close to the mean age at first marriage in Germany (Koptuyug, 2020). Such an age typically signifies a more permanent state of singlehood for those who report on choosing singlehood and a growing internal and external expectation of being married. Thus, the social contexts of being voluntary and involuntary single are contended to diverge around this age and the SDT is apparent (Engelberg, 2016; Kislev, 2019a, 2019b). Indeed, it is conceptually wrong to study younger age groups in examining the antecedents of the SDT, since they were born after the main manifestations of the SDT, and also, being under the average age of marriage, this would require extrapolating their marriage patterns based on older demographics. Nevertheless, the results of this current study were estimated for younger cohorts and they are not strikingly different (these estimations are available upon request).

Note that this study uses repeated measures as separate data points in order to allow for a reliable statistical examination (Poortman & Liefbroer, 2010), meaning that there are more data points than participants in the analyses. In order to offset the wave effect, this study uses hierarchical models where waves are in the higher level.

Two subgroups of singles are examined here, divided into men and women: never-married men, never-married women; divorced/separated men, and divorced/separated women. All four of these groups are currently single, meaning that respondents do not report having a romantic partner with whom they live apart together (LAT). While there is a theoretical of an “in between” category of a less serious relationship that participants do not consider to be LAT, the study relies on the survey data that asks respondents to self-define as single, and as such no distinction is made between singles who may have casual romantic relationships, or no romantic relationships whatsoever. The study assumes, like others (Huinink et al., 2011) that the self-reporting nature of the relevant survey item, is sufficient for comparing single and coupled demographics. To that end, all single groups are compared to married men and women (excluding those who are married but do not live together), as presented in Table 2.

The sample includes: 7,888 married men and 10,845 married women; 2,589 never-married men and 1,704 never-married women; and 539 divorced men and 1,112 divorced women (539 and 1,112). The mean age of the divorced group is 39.01 for men and 38.88 for women, followed by 38.19 and 37.80 years for married men and married women, respectively. The average ages of never-married men and women were 35.81 and 36.36 years, respectively. The Pairfam dataset also includes widowed adults. While studying this demographic is important for understanding the sexual nature of voluntary and involuntary singles, the relatively young age of

this dataset means that the widowed sample size is negligible. Therefore, widowers, though single, were excluded from the analyses presented.

Based on the literature presented above, the analyses of this study used several demographic and socioeconomic variables including gender, age, years of schooling, and subjective health assessment (ranging from 1 – bad, to 5 – very good) following previous studies' findings (Aysan & Aysan, 2017; K o ts-Ausmees & Realo, 2015; Plouffe & Tremblay, 2017). 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?" Alongside sexual satisfaction, life satisfaction was measured using the following question: "All in all, how satisfied are you with your life at the moment?" This item was also rated on a scale ranging from 0 (very dissatisfied) to 10 (very satisfied).

Sexual activity was divided here into three main sexual variables available in the dataset: (1) sex frequency, (2) desired sex frequency, and (3) pornography usage. 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). This variable can be found in waves 2-9. Desired sex frequency was measured using a 1 (much less often) to 5 (much more often) scale and was based on the question: "If it were your choice alone, would you prefer to have sex less often or more often than during the past three months?" This variable can be found in waves 7-9. Pornography usage was based on the number of times respondents reported having watched pornography in the three months preceding the survey and was rated on a 1-6 scale ranging from 1 (once a month or less) to 3 (once a week), to 6 (daily). This variable can be found in waves 8-9.

Two secondary sexual variables are presented in the descriptive statistics section to show that there is no divergence between voluntary and involuntary singles in these terms. The first is sexual communication that is a constructed variable composed of the answers to the following questions: “If I want something different during sex, I say or show it” and “Generally speaking, I can express my sexual needs and desires well,” based on the scale of Plies, Nickel, and Schmidt (1999) ( $r = 0.77$ ;  $p < 0.01$ ). These two items were combined to create a scale ranging from 1 (not at all) to 5 (absolutely) with half point levels. The second is sexual competence, which is a constructed variable composed of the following two items: “I am a very good sex partner” and “In general, I can fulfill the sexual needs and desires of my partner very well.” This item is a new development made by the Pairfam survey team ( $r = 0.71$ ;  $p < 0.01$ ) and was rated similarly to the sexual communication variable.

The variable at the focus of this paper is voluntary singlehood. This variable is represented by the degree to which respondents agree with the following statement: “I would like to have a partner.” This item was reversed to reflect voluntary singlehood and is rated on a scale ranging from 1 (not at all) to 5 (absolutely) and were given to respondents who have not been in a relationship in the last 3 months and who did not experience a termination of the partnership due to death. Another informative indicator presented in the descriptive results is the variable of the degree to which respondents agreed with the following statement: “Being single, I find many things easier because one doesn't constantly need to be considerate or adjust to another person.” This variable was mostly correlated with the variable of voluntary singlehood and respondents rated this item on a similar scale, ranging from 1 (not at all) to 5 (absolutely).

While Tables 2 and 3 present descriptive statistics, Table 4 shows the associations between voluntary singlehood and sexual satisfaction. A separate regression equation was

computed for men and women among never-married and divorced respondents. Table 4 presents a multilevel regression analysis to examine the associations between sexual satisfaction and several other variables, including voluntary singlehood, accounting for waves on a higher level.

Table 5 shows associations of sexual activity with voluntary singlehood in interaction with gender. Again, this analysis was estimated separately for never-married and divorced respondents. Three aspects of sexual activity are estimated in Table 5: sex frequency, desired sex frequency, and pornography usage. All estimations herein were conducted with the Stata software, version 15.1.

## **Results**

### **Descriptive Statistics**

The characteristics of the sample population are presented in Table 2. Regarding sex communication, sex competence, sexual activity, and desired sexual activity, divorced and never-married singles appear to report higher scores than married and cohabiting respondents (this is tested statistically below). Among divorced and single respondents, men typically report higher scores than women, while the opposite is true for never-married and single respondents. Though not the focus of the current study, these statistics would appear consistent with findings of studies showing how stigma negatively affects the sex lives of divorced women in particular (Konstam, Karwin, Curran, Lyons, & Celen-Demirtas, 2016). The overall patterns appear different for sexual satisfaction, where married and cohabiting women and men report higher scores than the single demographics. Analyses later in this paper will shed light on possible reasons for these discrepancies.

[Table 2 about here]

Two variables in the study measure attitudes towards singlehood. Regarding whether singlehood makes things easier, or preferring singlehood (i.e. ‘voluntary singlehood’), women appear to score higher than men, and the divorced score higher than never-married.

### **Descriptive Statistics for Voluntary and Involuntary Singlehood**

While Table 2 presents the overall descriptive statistics of the groups, it does not distinguish between those with different levels of voluntary singlehood. Table 3 presents this division. The statistics in Table 3 show that women chose singlehood at higher rates as compared with men. In addition, as the level of voluntary singlehood increased so did sexual satisfaction. This is the focal point for this current research and is thus illustrated in Figure 1.

[Table 3 about here]

In this figure, an analysis was conducted consisting of a range from absolutely wanting to have a partner to the highest level of disinterest in having a partner (x-axis), while the y-axis shows the level of sexual satisfaction. The outcomes of the analysis depicted a negative correlation between wanting to have a partner and sexual satisfaction. Those who absolutely wanted to have a partner were the least satisfied sexually, while those who displayed the least interest in wanting to have a partner depicted the greatest level of sexual satisfaction in their lives.

[Figure 1 about here]

These outcomes raise the question of whether sexual satisfaction increases in tandem with voluntary singlehood because these singles address their sexual needs elsewhere, outside of partnership. For this reason, Table 3 also shows that with the increase in the levels of voluntary singlehood, desired sex frequency and pornography usage decreased. This is while the actual sex



frequency remained almost unchanged, together with rates of sexual communication and sexual competence. These results will be further examined statistically in the analyses presented below. In particular, given the differences between men and women in the descriptive data, the analyses below examine how gender impacts the nature of these relationships for voluntary and involuntary singlehood.

### **Statistical Analyses of Sexual Satisfaction by Voluntary Singlehood**

In order to estimate the exact association between voluntary singlehood and sexual satisfaction, accounting for other related variables such as age, subjective health, years of education, employment, income satisfaction, and the number of children, a multilevel analysis was conducted, as shown in Table 4. Findings show that subjective health positively correlated with sexual satisfaction among all singles. Among divorced men, age was negatively correlated with sexual satisfaction, while income satisfaction positively correlated with sexual satisfaction. Years of education negatively correlated with sexual satisfaction among never-married men, and among divorced women. Additionally, the number of children negatively correlated with sexual satisfaction among divorced women.

[Table 4 about here]

The primary focus of the current research is to explore the association between sexual satisfaction and voluntary singlehood. Closely reflecting Table 3 and Figure 1, the statistical analysis depicted a positive correlation between voluntary singlehood and sexual satisfaction among all four of the single groups.

## **How Does Sexual Activity Differ for Voluntary Singles?**

In order to enhance the analysis and address the question posited above regarding the reasons for sexual satisfaction among voluntary singles, three aspects of sexual activity were estimated: sex frequency, desired sex frequency, and pornography usage. This time, an interaction term of gender and voluntary singlehood was used in order to account for men and women separately. Again, the statistical analysis in Table 5 distinguishes between never-married and divorced respondents.

Table 5 shows that age of never-married and divorced respondents negatively correlated with sex frequency, while pornography usage negatively correlated with age among the divorced. Subjective health positively correlated with sex frequency among never-married, and divorced respondents. Among the never-married, years of education positively correlated with desired sex frequency and pornography usage among the never-married. For the divorced, such a significant correlation was only evident with desired sex frequency. For the never-married, being employed positively correlated with sex frequency and desired sex frequency. Satisfaction with income positively correlated with sex frequency and negatively correlated with pornography usage among divorced respondents. The number of children positively correlated with sex frequency and negatively correlated with pornography usage among the never-married.

[Table 5 about here]

Most importantly in the context of this study, voluntary singlehood negatively correlated with desired sex frequency among the never-married, and the divorced. Voluntary singlehood also negatively correlated with sex frequency among never-married and divorced women. Lastly, voluntary singlehood negatively correlated with pornography usage among never-married and divorced women.

Important gender differences emerge here: for women across the board, being voluntarily single is associated with lower reported sex frequency, reduced desired sexual frequency, and reduced pornography usage. For men, such a relationship was found only for the never-married regarding consumption of pornography, and for the divorced regarding sex frequency.

## **Discussion and Policy Implications**

This study aimed to distinguish between voluntary and involuntary singles in estimating how the SDT affects sexual satisfaction and sexual activity, based on the detailed data of the Pairfam survey. The descriptive results in tables 2 and 3 and the statistical analyses found in Tables 4 and 5 demonstrate that those who are more voluntarily singles show higher levels of sexual satisfaction. These findings diverge from the overall negative association between singlehood and sexual satisfaction as shown in previous studies (e.g. Kislev, 2019a; Waite & Joyner, 2001). Voluntary singles are a subgroup of singles that demonstrate almost comparable rates of sexual satisfaction relative to married and cohabiting people. Even before testing this statistically, they presented an average of 5.83 points per Table 3 versus 6.15 among married men and 6.39 among married women per Table 2. This is while singles who have no interest in staying single scored 3.38 points on average on the sexual satisfaction scale of 0-10. This seemingly association of voluntary singlehood with sexual satisfaction is confirmed statistically in Table 4.

Regarding demographic and socioeconomic characteristics, many of the results raise questions about sexual satisfaction. For instance, the results show a connection between income and sexual satisfaction, particularly for divorced men. While older studies have found that this is not the case for men in general, this finding could be related to sexual scripts or power-roles, or

even to mechanisms related to commercial sex (Sanders, 2008), and should invite further investigation. In another instance, the results here indicate that having children is associated with reduced sexual satisfaction for divorced women. Since mothers are usually awarded primary custody of children in divorce, this difference could be due to the challenges of maintaining a satisfying sex life while caring for minors (Jean M. Twenge, W. Keith Campbell, & Craig A. Foster, 2003; Jean M Twenge, W Keith Campbell, & Craig A Foster, 2003).

In light of these findings, this study took a step further and examined the sexual behavior patterns of voluntary singles. This is in order to understand the mechanisms behind their higher sexual satisfaction levels. To conceptualize and decipher these mechanisms, this study offered a matrix of low/high sexual activity and low/high sexual satisfaction. The first two, high and low sexual activity with sexual satisfaction, were ruled out by the findings. Indeed, Tables 3 and 4, and Figure 1, show that voluntary singles are significantly more satisfied with their sex lives than involuntary singles.

However, this study also examines the next two possibilities where voluntary singlehood is associated with higher levels of sexual satisfaction. Indeed, the third possibility is that voluntary singles experience a higher level of sexual satisfaction in association with lower levels of sexual activity. In other words, being less sexually active goes hand in hand with less interest in having a partner, but it does not have a negative effect on their sexual satisfaction (e.g. Ghaznavi et al., 2019; YRBSS, 2018). In contrast, the fourth possibility is a higher level of sexual satisfaction compared to involuntary singles in association with a higher sexual activity (Cherlin, 1992; Grello et al., 2006; Liu et al., 2015; T. W. Smith, 1994; Thornton, 1989; Weaver & Herold, 2000). The hypothesis is that voluntary singles accept their situation as such and

engage in more casual sex in order to satiate their sexual needs and derive greater satisfaction from it.

To that end, the results of this study indicate that the third possibility is more dominant among voluntary singles. Table 5 shows that women who saw their singlehood as more voluntary also reported on lower levels of sex frequency and desire for sex as well as expressed less interest in pornography than involuntary single women. This is true for both divorced and never-married women. Among men, most of the variables are insignificant, but the indicators that cross the significance threshold show that both never-married and divorced single men desired less sex when they saw their singlehood as more voluntarily.

These results should not come as a surprise as the SDT folds out. Indeed, it has already established that long-term relationships and marriages are less central in today's society (Kislev, 2019b), and that people on average are less interested sexual activity (e.g. Ghaznavi et al., 2019; Jean M Twenge, 2017; YRBSS, 2018). The current study shows that this also happens on the individual level. Those who more strongly prefer being single are also those who are less interested in sex. In turn, they report on higher levels of sexual satisfaction compared with involuntary singles, possibly because they do not seek sex in high intensity are not frustrated when it is not available to them.

This conclusion touches upon and expands the understating of the SDT and its consequences (Lesthaeghe & Neidert, 2006; Van de Kaa, 1994). The rising prevalence of singlehood as a part of the SDT is has been tied with individualism and post-materialist values (Kislev, 2019b), it is not clear whether those who are more interested in staying single also feel freer to do so, and indeed fulfil these desires through increased sexual activity.

It seems that the current study helps to clarify this question. Indeed, if, as the results suggest, voluntary singles are typically more satisfied with less sexual activity, it is possible to offer additional reasons for the growth of the singles demographic. Since research shows that many singles are motivated to enter relationships in order to obtain and maintain sexual satisfaction (Regan, 2016), the growth of the singles demographic raised questions about how and why an increasing number of people would choose to be single, despite the apparent loss in sexual satisfaction. However, by considering singles as a heterogeneous group, this study offers a possible answer to these questions, by showing that voluntary singles may in fact be satisfied regardless. The apparent sexual satisfaction of voluntary singles can help to partially explain the accelerated manifestation of the SDT, as it removes a reason for which a subgroup of singles – the voluntary singles – would have eventually encouraged relationship formation.

It seems that the convergence of the various social forces that lead to singlehood will only accelerate in the near future. Not only are the proportions changing between married and single people, but the norms and functions of society are also fundamentally shifting to be more inclusive of singles. Given the large number of children expected to never get married (25 percent of US children: Wang & Parker, 2014), and the increasingly high divorce rates (40-50 percent in Europe: Eurostat 2017), it is essential to equip children in the education system with a social and psychological “toolbox” of how to be satisfied singles, sexually and generally.

Recently, world-leading economists such as Amartya Sen and Joseph Stiglitz, major international institutions such as the OECD, and high-profile politicians such as the former French president Nicolas Sarkozy have promoted the idea of measuring policy-making and federal administration according to its effects on people’s happiness (Helliwell, Layard, & Sachs,

2015; O'Donnell, Deaton, Durand, Halpern, & Layard, 2014; Okulicz-Kozaryn, Irani, & Irani, 2016; Stiglitz, Sen, & Fitoussi, 2010).

Given this recent emphasis on happiness, it is necessary to explore what role governments, municipalities, urban planners, and academics can play in raising singles' wellbeing, or even simply allowing the pursuit of it, among singles. Learning about sexuality of voluntary and involuntary singles in schools and supporting high-quality solo lifestyles through the health and welfare ministries, exactly as is done with family life, are essential to our society. Social workers, psychologists, and sex advisors should be trained to serve the singles population.

No doubt, the current study has some limitations which must be highlighted and can be used to facilitate future studies. First, the current research utilized a correlational research methodology, in which the significance and direction of the associations between variables were taken into consideration, but the causality of the association cannot be proven using this methodology. In order to establish causality, experimental studies should be utilized in the future. Second, the sample chosen for this study is drawn from a German survey. Thus, the results also require further research into the nuances that exist between different countries. Third, the Pairfam data does not allow for differentiation between LAT relationships and casual dating, and instead relies on self-reported measures. It is not clear whether this gray zone, wherein voluntary and involuntary singles engage in more casual romantic relationships that are not necessarily LAT, may confound results. Fourth, the data used did not allow for analyses of the widowed population due to a low number of cases. As average life expectancies increase and populations age, studies on the widowed population may give important insights on sexual satisfaction, particularly for elderly adults, in the context of the SDT. Fifth, the dataset did not facilitate the inclusion of sexual orientation in the analyses conducted here, again, due to a low

number of cases. Future studies that investigate the potential mediating role of sexual orientation may provide additional insights. These considerations should be accounted for in future studies and might add to the conclusions herein.



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Table 1. *Matrix of Hypotheses for Voluntary Singles*

		Sexual Activity	
		Low	High
Sexual Satisfaction	Low	Sexually Frustrated	Low Quality Casual Sex
	High	Fine with Singlehood, Low Desire for Sex	Enjoyable Casual Sex

Table 2. *Characteristics of Never-married and Divorced Singles, Men and Women, Age 30 and above*

Variable	Never-married & Single		Divorced & Single		Married & Cohabit	
	Men	Women	Men	Women	Men	Women
N	2,589	1,704	539	1,112	7,888	10,845
Mean age	35.81	36.36	39.01	38.88	38.19	37.80
Subjective health (1-5)	3.53	3.46	3.33	3.37	3.76	3.63
Years of education	13.02	13.52	12.21	12.46	13.71	13.55
% employed	80%	77%	79%	76%	95%	75%
Satisfied with income (1-5)	3.33	3.03	2.69	2.66	3.64	3.63
Mean number of children	0.04	0.47	0.62	1.44	1.68	1.81
Life satisfaction (0-10)	6.56	6.69	6.11	6.56	7.72	7.82
Sexual satisfaction (0-10)	4.01	4.42	4.48	4.65	6.15	6.39
Sex communication (1-5)	3.57	3.61	3.81	3.69	3.46	3.53
Sex competence (1-5)	3.54	3.59	3.71	3.66	3.54	3.42
Sexual activity (0-7)	1.77	1.71	2.29	1.95	3.37	3.37
Desired sexual activity (1-5)	4.19	4.06	4.19	3.94	3.90	3.43
Pornography usage (1-6)	3.37	1.53	2.81	1.71	2.63	1.58
Singlehood makes things easier (1-5)	3.73	3.78	3.65	3.82		
Voluntary singlehood (1-5)	2.38	2.61	2.41	2.87		

Source: Pairfam datasets, waves 2-9, version 9.1.

Table 3. *Sex Characteristics by Degree of Voluntary Singlehood, Age 30 and above*

Degree of voluntary singlehood	% women	Sexual satisfaction	Sexual communication (1-5)	Sexual competence (1-5)	Sex freq. (0-7)	Desired sex freq. (1-5)	Pornography freq. (1-6)
1	43%	3.38	3.68	3.66	1.75	4.36	3.23
2	40%	3.81	3.56	3.60	1.79	4.25	3.08
3	49%	4.53	3.55	3.49	1.82	4.03	2.82
4	54%	5.16	3.65	3.53	1.72	3.83	2.62
5	66%	5.83	3.69	3.56	1.61	3.62	2.43

Source: Pairfam datasets, waves 2-9, version 9.1.

Table 4. *Multilevel analysis of Sexual Satisfaction, Never-married and Divorced, Men and Women*

Variable	Never-married and Single		Divorced and Single	
	Men	Women	Men	Women
Age	-0.019 (0.014)	-0.014 (0.019)	-0.097* (0.039)	-0.028 (0.031)
Subjective health	0.384*** (0.069)	0.179* (0.087)	0.569*** (0.157)	0.564*** (0.117)
Years of education	-0.062* (0.025)	0.015 (0.035)	-0.071 (0.074)	-0.172*** (0.043)
Employed	0.216 (0.174)	-0.143 (0.229)	0.395 (0.422)	0.414 (0.284)
Satisfied with income	-0.081 (0.053)	0.066 (0.071)	0.339** (0.123)	0.087 (0.095)
Number of children if any	-0.029 (0.251)	0.040 (0.124)	0.008 (0.155)	-0.387** (0.135)
Voluntary Singlehood	0.530*** (0.061)	0.636*** (0.074)	0.527*** (0.133)	0.499*** (0.087)
Constant	2.945*** (0.679)	2.307** (0.826)	4.693* (1.851)	4.529*** (1.341)
Variance SD wave	-1.420**	-1.578*	-16.586	-24.982***
Variance SD residual	0.926***	1.001***	0.993***	1.087***
N	1468	966	309	698

\* P < .05 \*\* P < .01 \*\*\* P < .001

Source: Pairfam datasets, waves 2-9, version 9.1.



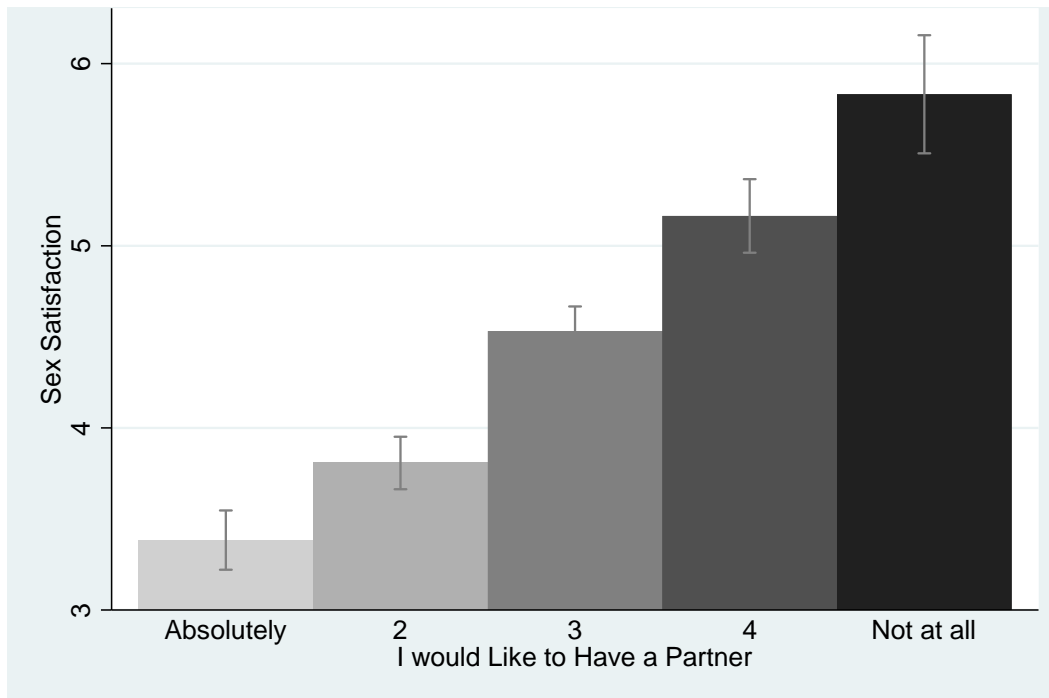
Table 5. *Multilevel analysis of Sexual Activity, Never-married and Divorced, Men and Women*

Variable	Never-married and Single			Divorced and Single		
	Sex Freq.	Desired Sex Freq.	Pornography Usage	Sex Freq.	Desired Sex Freq.	Pornography Usage
Age	-0.044*** (0.005)	-0.037*** (0.011)	-0.001 (0.005)	-0.002 (0.009)	-0.003 (0.016)	-0.063* (0.025)
Subjective health	0.085** (0.026)	0.172*** (0.043)	-0.033 (0.025)	-0.036 (0.042)	-0.082 (0.075)	-0.195 (0.131)
Years of education	-0.008 (0.010)	-0.004 (0.017)	0.042*** (0.009)	0.056*** (0.016)	0.077** (0.025)	-0.086 (0.050)
Employed	0.200** (0.067)	0.029 (0.110)	0.167** (0.065)	-0.034 (0.105)	-0.138 (0.216)	0.444 (0.313)
Satisfied with income	-0.025 (0.021)	0.079* (0.035)	-0.020 (0.020)	0.019 (0.033)	0.077 (0.060)	-0.210* (0.096)
Number of children if any	0.317*** (0.050)	0.065 (0.046)	0.065 (0.055)	-0.035 (0.042)	-0.593** (0.219)	0.037 (0.135)
Voluntary Singlehood*Men	-0.003 (0.025)	0.077 (0.045)	-0.116*** (0.024)	-0.193*** (0.039)	-0.085 (0.065)	0.011 (0.101)
Voluntary Singlehood*Women	-0.066** (0.025)	-0.075* (0.033)	-0.173*** (0.024)	-0.228*** (0.031)	-0.609*** (0.090)	-0.257* (0.113)
Constant	3.017*** (0.254)	2.675*** (0.505)	3.972*** (0.230)	4.090*** (0.444)	2.718*** (0.728)	7.070*** (1.397)
Variance SD wave	-3.222***	-18.418*	-17.735	-27.655*	-25.836	-25.222
Variance SD residual	0.239***	0.266***	-0.252***	-0.262***	0.341***	0.046
N	2375	968	1060	390	385	81

\* P < .05 \*\* P < .01 \*\*\* P < .001

Source: Pairfam datasets, waves 2-9, version 9.1.

Figure 1. *Sexual Satisfaction over Voluntary Singlehood*



95% confidence intervals

Source: Pairfam datasets, waves 2-9, version 9.1.