

ORIGINAL ARTICLE

Open Access



# Sexual intimacy and relationship happiness in living apart together, cohabiting, and married relationships: evidence from Britain

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## Abstract

Research on relationship happiness have traditionally compared cohabiting and married relationships. Studies including LAT relationships are scarce and have disregarded sexual aspects of the relationships. This paper compares how married, cohabiting, and LAT relationships in Britain differ with respect to sexual intimacy (defined as emotional closeness during sex, compatibility in terms of sexual preferences, and interest in having sex with a partner), and relationship happiness. Rich data from the British National Study of Sexual Attitudes and Lifestyles (NATSAL-3, 2010–2012) are used to estimate ordered logistic regression models. Cohabiting individuals share the same levels of sexual intimacy as those married, but they are less happy in their relationship than those married. LAT individuals enjoy overall greater sexual intimacy than coresidential individuals but they are less happy in their relationships. Women in LAT relationships feel less often emotionally close to their partner during sex than married women. By knitting the sex research with the demographic literature, this paper offers new insights in understanding the nature of partnerships, opening up new venues for future research.

**Keywords:** Relationship happiness, Sexual intimacy, Cohabitation, Marriage, Living-apart together relationships

## Introduction

Sexuality is woven into the formation and maintenance of many close romantic relationships, and the literature suggests that sex generally strengthens the bonds of relationships (Debrot et al., 2017; Schwartz et al., 2013). Various dimensions of sexuality, such as sexual frequency or sexual satisfaction, are related to relationship satisfaction and stability (Muise et al., 2016). Aspects such as emotional closeness during sex, compatibility between partners in terms of sexual interest, and preferences are considered central in defining a fulfilling sex life (Mitchell et al., 2011), yet they have received limited attention in previous research. Emotional closeness during sex is related to the feelings of bond, love, and security between partners during the sexual act; compatibility in sexual preferences refers to different sexual activities, such as oral, anal, vaginal sex, or engaging in verbal fantasies, to name a few, that partners want to practice together; compatibility in sexual interest refers to partners

wanting to have sex at a similar frequency (Mitchell & Wellings, 2013; Mitchell et al., 2011). These aspects are important, because they reflect different facets of both sexual difficulties (Witting et al., 2008), and relationship quality (Štulhofer et al., 2013; Yoo et al., 2014). The lack of feelings of closeness, and sexual incompatibility could impact partnership stability (Lodge & Umberson, 2012). In addition, they might differ by partnership type.

Sex research and demographic literatures have begun to look closely at partnerships but have focused mostly on sexual frequency (Schröder & Schmiedeberg, 2015; Yabiku & Gager, 2009) or sexual satisfaction (Laumann et al., 2006; Schmiedeberg & Schröder, 2016). This paper represents the first attempt to bring together these literatures to understand how different dimensions of sexuality are related to partnerships. For conciseness, I adopt the term sexual intimacy in partnerships to refer to emotional closeness with a partner during sex, compatibility between partners in sexual interest, and in sexual preferences. This work focuses on sexual intimacy and relationship happiness as pieces in the puzzle of understanding differences across partnership types.

Cohabiting couples enjoy a higher frequency of sex, being characterised as a “sexier” living arrangement (Blumstein & Schwartz, 1983). Moreover, low sexual frequency has a stronger influence on relationship dissolution for cohabiting than for married couples (Yabiku & Gager, 2009). However, these studies are based on old data capturing a time when cohabitation was a premarital, not a long-term arrangement. More recent studies conducted in Germany, show that being in a cohabiting or married relationship is not associated with changes in sexual frequency and sexual satisfaction over time (Schmiedeberg & Schröder, 2016; Schröder & Schmiedeberg, 2015). In Britain, married women are more likely than cohabiting women to report difficulty with sex or lack of respect/appreciation as reasons for their partnership ending (Gravningen et al., 2017). However, it is still not clear how other aspects of sexual life are related to partnerships, especially in other contexts than the US or Germany.

Studies which compared relationship happiness<sup>1</sup> across marriage and cohabitation were mostly conducted in the US (Brown, 2004; Lee & Ono, 2012; Musick & Bumpass, 2012), where cohabitation is of shorter duration than in the UK (Cherlin, 2009). Comparison studies including LAT<sup>2</sup> relationships are scarce (Lewin, 2017; Tai et al., 2014), and have not considered any sexual aspects of the relationships. Since the definitions of “commitment” and “partnerships” are continuously changing and being redefined by both researchers and couples themselves (Berrington et al., 2015; Perelli-Harris et al., 2014), and given the premarital sex-permissiveness increase in Britain (Mercer et al., 2013), there is a gap and need for understanding how sexual intimacy differs across different intimate partnerships. This paper fills in this gap, shedding light on how relationship happiness and sexual intimacy compares in three types of partnerships: married, cohabiting, and LAT.

## Comparing marriage and cohabitation

### Sexual intimacy

Cohabiting couples may share similar levels of sexual intimacy as married couples, especially in societies, where cohabitation is more prevalent and accepted. The diffusion

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<sup>1</sup> Relationship happiness is sometimes used interchangeably with relationship satisfaction.

<sup>2</sup> LAT is generally used to refer to unmarried non-coresidential couples who identify themselves as being in a steady relationship (Haskey and Lewis, 2006).

theory posits that the selection of cohabitation declines as it becomes more socially accepted and practiced (Liefbroer & Dourleijn, 2006). Some studies have shown that the benefits of cohabitation are similar to marriage with regard to self-rated health (Perelli-Harris et al., 2018), and psychological well-being (Musick & Bumpass, 2012). Cohabiting partners share similar economic (Eickmeyer et al., 2019) and social resources as married partners (Musick & Bumpass, 2012): they are as likely as those married to pool their incomes, and the amount of interaction with friends and family does not differ in married and cohabiting relationships. In the UK, cohabitation is highly prevalent (Beaujouan & Ní Bhrolcháin, 2011), being also an accepted form of parenting (Carter & Duncan, 2018). Studies conducted in Britain show that marriage and cohabitation are perceived as being similar relationship types, and cohabiting couples see themselves as committed as married couples (Carter & Duncan, 2018). Moreover, similar to those married, cohabiting partners share one household and may have interlinked daily schedules.

### **Relationship happiness**

Despite similarities between marriage and cohabitation, a large body of research has underlined that cohabitators often differ from married couples. For example, in Britain, marriage is still perceived as conveying a greater expectation of permanency and a higher commitment than cohabitation (Berrington et al., 2015). A wedding is seen as a sign of public commitment not shown by cohabitation (Berrington et al., 2015). Moreover, married partners benefit from legal rights regarding inheritance, housing, and rights to the matrimonial home, financial support, and pension schemes, whereas those cohabiting or in LAT relationships do not enjoy most of these rights (Duncan et al., 2012). In effect, cohabiting couples are offered little access to family courts in case of separation and neither do they have rights of inheritance after the death of a partner (Barlow, 2014). Given the higher commitment and legal safety of marriage over cohabitation, it might be that those married will be happier with their relationship than those cohabiting. However, a recent study conducted in the UK shows no differences in life satisfaction between marriage and cohabitation, particularly for men (Perelli-Harris et al., 2019). Given these conflicting results, the current research does not provide a definitive direction for a specific hypothesis to be formulated on the differences in relationship happiness between marriage and cohabitation.

### **Comparing LAT with marriage and cohabitation**

#### **Sexual intimacy**

Quantitative and qualitative studies in Britain underline that sexual fidelity is an important characteristic of LAT relationships, being the central element in defining commitment (Carter & Duncan, 2018; Carter et al., 2016). This might be, because LAT partners lack the combined social, and economic resources characteristic of married and cohabiting relationships (Eickmeyer et al., 2019). Moreover, pooling incomes to pay a mortgage, raising children together, sharing finances to pay household bills are important structural investments in coresidential relationships that are usually avoided in LAT relationships (Carter et al., 2016). Some LATs define their relationships in terms of mutual support and affection, expressing willingness to have a long-term partnership and to solve any

difficulties (Kobayashi et al., 2017). Consequently, sex might be considered an important (and perhaps the only) resource (and investment) for LAT partners.

At the same time, sex might not universally be a very important aspect of defining LAT relationships. The narratives of Roseneil's (2006) interviewees suggested that a sexual partner is less important to have a secure and happy life than friends are, the author arguing that LATs de-prioritise sexual/love relationships in favour of friendships. Moreover, living apart is a way of keeping an emotional distance from a partner and control over one's life, especially if the other partner has a very different lifestyle or their own children (Carter & Duncan, 2018). Furthermore, some individuals have admitted that being in a LAT relationship requires less commitment and lacks a certain amount of emotional and sexual intimacy as compared to being in a cohabiting or married relationship (Carter et al., 2016). Hence, it might be that LAT couples will enjoy less sexual intimacy compared to coresidential couples.

### **Relationship happiness**

Studies have found that, overall, LATs enjoy lower levels of relationship satisfaction compared to married or cohabiting couples (Lewin, 2017; Tai et al., 2014). For example, in the US, LATs were less happy than those married, but they did not differ from cohabitators (Lewin, 2017). Moreover, LATs receive less support from their partner (defined as the amount of talking to a partner about one's worries, and of relying on a partner in times of need) than both married and cohabiting respondents (Lewin, 2017). In Britain, LATs do not have any legal rights compared to those married or cohabiting, despite some of them wanting legal protection similar to marriage in terms of inheritance, and child maintenance upon divorce (Duncan et al., 2012). The lack of legal protection may foster a parallel lack of sense of security for some LATs, which would, in turn, affect relationship happiness.

However, it should be noted that LAT, cohabiting, and married relationships can reflect different stages in the life-course. Moreover, LAT and cohabiting relationships can be stages on the way to marriage. Therefore, sexual intimacy and relationship happiness are expected to change throughout the life-course.

### **Gender, sexual intimacy and relationship happiness**

The sexual behaviour of men and women differ, mainly explained by cultural ideas that women are more supportive, emotional, and reactive, while men are less emotional, more independent, and proactive, which shape gendered behavioural norms (Ganong & Larson, 2011). Women "romanticise" the experience of sex by placing importance on being in a committed relationship (Regan & Berscheid, 1999, p. 75), equating sex with expressing emotions, and love to a partner (Mitchell & Wellings, 2013; Umberson et al., 2015). For women, the aim of the sexual act is pair-bonding (Hughes & Kruger, 2011), while men describe sex as being more a need, with no emphasis on feelings (Gabb & Fink, 2015). Therefore, for women, the best context for satisfying sex is a long-term, monogamous relationship, because they feel safer, more comfortable, familiar, and emotionally connected with their partner as compared to how they feel in casual sexual (or less committed) relationships (Armstrong et al., 2012; Peplau, 2003).

Given that men's and women's experiences of emotions and sexual intimacy are different, the analysis will be conducted separately for women and men. Two general hypotheses on the link between men's and women's partnership type and sexual intimacy are formulated in this paper;

**Hypothesis 1:** Given the greater sensitivity of women's sexuality compared to that of men, sexual intimacy will differ by women's partnership type.

**Hypothesis 2:** Among men, sexual intimacy is not expected to differ between those in married, cohabiting, and LAT relationships.

Research on gender differences in relationship happiness comparing those married and cohabiting offer mixed findings. Married men report higher levels of relationship satisfaction than cohabiting men, in the US and Europe (US: Brown & Kawamura, 2010; Europe: Stavrova et al., 2012). The link between relationship type and relationship satisfaction does not differ for women in the US, but in Europe married women are happier in their relationship than cohabiting women. In the UK, Perelli-Harris and colleagues (2019) found that married women are happier than those cohabiting but no differences were found for men. Given the contradicting findings, no hypotheses are formulated with respect to how relationship happiness differs among men and women in married, cohabiting, and LAT relationships.

## Methods

### Sample

The 2010–2012 National Study of Sexual Attitudes and Lifestyles (Natsal-3) data are used for this study. Natsal-3 is a cross-sectional nationally representative survey carried out on 15,162 residents in Britain, aged 16–74 years with the aim to study people's sexual and reproductive behaviours (NatCen Social Research, 2019). A multistage, clustered and stratified probability sample design was used and participants were interviewed in their homes.<sup>3</sup>

Natsal-3 applies specific filters to capture a subsample of sexually active individuals eligible to respond to items about sexual intimacy and relationship happiness. Natsal-3 restricts the sample to people whose last sexual act with any of their last 3 sexual partners was in a "living together/married" or "steady" sexual relationship, and whose relationship is ongoing (Natsal-3 defines an "ongoing relationship" if the respondents are willing to have sex with that partner again). Natsal-3 restrictions include people not sexually active in the past year (20%), unknown number of partners in the past year (3.3%), not willing to have sex again with the sexual partner (4.9%), married, cohabiting and LAT sexual partners in a relationship less than 1 year (4.7%), casual relationships ongoing (2%). This implies that Natsal-3 does not ask the questions about sexual intimacy and relationship happiness to 34.9% of the sample.

I excluded another 21.8% of the sample as it follows: 17% of individuals who declared two or more sexual partners in the last year before the interview to be able to identify the respondents who have sex only with their married or cohabiting partner, focusing on "most recent" sexual relationships. Among monogamous and sexually

<sup>3</sup> After weighting to adjust for unequal probabilities of selection and to match the British population in terms of age, gender, and geographical region, the Natsal-3 sample was broadly representative of the population living in Britain as described by the 2011 Census (Erens et al., 2013).

active respondents in the past year who could have been in the analytical sample, I excluded those in a same-sex relationship (0.6%), as on the one hand, their number is too small to be included in a distinct category or in a separate analysis (91 individuals in the total sample) and, on the other hand, the sexual and relationship behaviours, and sexual evaluations among LGBT population are likely to differ from those of heterosexuals (Green, 2012). Furthermore, respondents with missing data related to the start of the relationship (0.9%), and other data inconsistencies related to either being sexually active in the past year (3.2%), coresidential respondents having sex outside of their relationship or respondents without a clear coresidential relationship status (0.1%) are also excluded from analysis. All these decisions reduced the sample size to 6572 cases (3985 women and 2587 men; for more details about sample exclusion, see Additional file 1: Table S2). LATs are identified in Natsal-3 as “steady sexual” relationships, where individuals had been together for at least 1 year and the relationship is ongoing.

### Dependent variables

As the analysis is run separately by gender, I collapsed those response categories less than 5%, according to statistical guidelines (Armingier, 1995). Moreover, having a bigger cell size within each response category allows to test for model assumptions<sup>4</sup>.

Emotional closeness during sex is measured as “I feel emotionally close to my partner when we have sex together” on a 5-point Likert scale, from 1 “always” to 5 “hardly ever”. The response categories 3 (“sometimes”), 4 (“not very often”), and 5 (“hardly ever”) are collapsed into “not often”. The recoded outcome has the following response categories: 1 “Not often”, 2 “Most of the times”, and 3 “Always”.

Compatibility in sexual interest is measured as “My partner and I share about the same level of interest when having sex” on a 5-point Likert scale, where 1 means “agree strongly”, and 5 “disagree strongly”. The same scale is used for measuring compatibility in sexual preferences, which is measured with the item “My partner and I share the same sexual likes and dislikes”. The response categories 4 (“disagree”), and 5 (“strongly disagree”) are collapsed into “generally disagree”, for both outcomes. These outcomes have the response categories: 1 “Generally Disagree”, 2 “Disagree”, 3 “Agree”, and 4 “Agree strongly”.

Finally, the fourth-dependent variable measures overall relationship happiness with a partner on a 7-point Likert response scale (where 1 means “Very happy”, and 7 “Very unhappy”). This scale is reversed so that higher scores correspond to higher levels of relationship happiness. As the only response category with answers below 5% is for the score of four (“4”) for those in LAT and married relationships, relationship happiness variable is not recoded as this response category does not have an explicit meaning, being rather an ordered score from the scale.

The highest correlation among these four indicators,  $r = 0.51$ , was between compatibility in sexual preferences and compatibility in sexual interest, and most intercorrelations varied around 0.30 suggesting they are measuring different aspects of a couple’s relationship.

<sup>4</sup> The model assumptions are tested based on unweighted data as the weights for complex survey design do not allow to check for regular model assumptions (parallel line assumptions using Brant test).

### Independent variables

**The main independent variable** is *partnership type*, which refers to married, cohabiting, and LAT couples, derived according to respondents' sexual past. The analytical sample includes heterosexual respondents whose last sexual act was in a 'living in/married' or "steady" relationship. Using the sexual relationship status, the legal, and mixed de-facto partnership status respondents are classified into<sup>5</sup> a) married; b) cohabiting, and c) LAT.

In the analysis, factors that may explain sexual intimacy and relationship happiness, and may also reflect selection into different types of relationships, such as *age* and *education* (Kalmijn, 2013), were controlled for. Age is generally associated with decreased sexual frequencies, and sexual desire (Kontula & Haavio-Mannila, 2009; Waite & Das, 2010). Nonetheless, even if it is less frequent, sex is still practiced and enjoyed at older ages (Gott & Hinchliff, 2003), as people reinvent their sexual life when adult children leave the parental home (Forbes et al., 2017). Age is categorised in groups: 16–29, 30–39, 40–49, 50–59, and 60+ years, each one broadly representing peoples' life stages. The first age group<sup>6</sup> is larger than the others, because few individuals are married, and have children at young ages. It roughly captures adolescence, and the "emerging adulthood" period of life (Arnett, 2000). Those aged 30–39 could be generally viewed as young adults. In the UK, Stone et al. (2014) defined individuals between 16 and 34 years as "young adults" arguing that transitions to adulthood are being postponed to later ages. The age groups of 40–49 and 50–59 broadly represent those in mid-life. The last age group represents older adults who are at a life-stage when they generally experience the empty nest and become grandparents. The respondent's *educational attainment* measures the highest academic qualification the respondent holds.

Studies warn that relationship duration is negatively associated with sexual frequency (Klusmann, 2002), sexual satisfaction (Schröder & Schmiedeberg, 2015), and relationship happiness (Brown et al., 2017). In the paper, *relationship duration* measures the time in years, since the respondent began their current sexual relationship.<sup>7</sup> *Having children* negatively affects both sexual and relationship satisfaction (Umberson et al., 2010). In this work, *the number of children* is a categorical variable, with the largest category having 3 or more children.

Poor *physical health* negatively affects a person's interest in having sex (Graham et al., 2017), and relationship happiness (Galinsky & Waite, 2014). In this paper, the *respondent's health* is a dummy variable indicating if, in the last year, the respondent has had any health condition or disability which affected his/her sexual activity or enjoyment in any way. Social psychologists argue that previous sexual experiences impact how people evaluate their present relationship (Kelly & Thibaut, 1978). Having had *multiple sexual partners* before marriage decreases marital quality, for women (Rhoades & Stanley, 2014) and sexual satisfaction for men (Heiman et al., 2011). In this study, *the number of*

<sup>5</sup> A small number of inconsistencies (18 married individuals whose last sexual act was with a "steady" sexual partner and 1 respondent without coresidential status whose last sexual act was with a "living in/married" partner) are not included as it is difficult to ascertain their circumstances.(see Additional file 1: Table S2).

<sup>6</sup> This age group might be heterogenous in experiences of sexual intimacy and relationship happiness; as a sensitivity analysis I omitted those younger than 20 years old but results did not change very much, therefore I kept in the adolescents to have a bigger sample size (results not shown, available upon request).

<sup>7</sup> Natsal-3 measures the relationship duration as month and year of first sex with respondents' most recent sex partner.

*heterosexual and homosexual partners* the respondent ever had is a categorical variable, topped up at more than five lifetime sex partners. Having experienced *sexual abuse* is related to behavioural and mental health outcomes (Jones et al., 2015) and may affect sexual intimacy and relationship happiness as well. In this work, respondents' *experiences of sex against their will* are measured by a dummy variable (yes/no).

### Analytical strategy

Descriptive analyses are undertaken to examine how sexual intimacy and relationship happiness vary by partnership type and gender. Subsequently, a proportional odds model (POM) was used to analyse the data. Because the outcome variables are measured on Likert ordinal response scales, the POM is the most suitable type of regression analysis. Analyses were carried out using STATA statistical software (version 14.0 MP).

One POM is estimated for all four outcome variables, where the effects of predictors are allowed to differ by gender. The multivariate model includes partnership type as the key independent variable controlling for age, partnership characteristics (relationship duration, parenthood status), respondents' health and disability status affecting sexual life and enjoyment in the last year, number of sex partners, attempts of sex without respondents' will, and level of education.<sup>8</sup>

As none of the independent variables have more than 1% of missing cases, the missing data are treated in a listwise deletion fashion. Brant test were used to test for the parallel line assumptions specific to proportional odds models (Brant, 1990; Williams, 2016). Since the Brant test indicated model violation for all the outcomes for females, and for relationship happiness for males, multinomial models were estimated as robustness checks. In general, the size, the significance, and the direction of the coefficients from the main independent variable did not vary to a great extent in any of the models (results not shown, available upon request of author). Another series of analyses were run with relationship duration grouped to account for possible nonlinear relationships between partnership duration and each outcome. There are no major differences between the models with relationship duration grouped and linear, and this suggests the tendency to evaluate more negatively the sexual intimacy aspects as relationships unfold (results not shown, available upon request of author). All these analyses reassure the reader that the POM using the complex survey design weights are the best models to answer to this paper's research questions.

## Results

### Descriptive results

The distribution of the dependent variables by partnership type and gender, and the estimated probability values of the design-based Rao–Scott F statistic (Rao & Scott, 1984), are summarised in Tables 1 and 2.

The majority of marrieds, cohabitators, and LATs declare they “always” feel emotionally close to their partner when having sex. LATs share higher compatibility in sexual

<sup>8</sup> A more complex analytical strategy tested the robustness of those associations between the main independent variable (partnership type) and the outcomes but it did not show relevant differences in results compared with the simpler models shown in the paper.



**Table 1** Distribution of dependent variables by partnership type; Natsal-3 (2010–2012)

Emotional closeness (%)	Marrieds	Cohabitors	LATs	<i>p</i> value (Chi-square test)
Not often	8.7	9.0	9.6	0.228
Most of the time	31.0	30.5	26.2	
Always	59.8	60.4	63.9	
Not answered	0.4	0.2	0.3	
<b>Compatibility in sexual interest (%)</b>				
Generally disagree	26.9	26.2	16.3	0.000
Neither agree or disagree	15.5	13.5	9.1	
Agree	38.2	37.3	40.6	
Agree strongly	19.1	22.8	33.7	
Not answered	0.4	0.2	0.3	
<b>Compatibility in sexual preferences (%)</b>				
Generally disagree	8.5	8.2	6.5	0.000
Neither agree or disagree	14.2	11.9	11.0	
Agree	53.3	53.0	48.5	
Agree strongly	23.7	26.7	33.6	
Not answered	0.4	0.2	0.3	
<b>Relationship happiness (%)</b>				
1. Very unhappy	8.2	6.1	7.3	0.000
2	7.2	9.5	7.7	
3	6.3	7.7	10.7	
4	3.0	4.7	5.6	
5	8.3	8.6	10.4	
6	19.7	22.9	20.8	
7. Very happy	46.8	40.4	37.2	
Not answered	0.3	0.2	0.3	
<i>N</i> (unweighted)	3386	1352	1384	6572
Total %	100	100	100	100

Natsal-3; own computations, weighted results; the Chi-square tests of independence (with Rao–Scott correction) suggest that there is a significant relationship between gender and the indicators for compatibility in sexual interest, and preferences, and relationship happiness at  $p < 0.001$

interest and sexual preferences with their partner compared to marrieds or cohabiters. The largest proportions of married, cohabiting, and LAT individuals are the happiest (score 7—very happy) with their relationship.

The distributions of dependent variables by gender are presented in Table 2. Most males and females report feeling “always” emotionally close to their partners when having sex. However, more females than males declare they do “not often” feel emotionally close to their partners. The largest proportion of men and women agree being compatible with their partner in terms of sexual interest and preferences, and are the happiest with their relationship.

**Table 2** Distribution of dependent variables by gender

Emotional closeness (%)	Female	Male	p value (Chi-square test)
Not often	10.1	7.6	0.000
Most of the time	31.9	28.7	
Always	57.6	63.3	
Not answered	0.4	0.3	
<b>Compatibility in sexual interest (%)</b>			0.021
Generally disagree	27.2	23.6	
Neither agree or disagree	13.2	15.5	
Agree	37.3	39.3	
Agree strongly	21.9	21.3	
Not answered	0.3	0.3	
<b>Compatibility in sexual preferences (%)</b>			0.000
Generally disagree	7.1	9.3	
Neither agree or disagree	11.5	15.3	
Agree	53.2	52.0	
Agree strongly	27.8	23.0	
Not answered	0.4	0.3	
<b>Relationship happiness (%)</b>			0.001
1. Very unhappy	8.8	6.7	
2	8.1	7.2	
3	7.9	6.3	
4	3.9	3.3	
5	8.5	8.8	
6	18.4	22.4	
7. Very happy	44.0	45.0	
Not answered	0.4	0.3	
N (unweighted)	3985	2587	
Total %	100	100	

Natsal-3, own computations, weighted results; the Chi-square tests of independence (with Rao–Scott correction) suggest that there is a significant relationship between gender and the all key indicators, at  $p < 0.05$

### Multivariate regression findings

The differences in sexual intimacy and relationship happiness between those in LAT and cohabiting relationships relative to those married are shown in Table 3 (females) and Table 4 (males), and LAT and married relationships are compared to those cohabiting in Additional file 1: Table S1. This section presents the results on all partnership types comparisons. The results are presented in proportional odds ratios. Following the suggestion of Agresti (2007, p. 185) and for ease of interpretation, a cumulative odds ratio greater than 1 is interpreted as a tendency towards higher values on the ordinal scale, while a cumulative odds ratio lower than 1 as a tendency towards lower values on the scale.

Model 1 in Tables 3 and 4 investigates the association between partnership type and emotional closeness to a partner during sex, which is significant for females but not for males. Females in LAT relationships tend to report lower emotional closeness to their partners as compared to those married; the odds of being in a higher rather than in a

**Table 3** Proportional odds regression models for emotional closeness, compatibility in sexual interest, sexual preferences, and relationship happiness for females

Proportional odds model (POM)								
Variables	Emotional closeness		Compatibility in sexual interest		Compatibility in sexual preferences		Relationship Happiness	
	Model 1	p value	Model 2	p value	Model 3	p value	Model 4	p value
Partnership type (ref. Marrieds)								
Cohabitators	0.87 (0.70–1.08)	0.210	1.03 (0.84–1.24)	0.773	0.90 (0.74–1.09)	0.296	0.60*** (0.50–0.72)	<i>p</i> < 0.001
LATs	0.77* (0.61–0.97)	0.028	1.37** (1.10–1.69)	0.004	0.92 (0.74–1.14)	0.483	0.57*** (0.46–0.69)	<i>p</i> < 0.001
Age groups (ref. 16–29)								
30–39	0.85 (0.69–1.04)	0.131	0.95 (0.79–1.14)	0.600	1.04 (0.86–1.26)	0.653	0.95 (0.79–1.13)	0.569
40–49	0.87 (0.67–1.11)	0.258	1.03 (0.81–1.30)	0.779	1.13 (0.89–1.44)	0.305	0.77* (0.62–0.94)	0.014
50–59	1.33 (0.98–1.80)	0.063	1.65*** (1.25–2.16)	<i>p</i> < 0.001	1.35* (1.01–1.79)	0.041	0.81 (0.61–1.07)	0.149
60+	2.08*** (1.39–3.10)	<i>p</i> < 0.001	1.77** (1.25–2.48)	0.001	1.40 (0.99–1.97)	0.053	0.88 (0.61–1.24)	0.457
Relationship duration	0.96*** (0.95–0.97)	<i>p</i> < 0.001	0.98*** (0.96–0.99)	<i>p</i> < 0.001	0.98*** (0.96–0.99)	<i>p</i> < 0.001	0.99* (0.97–1.00)	0.036
Number of natural children (ref. 0)								
1	0.70** (0.55–0.87)	0.002	0.80* (0.65–0.96)	0.022	0.80* (0.64–0.98)	0.039	0.74** (0.60–0.89)	0.002
2	0.78* (0.62–0.97)	0.032	0.84 (0.68–1.01)	0.066	0.94 (0.76–1.15)	0.560	0.76*** (0.62–0.91)	0.003
3+	0.81 (0.63–1.03)	0.091	0.99 (0.79–1.22)	0.897	1.02 (0.81–1.29)	0.827	0.71** (0.57–0.88)	0.002
Health and disability problems (ref. No)								
Yes	0.68*** (0.56–0.81)	<i>p</i> < 0.001	0.47*** (0.40–0.56)	<i>p</i> < 0.001	0.69*** (0.57–0.82)	<i>p</i> < 0.001	0.86 (0.74–1.00)	0.061
No. of sexual partners in life (ref. 1)								
2	0.86 (0.64–1.12)	0.27	0.76* (0.59–0.96)	0.025	1.04 (0.80–1.33)	0.771	0.86 (0.65–1.11)	0.254
3–4	0.70** (0.54–0.88)	0.003	0.69*** (0.56–0.84)	<i>p</i> < 0.001	1.03 (0.82–1.27)	0.817	0.83 (0.66–1.03)	0.105
5+	0.70** (0.56–0.87)	0.001	0.63*** (0.51–0.75)	<i>p</i> < 0.001	1.01 (0.81–1.23)	0.962	0.79* (0.64–0.95)	0.017

**Table 3** (continued)

Proportional odds model (POM)								
Females	Emotional closeness		Compatibility in sexual interest		Compatibility in sexual preferences		Relationship Happiness	
	Model 1	p value	Model 2	p value	Model 3	p value	Model 4	p value
Attempt sex without respondent's will (ref. No)								
Yes	0.63*** (0.52–0.74)	<i>p</i> < 0.001	0.68*** (0.56–0.81)	<i>p</i> < 0.001	0.76** (0.62–0.92)	0.006	0.84* (0.71–0.98)	0.027
Educational attainment (ref. None)								
Degree level qualification	0.78 (0.57–1.04)	0.094	0.57*** (0.56–0.81)	<i>p</i> < 0.001	0.78 (0.59–1.02)	0.073	0.93 (0.68–1.27)	0.668
Other higher and advanced level	1.05 (0.77–1.42)	0.736	0.67** (0.51–0.86)	0.002	0.96 (0.73–1.26)	0.777	0.89 (0.64–1.22)	0.463
GCE, O-level/equivalent/other	0.97 (0.73–1.27)	0.807	0.84 (0.66–1.05)	0.125	0.90 (0.69–1.15)	0.393	0.99 (0.72–1.34)	0.935
<i>N</i>	3940			3940				3940

NATSAL-3 data, own computations; weighted data; *N* number of subpopulation analysed (females); Models 1, 2, 3, 4 include: partnership type, age groups, relationship duration, number of children; respondent's health and disability status in the last year, number of sexual partners (heterosexual and homosexual) in life, if someone attempted sex without respondent's will, educational attainment; the results are presented as odds ratios; POM: proportional odds model; confidence intervals in parenthesis; \*\*\**p* < 0.001, \*\**p* < 0.01, \**p* < 0.05

**Table 4** Proportional odds regression models of emotional closeness, compatibility in sexual interest, sexual preferences, and relationship happiness for males

Proportional Odds Model (POM)								
Males	Emotional closeness		Compatibility in sexual interest		Compatibility in sexual preferences		Relationship Happiness	
	Model 1	p value	Model 2	p value	Model 3	p value	Model 4	p value
Partnership type (ref. Marrieds)								
Cohabitors	0.86 (0.66–1.11)	0.261	0.99 (0.77–1.27)	0.987	1.07 (0.83–1.38)	0.588	0.79 <sup>a</sup> (0.61–1.00)	0.051
LATs	1.04 (0.76–1.41)	0.795	2.10*** (1.59–2.78)	<i>p</i> < 0.001	1.52** (1.15–2.01)	0.003	0.55*** (0.41–0.71)	<i>p</i> < 0.001
Age groups (ref. 16–29)								
30–39	0.71* (0.54–0.92)	0.013	0.99 (0.77–1.25)	0.912	0.86 (0.67–1.09)	0.231	0.84 (0.67–1.05)	0.136
40–49	0.88 (0.63–1.21)	0.438	1.06 (0.79–1.41)	0.694	1.22 (0.91–1.61)	0.171	0.81 (0.62–1.06)	0.125
50–59	0.77 (0.54–1.10)	0.157	1.45* (1.01–2.05)	0.039	1.36 (0.96–1.92)	0.082	0.83 (0.58–1.17)	0.281
60+	1.15 (0.75–1.76)	0.517	2.19*** (1.49–3.22)	<i>p</i> < 0.001	1.66** (1.14–2.42)	0.008	1.01 (0.67–1.50)	0.963
Relationship duration	1.02 (0.98–1.02)	0.882	0.98*** (0.96–0.99)	<i>p</i> < 0.001	0.98*** (0.96–0.99)	<i>p</i> < 0.001	0.99 (0.98–1.00)	0.169
Number of natural children (ref. 0)								
1	1.48** (1.13–1.92)	0.004	1.02 (0.80–1.30)	0.855	1.26 (0.97–1.62)	0.073	1.02 (0.80–1.31)	0.844
2	1.04 (0.81–1.34)	0.737	0.85 (0.67–1.06)	0.162	0.99 (0.77–1.25)	0.927	0.93 (0.73–1.17)	0.531
3+	1.01 (0.81–1.34)	0.965	0.79 (0.60–1.02)	0.080	0.96 (0.73–1.24)	0.759	0.85 (0.65–1.09)	0.215
Health and disability problems (ref. No)								
Yes	0.80 (0.62–1.02)	0.080	0.69** (0.54–0.86)	0.001	0.75* (0.59–0.93)	0.010	0.73** (0.58–0.91)	0.007
No. of sexual partners in life (ref. 1)								
2	0.73 (0.51–1.04)	0.149	0.77 (0.54–1.07)	0.118	0.71 (0.48–1.04)	0.083	0.89 (0.60–1.31)	0.556
3–4	0.73 (0.51–1.04)	0.084	0.69* (0.51–0.91)	0.010	0.78 (0.58–1.04)	0.093	0.59** (0.42–0.82)	0.002
5+	0.64** (0.47–0.85)	0.003	0.70** (0.55–0.88)	0.003	0.72** (0.56–0.91)	0.007	0.64** (0.48–0.83)	0.001

**Table 4** (continued)

Males Variables	Proportional Odds Model (POM)							
	Emotional closeness		Compatibility in sexual interest		Compatibility in sexual preferences		Relationship Happiness	
	Model 1	p value	Model 2	p value	Model 3	p value	Model 4	p value
Attempt sex without respondent's will (ref. No)	0.85 (0.53–1.35)	0.496	0.82 (0.52–1.29)	0.400	0.94 (0.59–1.49)	0.795	0.75 (0.47–1.17)	0.204
Yes								
Educational attainment (ref. None)	0.74 (0.50–1.10)	0.142	0.52*** (0.36–0.73)	<i>p</i> < 0.001	0.69* (0.48–0.98)	0.040	0.58** (0.37–0.87)	0.010
Degree level qualification								
Other higher and advanced level	0.79 (0.53–1.16)	0.238	0.79 (0.56–1.10)	0.166	0.78 (0.55–1.11)	0.173	0.65* (0.42–0.99)	0.046
GCSE, O-level/equivalent/other	0.85 (0.57–1.25)	0.416	0.80 (0.56–1.13)	0.202	0.93 (0.64–1.32)	0.684	0.63* (0.40–0.97)	0.036
N	2561		2561		2561		2562	

NATSAL-3 data, own computations; weighted data; N number of subpopulation analysed (males); Models 1, 2, 3, 4 include: partnership type, age groups, relationship duration, number of children; respondent's health and disability status in the last year, number of sexual partners (heterosexual and homosexual) in life, if someone attempted sex without respondent's will, educational attainment; the results are presented as odds ratios; POM: proportional odds model; confidence intervals in parenthesis; \*\*\**p* < 0.001, \*\**p* < 0.01, \**p* < 0.05, *a* = 0.051,;

lower category of the emotional closeness outcome are about 23% lower among women in LAT than among those in married relationships. There are no differences in emotional closeness between women in married and cohabiting relationships, or between those in LAT and cohabiting relationships (Additional file 1: Table S1).

Model 2 investigates the link between partnership type and respondents' reported compatibility in sexual interest with their partners. This outcome is associated with partnership type similarly for women and men. Among men, the odds of those in LAT reporting higher rather than lower compatibility in sexual interest with their partner are more than double than those of married (OR=2.10), and cohabiting (OR=2.11; Additional file 1: Table S1). Among women, the odds of those in LAT relationships reporting higher rather than lower compatibility in sexual interest are about 37% and 33% higher than those of married and cohabiting, respectively. Cohabiting women are no different to married women in their sexual interest compatibility with their partner.

Model 3 investigates the link between partnership type and compatibility in sexual preferences with a partner. The outcome is associated with partnership type for males, but not for females. Men in LAT relationships tend to report being more compatible with their partner in terms of sexual preferences than married, and cohabiting men (Additional file 1: Table S1); the odds of reporting higher levels of compatibility in sexual preferences among men in LAT are about 52% and 42% higher than among married, and cohabiting men, respectively. Cohabiting men are no different than those married in their reports of compatibility in sexual preferences.

Model 4 investigates the link between partnership type and relationship happiness. This outcome is related to partnership status similarly for men and women. Those in LAT and cohabiting partnerships are significantly less happy in their relationship as compared to those married (Additional file 1: Table S1). However, the relationship happiness difference between cohabiting and married men is nearly significant (Table 4,  $p = 0.051$ ), so caution is needed when interpreting this result.

Concerning control variables, it is interesting that women aged 60+ are more likely than those aged 16–29 to report high levels of emotional closeness during sex (Table 3). In addition, men and women aged 50+ tend to report higher levels of compatibility in sexual interest, and preferences with their partner (Table 4). Gabb (2022) found that despite body capabilities had changed, couples at an old age embraced these changes and enjoyed sexual intimacy, especially if their adult child had left the parental home. Considering the findings of this study, it might be that individuals at later life stages are going through a new phase of rediscovering and accepting themselves and their partner. The results might also be explained by the 'sexual wisdom' accumulated over the years (Forbes et al., 2017). Sexual wisdom is a term coined by Forbes et al. (2017) to explain why in their study later ages were associated with high sexual quality of life: it is the acquisition of knowledge, skills, and preferences during life (sexual wisdom).

Relationship duration is negatively associated with all outcomes for women. For men, only compatibility in sexual interest, and preferences tend to decrease with relationship duration. Women with one child tend to report lower levels of sexual intimacy, while those with more than one child report lower levels of relationship happiness. Men with one child compared to those childless report reduced emotional closeness during sex. Having had health and disability problems in the past year is related to reduced sexual

intimacy for both men and women. Women with 5+ and men with 3+ sex partners in life report lower levels of relationship happiness. Sex attempts without women's will are associated with lower levels of sexual intimacy, and relationship happiness. More educated women and men report lower compatibility in sexual interest with their partners. For men, being more educated is also associated with reduced compatibility in sexual preferences, and relationship happiness.

The results support the general expectation, that sexual intimacy would differ by women's partnership status (Hypothesis 1), showing significant associations with emotional closeness during sex, and compatibility in sexual interest (but not with compatibility in sexual preferences). The results do not support Hypothesis 2, that sexual intimacy would not differ by men's partnership status, showing significant associations with compatibility in sexual interest, and preferences (but not with emotional closeness during sex).

## Discussion

This study brought together the sex and demographic literature on partnership dynamics to provide new insights on how sexual intimacy and relationship happiness differ across married, cohabiting, and LAT relationships in Britain.

First, the nature of LAT is defined more by the sexual dimension of the relationship compared to coresidential relationships; men and women in LAT are more compatible with their partners in terms of sexual interest as compared to those married and cohabiting. Moreover, men in LAT relationships also share more similar sexual preferences with their partner than coresidential men. However, LAT, cohabiting, and marriage are not demographic categories with distinct boundaries, representing rather relationship stages. Individuals usually start their relationship by dating, a period which may be followed by moving in together, and eventually marriage. Therefore, it is expected that sex will be more important in the first stage of the relationship development as sex is a "glue" for relationships, promoting bonding, security, and reinforcing the feeling of happiness, love, and commitment (Muise et al., 2016; Schwartz et al., 2013). Perhaps the "glue" will gradually be replaced with non-sexual aspects, such as sharing or buying a house, having joint finances or children which are more commonly a characteristic of coresidential relationships. In addition, in the absence of joint investments, such as buying a house, paying the mortgage together, and having children, sex may be a more important investment and valued resource for LATs, and this may explain why they enjoy greater sexual intimacy than coresidential couples.

Second, cohabiting relationships are similar to married relationships in their sexual intimacy. Earlier studies have found that cohabitators report higher sexual frequency than marrieds, being characterised as a 'sexier' living arrangement (Blumstein & Schwartz, 1983). Nonetheless, more recent studies reveal no significant differences between cohabitation and marriage in sexual frequency and sexual satisfaction changes over time (Schmiedeberg & Schröder, 2016). The findings from this paper add to these latest studies, and might be attributed to the theory of diffusion, which stipulates that as cohabitation is more accepted and spread in a society, the narrower the differences between these two relationships become (Liefbroer & Dourleijn, 2006). Since cohabitation is highly accepted and spread in the British society (Beaujouan & Ní Bhrolcháin, 2011), and sex



outside marriage is practiced at younger ages across cohorts (Mercer et al., 2013), it may be that marriage and cohabitation provide a similar social and emotional context for expressing intimacy, and evaluating sexual aspects.

Third, cohabiting individuals report lower levels of relationship happiness than married individuals, a finding in line with past research (Perelli-Harris et al., 2019). This result might be explained by the findings from the qualitative research conducted in Britain (Berrington et al., 2015); participants stressed that marriage signals a more committed relationship than cohabitation, and conveys a greater expectation of permanency (Berrington et al., 2015). Moreover, the results of this study might mirror the different legal treatment of marriage and cohabitation in Britain; as marriage is more protected by law than cohabitation (Barlow, 2014), married couples might feel more secure and, consequently, are happier than cohabiting couples.

Fourth, those in LAT relationships report lower levels of relationship happiness than those married, a finding in line with previous studies (Lewin, 2017; Tai et al., 2014). The result might reflect the different degrees of commitment, and emotional security these two relationships entail. In Britain, LAT relationships are seen by some as lacking the strong commitment, emotional, and sexual intimacy a cohabiting or married relationship entails (Duncan & Phillips, 2010, Carter et al., 2016), whereas marriage is generally perceived as involving the ultimate commitment, being a promise for a life-long partnership (Berrington et al., 2015). In addition, since LAT couples do not benefit from any legal rights, they may feel less secure in their relationship compared to married couples. The lack of legal protection against the risks of joint investments in case of dissolution may, in turn, explain the lower levels of LATs' relationship happiness. However, these findings may also suggest a selection effect of those who are happier with their relationships into marriages, this being one of the main limitations of this study.

Also, given that LAT couples are more sexually compatible with their partner but less happy in their relationship than married couples makes us question the role of physical distance. Is it that LAT couples are less happy in their relationship than those married due to distance? Or is distance (and not living together) a reason for LAT couples to enjoy their sexual life more than married couples?. This paper does not answer these questions due to data limitations but leaves them as a suggestion for future work.

This paper provides new evidence, that, among men, those in in LAT partnerships feel less happy in their relationships than those cohabiting. It may be that a cohabiting relationship is perceived by men as a more secure type of relationship, where they receive more support (Lewin, 2017), social, and emotional benefits than in an LAT relationship. However, since this difference very closely brushed the limit of statistical significance, the findings have to be interpreted with caution. Future (qualitative) research is needed to shed light on how the meaning of a cohabiting relationship differs from that of an LAT relationship in terms of love, security, and health among men.

Married women more often reported being emotionally close during sex to their partner than those in LAT relationships. Women prefer long term committed relationships to casual sexual relationships or short dating relationships to express sexual intimacy, because in the former, they feel more protected and secure (Peplau, 2003). It is known that in Britain marriage entails the romantic view of a life-long relationship with "the one" and represents the "eternal commitment" (Berrington et al., 2015, p. 336–337),

which offers important emotional and psychological security (Berrington et al., 2015). In contrast, LAT relationships have not been characterised by such a high level of commitment, but by greater autonomy, space, and freedom as compared to coresidential relationships, benefits which were more often reported by women (Duncan et al., 2014). Consequently, marriage may provide a more secure, and comfortable context for women to express their emotional side during sex compared to LAT relationships.

There are several limitations to this study. First, to respond to sexual intimacy and relationship happiness questions, individuals needed to be sexually active in the last year before the interview. Therefore, the sample might be selective of those more (sexually) satisfied in their relationship, and perhaps of those with greater sexual intimacy than those who are not sexually active. Furthermore, Natsal-3 restricts the sample to individuals in a sexual relationship for at least 1 year. This leaves out relationships of shorter duration and limits the generalisability of the results. However, the results confirm the broad literature on partnership differences in relationship happiness, underling the positive benefits of marriage (Lee & Ono, 2012; Musick & Bumpass, 2012). Finally, given the cross-sectional nature of Natsal-3, the analysis is merely descriptive. It would be useful if demographic panel data collects information about people's sexual intimacy aspects so that longitudinal analysis can be applied to investigate the link between changes in sexual intimacy or relationship happiness and partnership stability.

Despite these limitations, this study represents an important contribution to the understanding of the changing nature of partnerships, using a unique database which asks about emotional closeness and sexual compatibility, aspects understudied by family demographers, especially with national representative data. While cohabitation and marriage offer seemingly similar contexts for expressing intimacy and sexuality, LAT offers a distinct context, where the non-coresidential aspect seems to have a positive impact for physical intimacy, even if LATs are less happy with their relationship. Finally, this work suggests that experiences of sexual intimacy are different among men and women in the same relationship type. More research is needed on other sexual aspects of relationships to shed new perspectives on the nature of partnerships.

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s41118-022-00178-2>.

**Additional file 1: Table S1.** Odds ratios from proportional odds regression models for key independent variables with response categories switched. **Table S2.** Natsal-3 (2010-2011) sample broken down in categories which are not part of the analytical sample due to filters.

### Acknowledgements

Not applicable.

### Author contributions

AAC is the single author of this paper, responsible for the its concept, design, analysis, interpretation and writing-up. The author read and approved the final manuscript.

### Funding

This work was supported by the Economic and Social Research Council ES/J500161/1 as part of the PhD thesis of Alexandra-Andreea Ciritel, conducted at the University of Southampton, UK.

### Availability of data and materials

The data set analyzed during the current study are available in the UK Data Service repository, SSN 7799, [<https://beta.ukdataservice.ac.uk/datacatalogue/studies/study?id=7799>].

## Declarations

### Competing interests

The authors declare that they have no competing interests.

Received: 13 May 2022 Accepted: 13 September 2022

Published online: 21 November 2022

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