ORIGINAL PAPER

Big Five personality traits and sex

Uwe Jirjahn[1] · Martha Ottenbacher[2]

Abstract

Sexual well-being plays an important role in the quality of life. Against this background, we provide an economics-based approach to the relationship between the Big Five personality traits and various dimensions of sexuality. From a theoretical viewpoint, personality influences sexual well-being not only by how a person feels about sex, but also by how the person behaves in a sexual relationship. Personality shapes information sharing about sexual preferences, the way dissonant sexual preferences of the partners are handled, and the extent to which a person is committed to promises made to a partner. Using a large representative dataset from Germany, we find that personality traits play a role in a person's own sexual satisfaction, in (the self-assessment of) fulfilling their partner's sexual needs and desires, in sexual communication, in actual and desired frequency of sex, and in extradyadic affairs. Conscientiousness contributes to a mutually beneficial sex life and increases a person's commitment to their partner. The opposite holds true for neuroticism. While extraversion and openness to experience help realize a mutually beneficial sex life, we find no evidence that they have a commitment value. On the contrary, extraversion is associated with lower commitment to the partner. Agreeableness contributes to higher commitment. However, agreeableness appears to make people more reluctant to express their sexual needs and desires.

✉ Uwe Jirjahn
   jirjahn@uni-trier.de

   Martha Ottenbacher
   martha.ottenbacher@uni.lu

[1] Lehrstuhl Für Arbeitsmarktökonomik, University of Trier, Universitätsring 15, 54286 Trier, Germany

[2] University of Luxembourg, Luxembourg, Luxembourg

  🖄 Springer

1 Introduction

Sex is an essential component of romantic relationships and quality of life. As suggested by a time diary study conducted by Kahneman et al. (2004), sex is the highest ranked activity in terms of net positive emotional affect even though it occupies a relatively small fraction of total time. Sexual well-being is associated with relational satisfaction, relationship stability, and happiness in general (Blanchflower and Oswald 2004; Cheng and Smyth 2015; Laumann et al. 2006; Rainer and Smith 2012; Schmiedeberg et al. 2017; Sprecher 2002). Sexual well-being is also of high political interest. The World Health Organization (2006) emphasizes that improving sexual health (i.e., a state of physical, emotional, and social well-being in relation to sexuality) remains a public health priority across the globe.

The importance of sex for quality of life gives rise to the question of which factors influence sexual well-being. Our analysis addresses this question by examining the influence of the Big Five personality traits (extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism) on various key dimensions of sexuality. We provide both a theoretical discussion and an empirical analysis.

The theoretical discussion develops an economics-based approach to personality and sex. Considering the dual role of personality, we argue that personality is not only a parameter shaping a person's sexual preferences. Personality is also a parameter shaping the person's behavior in a sexual relationship. Therefore, personality influences sexual well-being through how the person behaves in a sexual relationship. First, it shapes communication and information sharing about sexual preferences. Communication helps reduce partners' incomplete information about each other's sexual preferences so they can coordinate on their preferences and realize a win–win situation. Second, personality influences how partners handle dissonant sexual preferences. There are different ways of handling dissonant preferences. On the one hand, altruism may reduce the degree of disagreement. On the other hand, partners may bargain over their sexual activities. Personality shapes a person's altruistic behavior, bargaining tactics and bargaining power. Third, personality influences how commitment problems are solved. A person may promise to be faithful to the partner or to practice or relinquish specific sexual practices but later may be tempted to break the promise. The person's commitment to the promise depends on his or her self-control, fair-mindedness, inclination to comply with norms, and willingness to reciprocate the partner's cooperative behavior.

Our empirical analysis uses the pairfam (Panel Analysis of Intimate Relationships and Family Dynamics), a large representative dataset from Germany, to examine the link between the Big Five personality traits and sexuality. The results provide evidence that the Big Five personality traits play an important role in a person's sex life. Our estimations show that personality traits have an influence on a person's own sexual satisfaction. Moreover, conforming to the notion that personality shapes the behavior in a sexual relationship, our results suggest that

a person's personality also plays a role in their partner's sexual fulfillment. Thus, a person's personality influences whether partners can realize a sexual win–win situation (a mutually beneficial sex life). Examining possible transmission channels through which personality has an impact on people's sexual well-being, we show that personality traits are associated with the quality of sexual communication and the actual and desired frequency of sex. Finally, analyzing the determinants of extradyadic affairs, we demonstrate that personality has an influence on a person's commitment to their partner.

Our study contributes in several ways to the economic literature. While economists have been increasingly interested in the determinants of people's well-being (see Frey 2008 and Frey and Stutzer 2002 for surveys), sex has remained an under-researched topic in economics. A few economic studies have examined the link between sex and happiness (Blanchflower and Oswald 2004; Cheng and Smyth 2015; Loewenstein et al. 2015; Rainer and Smith 2012) or the determinants of infidelity (Adamopoulou 2013; Bishai and Grossbard 2010; Fair 1978; Potter 2011; Smith 2012). Those studies have not considered the role of personality traits. Our study emphasizes the importance of personality for sexual well-being and provides broader insights into various dimensions of sexuality.

On a broader scale, we also address a general research gap in family economics. Apart from some notable exceptions (Averett et al. 2020; Boxho et al. 2020; Dupuy and Galichon 2014; Flinn et al. 2018; Lundberg 2011, 2012), studies in family economics have paid little attention to the personality of partners as a determinant of the surplus of romantic relationships. This contrasts with studies in labor economics where a rapidly increasing body of research has examined the influence of personality traits on human capital formation and labor market outcomes (Almlund et al. 2011; Borghans et al. 2008). This development in labor market research has been identified as "one of the most exciting developments in labor economics over the past decade" (Cobb-Clark 2015: p. 1). Our study suggests that considering personality traits may lead to a similarly exciting development in family economics.

The link between personality and sex is a topic typically examined by psychologists (Allen 2019; Allen and Walter 2018). Against this background, our study follows a trend in economics to expand its scope of inquiry to topics traditionally addressed by other scientific disciplines. Of course, expanding the boundaries of economics into other social sciences by using larger and representative datasets or examining explanatory variables with greater statistical sophistication would be of limited value if it does not yield additional theoretical insights. A successful expansion of the scope of inquiry into nontraditional topics requires incorporating the new topics into economic thinking (Lazear 2000). Thus, to guide our empirical analysis, we provide an informal theoretical background discussion that integrates the psychological topic into the analytical framework of economics and, particularly, relates the topic to family economics.

The rest of the paper is organized as follows. Section 2 provides the theoretical background discussion. Section 3 describes the data and variables. Section 4 presents the empirical results. Section 5 discusses the results in light of our theoretical considerations. Section 6 concludes.

2 Background discussion

In what follows, we set the stage by providing a brief introduction to the Big Five model. We proceed with a theoretical discussion on the transmission channels through which the Big Five personality traits can influence sexuality. Developing an economics-based approach, we first describe general transmission channels and then relate the Big Five personality traits to these channels.

2.1 The Big Five personality traits

Psychologists view personality as enduring patterns of feelings, thoughts, and behaviors (Roberts 2009). Personality reflects the tendency of a person to respond in certain ways under certain circumstances. The most widely shared taxonomy of personality traits in psychology is the Big Five model (John et al. 2008; McCrae and Costa 2008). The Big Five model originated in Allport and Odbert's (1936) lexical approach positing that individual differences in personality are encoded in language. Analyzing personality-describing words, psychologists concluded that personality traits can be organized into five dimensions. Since Goldberg (1981), the five dimensions of personality have been known as the Big Five. The Big Five personality traits are extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism. These personality traits have high predictive power for a series of important life outcomes such as educational achievement, job performance, health, mortality, criminality, and divorce (Almlund et al. 2011; Borghans et al. 2008; Roberts et al. 2007).

Extraversion reflects the degree to which a person orients his or her interests and energies toward the outer world of people, i.e., toward social attention and social interaction. Persons with a higher degree of extraversion tend to be characterized by warmth, sociability, assertiveness, activity, excitement seeking, and positive affect.

Openness to experience reflects the degree to which a person is open to change, variety, intellectual stimulation, and new cultural experiences. Persons with a higher degree of openness tend to be characterized by fantasy, esthetics, and ideas.

Conscientiousness reflects the degree to which a person is willing to comply with conventional rules, standards, and norms. Persons with a higher degree of conscientiousness tend to be characterized by order, dutifulness, achievement striving, self-discipline, and deliberation.

Agreeableness reflects the degree to which a person needs pleasant and harmonious relations with others. Persons with a higher degree of agreeableness tend to be characterized by trust, straightforwardness, cooperativeness, altruism, compliance, modesty, and tender-mindedness.

Neuroticism (emotional instability) reflects the degree to which a person experiences the world as threatening and beyond his or her control. Persons with a higher degree of neuroticism tend to be characterized by anxiety, angry hostility, psychological distress, self-consciousness, impulsiveness, and vulnerability.

It is important to note that the Big Five not only influence how a person, in general, feels about the world. The Big Five are also dispositional traits influencing the overall style of the person's adjustment to and engagement of the social world (Buss 1996; Goldberg 1981; McAdams and Pals 2006; Nettle 2006). These traits describe the degree to which the person is able to solve social adaptive problems through communication, cooperation, trust, stability, and dominance.

Similarly, economists emphasize that personality traits play dual roles (Borghans et al. 2008). On the one hand, they can be a source of pleasure, i.e., they influence the utility a person derives from social relationships. On the other hand, personality traits can be viewed as capacities and constraints in the choices the person makes. These choices, in turn, have consequences for the quality of social relationships.

At issue is how personality traits influence sexuality. In what follows, we first provide a general discussion on the transmission mechanisms through which personality may have an effect on sexuality. The discussion is developed within an economics-based approach to integrate this psychological topic into the analytical framework of economics and, in particular, to relate it to family economics. Building from that discussion, we derive specific implications for the link between the Big Five personality traits and sexuality.

2.2 An economics-based approach to personality and sex

The dual role of personality also applies to sexuality. On the one hand, personality can influence how much a person enjoys sex. Thus, from the viewpoint of economics, personality has an influence on the utility a person derives from sex. Personality can be seen as a parameter that shapes the utility functions of people.[1] To the extent people differ in their personality, they will have heterogeneous preferences for sex. Depending on personality, sex will be of higher utility for some people than for others.

On the other hand, personality is a parameter shaping a person's behavior in a sexual relationship. This behavior has an influence on the quantity and quality of sex and, hence, on the extent of sexual fulfillment in the relationship. Thus, personality influences the utility from sex through how the person behaves in a sexual relationship. The person's behavior in a sexual relationship is important for at least three reasons. First, it influences communication and information sharing about sexual preferences. Second, it influences how dissonant preferences of the partners are handled. Third, it influences how commitment problems are solved.

Sexual relationships can suffer from information asymmetries (Rainer and Smith 2012). If partners have incomplete information about each other's needs and desires, they may fail to coordinate on their preferences resulting in a suboptimal sex life. Communication helps partners reduce incomplete information about their sexual preferences. By talking and listening, partners can share information about each other's preferences for sexual practices, frequency of intercourse, or timing of orgasm.

---

[1] Peterson et al. (2011) provide evidence that preferences for sex acts depend on personality traits.

This may allow them to find sexual activities working best for them and, hence, resulting in higher mutual sexual satisfaction. However, successful sexual communication requires communication skills, and these skills depend on the partners' personality traits. Personality influences a person's willingness to talk about own preferences and to listen to the partner. Moreover, it has an influence on whether the style of communication is characterized by warmth and empathy or by hostility and impulsiveness.

At best, partners have compatible preferences for sex. so couples with strong communicative skills can realize a sex life that is more satisfying to both of them. But when partners have partially dissonant preferences (e.g., for oral sex, anal sex, timing of orgasm, frequency of intercourse, or pornography consumption), the question arises as to how they handle these dissonant preferences. One possibility is that altruism reduces the degree of disagreement. Altruism can be modeled as an interdependency of utility functions (Bergstrom 1997; Weiss 1997). If a person not only cares about his or her own sexual enjoyment, but also about the partner's enjoyment, he or she will take the partner's preferences for sexual activities into account. This can be seen as a gift given to the partner. On the one hand, an altruistic person to some extent sacrifices his or her utility by forgoing some preferred sexual activities or engaging in activities only preferred by the partner. On the other hand, the altruistic person derives utility from the partner's sexual enjoyment. Moreover, if altruism leads to reciprocal gift exchange, a couple may realize higher mutual sexual satisfaction. Of course, people can differ in the degree of altruistic behavior, and personality has an influence on that degree. Thus, it depends on the partners' personalities whether altruism can solve the problem of dissonant sexual preferences.

It appears to be reasonable to assume that, in general, people are not completely altruistic, but to a greater or lesser extent also exhibit self-interest and care about their own sexual enjoyment. Family economics assumes that dissonant preferences of self-interested household members lead to an intra-household bargaining situation (Agarwal 1997; Komura 2013; Lundberg and Pollak 1996; Yakita 2018). This approach can also be applied to sexual preferences. Partners may solve the problem of dissonant sexual preferences by bargaining over their sexual activities. Personality has an influence on a person's bargaining strength and, hence, on whether he or she can achieve a favorable bargaining outcome. Assertiveness is likely to be associated with a more favorable bargaining outcome for the person while a high willingness to compromise may rather result in a less favorable outcome. In particular, personality may have an influence on the person's threat point. A more sociable person with better communication skills may have better opportunities to find a new partner in case of a disagreement. Better outside options increase the person's bargaining position in the current relationship and help get through his or her preferred sexual activities.

If partners reach a common understanding and agreement on their sexual relationship, commitment problems arise. The common understanding and agreement on the sexual relationship are based on promises partners make to each other. A person may promise to be faithful to the partner or to practice or relinquish specific sexual activities, but later may be tempted to break the promise. The promises made to the partner cannot be made binding through legal enforcement. Thus, the question is if there are other mechanisms ensuring that promises made to the partner are

kept. An agreement may be self-enforcing in a repeated game setting (Lundberg and Pollak 1994). In a repeated game setting, partners reward each other's cooperative behavior and threaten to punish opportunistic behavior by refusing cooperation in the future. However, repeated games do not always work. A person is only deterred from opportunistic behavior if he or she does not discount the future loss of cooperation too much. Moreover, repeated games involve multiple equilibria, i.e., not only mutual cooperative behavior is an equilibrium, but also mutual opportunism. We suggest that personality is a parameter playing an important role in whether or not an agreement on sexual activities is self-enforcing. On the one hand, a person's fair-mindedness, inclination to comply with norms, and willingness to reciprocate the partner's cooperative behavior increase his or her commitment to the agreement. On the other hand, sociability and communication skills may lead to alternative outside options increasing the temptation to engage in opportunistic behavior.

2.3 Implications for the link between Big Five personality traits and sex

In our empirical analysis, we examine the link between the Big Five personality traits and sexual satisfaction. Considering the dual role of personality, the Big Five may not only have an impact on sexual satisfaction by shaping a person's utility function, i.e., by influencing the pleasure the person enjoys from sexual activities. The Big Five may also have an impact through the person's behavior in a sexual relationship and, hence, through the sexual activities the couple does together. In order to gain insights into the transmission channels through which the Big Five have an influence on sexual satisfaction, we also examine a series of behavioral outcome variables. We analyze the determinants of sexual communication. This gives us insights into the role of information sharing in sexual relationships. Furthermore, we examine the degree in which a person meets the partner's needs. This provides indications of whether a person can realize a win–win situation within the sexual relationship. Moreover, we consider the actual and the desired frequency of intercourse. Finally, we examine if a person has sex with someone other than the partner. This provides insights into how the Big Five influence commitment problems and the outside options of the person.

Extraversion and openness to experience should be positively associated with sexual satisfaction. One transmission channel through which these personality traits influence sexual satisfaction is better communication with the partner. Better communication enables a more extroverted and open person to express his or her sexual preferences so that the partner can take into account these preferences. Better communication also implies that the person obtains more information about the partner's preferences so that a win–win situation may be realized. However, greater communication skills make it also easier to get in contact with other potential partners meaning that a more extroverted and open person has better outside options.[2] Better

---

[2] This view is supported by research on personality and friendships (Doroszuk et al. 2019). Extroverts have more friends, make new friends faster in novel situations, and attract other people with their style. Openness to experience is also associated with a larger network of friends and higher interpersonal attraction.

outside options increase the person's bargaining position. While this provides the second transmission channel through which extraversion and openness should result in higher sexual satisfaction, it makes the implications for the partner's sexual fulfillment ambiguous. A more extroverted and open person may get through his or her preferred sexual activities at the expense of the partner's needs and desires. Better outside options may also result in more severe commitment problems. A more extroverted and open person with better outside options may be more tempted to breach an agreement with the partner and to have sex with someone other.

By contrast, conscientiousness can be expected to have a commitment value in a sexual relationship. A higher degree of conscientiousness is associated with greater self-control, sense of responsibility, and dependability. A more conscientious person is rule-abiding and has a stronger focus on long-term relationship. Thus, a more conscientious person should be more likely to resist short-term temptations and to keep promises made to the partner (Peetz and Kammrath 2011). To the extent this induces a more cooperative behavior of the partner, a higher degree of conscientiousness can also result in increased own sexual satisfaction. Moreover, conscientiousness may contribute to a more balanced style of sexual communication leading to more successful information sharing and mutually beneficial outcomes for the partners.

Agreeableness may also contribute to more successful information sharing. An agreeable person is more empathic and tender-minded and, hence, has a more harmonious communication style allowing partners to realize a mutually beneficial sex life. Furthermore, agreeableness is positively associated with altruism (Becker et al. 2012). Thus, an agreeable person should take the partner's needs and desires to a higher degree into account. To the extent this induces positive reciprocal behavior of the partner and, hence, mutual gift exchange in the sexual relationship, a higher degree of agreeableness can result in higher own sexual satisfaction. However, when bargaining over sexual activities, an agreeable person may compromise too much. The person may be reluctant to express her needs and desires for the sake of harmony. In particular, a higher degree of altruism can lead an agreeable person to scarify his or her sexual needs in favor of the partner's needs. This suggests that the implications of agreeableness for own sexual satisfaction are ambiguous. Nonetheless, even if an agreeable person to some extent sacrifices his or her sexual needs, this does not necessarily imply a negative influence on sexual satisfaction. Altruism means that a person also derives utility from the partner's sexual fulfillment. A higher sexual fulfillment of the partner may compensate an agreeable person for giving up some of their own sexual wishes. Moreover, agreeableness is associated with humility (McCrae and Costa 2008; Van Kampen 2012).[3] Humility implies that a person is satisfied even with less. Thus, an agreeable person may gain sexual satisfaction even if he or she sacrifices some of his or her needs.

Neuroticism can have a negative impact on sexuality for several reasons. As emphasized by Eysenck (1971, 1976), a person with a higher score on neuroticism tends to have more fears about sexuality and may be more disgusted about some aspects of sexuality. This suggests that a person with a higher score on neuroticism derives less

---

[3] While humility is a component of agreeableness in the Big Five model, it belongs to an additional dimension of personality (the honesty-humility dimension) in the alternative HEXACO model (Ashton et al. 2014).

utility from sex than someone with a lower score. Moreover, neuroticism can have a negative impact on sexual satisfaction through the person's behavior in a sexual relationship. Emotional instability tends to entail inadequate and hostile sexual communication (Velten and Margraf 2017). For example, a neurotic person may overreact to criticism triggering negative responses from the partner. This results in poor information sharing and makes it difficult to realize a mutually beneficial sex life. Furthermore, negative emotions are associated with low self-control and a high discounting of the future (Loewenstein 2000). This aggravates commitment problems. A neurotic person is more likely to feel neglect or rejection from the partner, i.e., the person believes that he or she is no longer loved. This can increase the person's propensity to seek an extradyadic sexual relationship (Josephs and Shimberg 2010).

3 Data and variables

3.1 The dataset

Our empirical analysis is based on data from the pairfam (Brüderl et al. 2018; Huinink et al. 2011). A handful of studies used the data to examine some aspects of sexuality (Hajek 2019; Kislev 2020; Morgan et al. 2018; Rainer and Smith 2012; Schmiedeberg et al. 2017; Schmiedeberg and Schröder 2016; Schröder and Schmiedeberg 2015; Smith 2012). However, these studies did not consider the influence of personality traits on sexuality.

pairfam is a nationally representative panel study for Germany funded by the German Research Foundation (DFG). The focus of the pairfam study is on intimate relationships and family relations. A nucleus of themes is addressed annually. Different additional topics are sampled in consecutive waves. The survey includes both a personal interview by a professional interviewer and a self-administered questionnaire for intimate questions. The self-administered questionnaire is completed during the interview using the official survey laptop. In order to avoid interviewer effects, reporting bias, and refusal to answer questions, all questions on sexuality are asked in the self-administered questionnaire.[4]

---

[4] Self-reports are the dominant method of data collection in sexual behavior research. Questions on sexuality address very sensitive issues and may entail possible problems of reporting bias or item nonresponse. Optimizing self-report methodology is widely seen as having the greatest potential for improving sexual behavior research (McCallum and Peterson 2012). A series of studies show that self-administered questionnaires substantially improve the quality of a survey. Castelo-Branco et al. (2010) provide evidence of a substantial over-reporting of sexual activity and importance of sex in personal interviews as compared to anonymous questionnaires. A meta-study by Gnambs and Kaspar (2015) suggests that particularly computerized surveys contribute to truthful responding. Anonymous and computerized surveys not only mitigate biased reporting, but also reduce the problem of item nonresponse to sensitive questions (Kays et al. 2012, Langhaug et al. 2010, de Leeuw et al. 2003, Wood et al. 2006). Of course, this may not completely solve the problem. Schmiedeberg and Müller (2020) examine that issue for the pairfam. The questionnaire provides the category "I do not want to answer this." The authors report that 7.9% chose this category when answering the question on sexual satisfaction. 10.3% chose the category when answering the question on frequency of sex. The refusal to answer questions on sexuality depends

The first wave of interviews was conducted in the year 2008 for three birth cohorts: adolescents born between 1991 and 1993, young adults between 1981 and 1983, and middle-aged adults born between 1971 and 1973. Addresses were randomly drawn from the local population registers of 343 randomly chosen municipalities. More than 12,000 persons participated in the first wave. The sample of the first wave has been used as the basis for the following waves. Nonresponse patterns are similar to other panel studies based on voluntary participation. Bias due to panel attrition does not appear to be a large issue (Müller and Castiglioni 2015).

Information on the Big Five is available for the years 2009, 2013, and 2017. For the empirical analysis, we always use data from those waves for which information on both the Big Five and the respective dependent variable is available. We limit our sample to heterosexual persons who are at least 18 years old and have a partner in the respective year of observation. The average age in our estimation sample is 33 years.

3.2 Dependent variables

Table 1 shows the definitions of the dependent variables and their descriptive statistics.[5] The table also reports the years for which information on the Big Five and the respective dependent variable is available. An ordered variable for sexual satisfaction captures the utility a person derives from sex. The 11-point Likert scale of the variable ranges from 0 "very dissatisfied" to 10 "very satisfied." The regressions with this dependent variable are based on data from the years 2009, 2013, and 2017.

Our theoretical background discussion suggests personality influences a person's behavior in a sexual relationship and, hence, also the partner's sexual satisfaction. Thus, in order to examine the influence of personality traits on the partner's sexual fulfillment, we consider two ordered variables for the self-assessment of whether the interviewee perceives his- or herself as being a good sex partner and being able to fulfill the partner's needs and desires. The 5-point Likert scale of these variables ranges from 1 "not at all" to 5 "absolutely." The estimations are based on data from the year 2009.

As discussed in our theoretical background section, sexual communication is one transmission channel through which a person's personality traits can influence sexual satisfaction. In order to get insights into this transmission channel, we use 5-point Likert scale variables for expressing preferences during sex and expressing sexual needs and desires in general. The estimations with these dependent variables are based on the year 2009.

As the frequency of intercourse plays an important role in sexual well-being, we also examine the link between personality and this dimension of sexuality. We use information from waves 2009, 2013, and 2017. Frequency of intercourse during the

---

Footnote 4 (continued)

on aging processes, parenthood, and relationship status. In particular, persons *without* a partner have a higher likelihood of refusal. Note that we focus on persons *with* a partner and control, among others, for age, children, and relationship status in our regressions.

[5] Tables 8, 9, and 10 in the Appendix show the distribution of the dependent variables.

Table 1 Definitions and descriptive statistics of the dependent variables

Variable	Definition	Mean	Std.dev	Number	Years
Sexual satisfaction	Score of sexual satisfaction. The interviewee answers the question "How satisfied are you with your sex life?" on an 11-point Likert scale. The scale ranges from 0 "very dissatisfied" to 10 "very satisfied."	6.577	2.507	10,830	2009, 2013, 2017
Good sex partner	The interviewee responds to the statement "I am a very good sex partner" on a 5-point Likert scale ranging from 1 "not at all" to 5 "absolutely."	3.758	0.882	1728	2009
Fulfilling partner's sexual needs and desires	The interviewee responds to the statement "In general, I can fulfill the sexual needs and desires of my partner very well" on a 5-point Likert scale ranging from 1 "not at all" to 5 "absolutely."	3.904	0.868	1785	2009
Expressing preferences during sex	The interviewee responds to the statement "If I want something different during sex, I say it or show it" on a 5-point Likert scale ranging from 1 "not at all" to 5 "absolutely."	3.946	0.937	1818	2009
Expressing sexual needs and desires in general	The interviewee responds to the statement "In general, I can express my sexual needs and desires very well" on a 5-point Likert scale ranging from 1 "not at all" to 5 "absolutely."	3.885	0.908	1813	2009
Frequency of sex	Frequency of intercourse per month during the past 3 months: 0, 0.67, 2.5, 4, 10, 20, or 30 days per month	5.772	6.044	10,329	2009, 2013, 2017
Desire for much less frequent sex	Dummy equals 1 if the person prefers to have sex much less often than he or she had during the past 3 months	0.006	0.077	2880	2017
Desire for somewhat less frequent sex	Dummy equals 1 if the person prefers to have sex somewhat less often than he or she had during the past 3 months	0.041	0.198	2880	2017
Desire for somewhat more frequent sex	Dummy equals 1 if the person prefers to have sex somewhat more often than he or she had during the past 3 months	0.467	0.499	2880	2017
Desire for much more frequent sex	Dummy equals 1 if the person prefers to have sex much more often than he or she had during the past 3 months	0.115	0.319	2880	2017
Extradyadic affair	Dummy equals 1 if the person had sex with someone other than the partner during the past 2 years	0.031	0.172	6528	2010, 2014

past 3 months is measured on a 7-point interval scale: never/not in the past 3 months, once per month or less, 2–3 days per month, once per week, 2–3 days per week, more than 3 days per week, and daily. Building from Schröder and Schmiedeberg (2015), we recode the variable to indicate frequency per month: 0, 0.67, 2.5, 4, 10, 20, and 30 days per month. This allows to apply a linear regression analysis. Nonetheless, as a robustness check, we will additionally provide an interval regression.

The survey also provides information on the desired frequency of intercourse. Interviewees answer the question on whether they prefer to have less or more sex than they had during the past 3 months. The categories for the answers are as follows: much less often, somewhat less often, just as often, somewhat more often, and much more often. The analysis of the desired frequency of intercourse is based on the 2017 wave.

Finally, our theoretical discussion suggests that personality has an influence on the person's commitment to the partner. In order to examine this aspect empirically, we consider extradyadic sexual relationships as an inverse indicator of commitment. The survey provides information on extradyadic affairs during the past 2 years. Interviewees choose between four answers: (1) no extradyadic affairs of both partners, (2) extradyadic affair of the partner only, (3) extradyadic affair of the interviewee only, and (4) extradyadic affairs of both partners. Of course, while a person knows whether he or she had extradyadic affairs, the person may not be aware of the extradyadic affairs of the partner. Thus, we focus our analysis on the person's own extradyadic affairs. We define a dummy equal to 1 if the interviewee reports that he or she only or both partners had an extradyadic affair during the past 2 years. For this variable, it is irrelevant whether or not the person is aware of the possible affairs of the partner. For example, consider a situation in which both the person and the partner had extradyadic affairs. If the person is aware of the partner's affairs, he or she will respond with category 4, and the dummy for own extradyadic affairs equals 1. If the person is not aware of the partner's affairs, he or she will respond with category 3, and the dummy for own affairs still correctly equals 1. We use the information provided in waves 2010 and 2014. For the explanatory variables, we use a 1-year lag in the regressions.[6]

3.3 Key explanatory variables: Big Five personality traits

Table 2 shows the definitions and descriptive statistics of the variables for the Big Five personality traits. As usual in large surveys (Rammstedt and John 2005, 2007; Soto and John 2017), personality is measured in the pairfam using a short version of the Big Five Inventory. Extraversion, conscientiousness, agreeableness, and neuroticism are assessed with four items. Openness to experience is assessed with five items. The items are measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." For each of the five personality traits, we add up the respective items and divide the sum by the number of items.

---

[6] We use a 1-year lag instead of a 2-year lag to avoid losing too many observations.

Table 2 Definitions and descriptive statistics of the variables for the Big Five

Variable	Definition	Mean	Std.dev
Extraversion	Score of extraversion constructed from adding up four survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I am usually modest and reserved, (2) I get enthusiastic easily and can motivate others easily, (3) I tend to be the strong and silent type, and (4) I am expansive and gregarious. Items 1 and 3 were recoded in inverse order before adding up	3.554	0.802
Openness	Score of openness to experience constructed from adding up five survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 5. The items are as follows: (1) I am interested in many kinds of things, (2) I am intellectual and like to contemplate things, (3) I am very imaginative, (4) I appreciate artistic and esthetic impressions, and (5) I am hardly interested in art. Item 5 was recoded in reverse order before adding up	3.620	0.684
Conscientiousness	Score of conscientiousness constructed from adding up four survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I complete my tasks thoroughly, (2) I make things comfortable for myself and tend to be lazy, (3) I am proficient and work fast, and (4) I make plans and carry them out. Item 2 was recoded in inverse order before adding up	3.882	0.598
Agreeableness	Score of agreeableness constructed from adding up four survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I tend to criticize others, (2) I trust others easily and believe that people are inherently good, (3) I can be cold and distanced in my behavior, and (4) I can be gruff and dismissive with others. Items 1, 3, and 4 were recoded in inverse order before adding up	3.292	0.700
Neuroticism	Score of neuroticism constructed from adding up four survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I easily become depressed or discouraged, (2) I am relaxed and do not let myself be worried by stress, (3) I worry a lot, and (4) I easily become nervous and insecure. Item 2 was recoded in reverse order before adding up	2.661	0.786

$N = 10,830$. The descriptive statistics are based on the estimation sample for sexual satisfaction with the pooled waves 2009, 2013, and 2017

Psychologists often assume that the Big Five change only modestly after they have developed in childhood and adolescence (Costa et al. 2000). Some even emphasize an important genetic component contributing to a relatively high stability of personality (Bouchard and Loehlin 2001; Kandler et al. 2010). The question of the stability of the Big Five has also been of interest to economists. Cobb-Clark and Schurer (2012) demonstrate for working-age adults in Australia that mean level changes of the Big Five personality traits are very small over a 4-year period. Considering an 8-year time frame, Elkins et al. (2017) find somewhat higher, but generally small changes even for adolescents and young adults. Anger et al. (2017) confirm for working individuals in Germany that the mean level changes of the Big Five are small over an 8-year period.

As the pairfam provides information on the Big Five for the years 2009, 2013, and 2017, we can examine the stability of the Big Five also with our data. Appendix Table 11 shows that the mean level changes of the Big Five personality traits for the periods 2009/2013, 2013/2017, and 2009/2017 are small. The table also reports Cohen's d. This measure defines the mean level change in terms of a standard deviation change of the respective trait. All values for Cohen's d amount to less than 0.2 implying that the changes can be considered very small.

Altogether, a series of studies suggest that while not literally fixed, the Big Five personality traits exhibit relatively high stability. However, there is an ongoing debate as to the role of age and major life events in intra-individual changes of personality. Specht et al. (2011) find that age has an influence throughout the life span and provide some evidence of a curvilinear influence. The evidence on the role of major life events appears to be mixed. While some studies indicate some moderate and rather specific influences of single life events (Angeli et al. 2018; Anger et al. 2017), others conclude that intra-individual changes are generally only weakly or even not related to major life events and that changes are not economically meaningful (Costa et al. 2000; Cobb-Clark and Schurer 2012). Moreover, Specht et al. (2011) suggest that there can also be reverse causation with personality influencing life events.

Whatever the exact role of life events may be, our dataset allows us to include a rich set of control variables capturing demographic, economic, and family-related factors. This should mitigate endogeneity concerns. We follow most of the studies on personality (e.g., Caliendo et al. 2014; Cobb-Clark and Tan 2011; Mueller and Plug 2006; Risse et al. 2018) and consider personality traits with suitable caution as exogenous. While the regressions may not allow definite causal inferences to be drawn, they provide a crucial first step to bring important new insights to family economics which can be interpreted in light of our theoretical considerations.

3.4 Control variables

Appendix Table 12 provides the definitions and descriptive statistics of the control variables. We control for the economic situation by including variables for the years of schooling and the person's labor market status. A variable for health satisfaction accounts for overall health status. Demographic characteristics are captured by

variables for the number of children, the presence of a baby in the household and for the person's gender, religious affiliation, migration background, and age. In order to account for a nonlinear influence of age on sexuality, we also include a quadratic and a cubic age variable. The type of relationship is controlled for by variables for relationship duration and being married to the partner. For persons not married to the partner, we take into account whether or not the couple lives together in the same dwelling. We also include a variable for the number of previous marriages (and, hence, the number of previous divorces). Moreover, as East Germans appear to have more equal gender roles than West Germans, we control for residing in East Germany.[7] Finally, cohort dummies are included. In regressions with more than one wave of the data, we also control for the year of observation.

4 Empirical analysis

4.1 Own sexual satisfaction and satisfying the partner's sexual wishes

In the regressions, we standardize the Big Five variables to have a mean of 0 and a standard deviation of 1. This allows a straightforward interpretation of the results. The influence of a personality trait can be interpreted in terms of a one standard deviation change in the score for this trait.

Column 1 of Table 3 shows the key results on own sexual satisfaction.[8] The determinants of sexual satisfaction are estimated by using the random effects ordered logit model.[9] The random effects model accounts for the cross-period correlation of individual-specific error terms. Furthermore, we cluster the standard errors at the individual level using the Huber-White sandwich estimator. All of the five personality variables take significant coefficients. Extraversion, openness to experience,

---

[7] See, for example, Jirjahn and Chadi (2020) for a discussion of gender roles in East and West Germany.

[8] Control variables are included in the regressions, but are suppressed to save space. Full results are available from the authors upon request.

[9] We prefer the random effects (RE) over a fixed effects (FE) model. The FE model only accounts for within variation of variables but throws away all the information contained in the cross-sectional variation in the data. Thus, time-invariant variables cannot be included. While variables with small variation across time may be included, this can result in highly inefficient estimates. Attenuation bias due to measurement errors is also likely to be more severe in FE regressions (Swaffield 2001). Finally, while the FE model solves the problem of unobserved time-invariant influences, it can aggravate a possible bias due to the omitted time-varying variables because dropping the between variation increases the influence of time-varying misspecification on parameter estimates (Plümper and Troeger 2019). A potential shortcoming of the RE model is the requirement that the random effects are uncorrelated with the explanatory variables. However, Clark and Linzer (2015) provide Monte Carlo simulations showing that the RE model may be preferred even if this requirement is violated. As long as the correlation between random effects and explanatory variables is not too high and, hence, the resulting bias is small enough, the lower variance of the RE estimator produces root mean square errors below those of the FE estimator. This advantage is particularly strong in regressions including variables with small within variation. Moreover, note that comparisons of RE and FE models are often made under the assumption that both include the same explanatory variables. Yet, the RE model allows to control for time-invariant factors reducing the risk that the random effects are correlated with the explanatory variables.

Table 3 Determinants of sexual satisfaction and satisfying the partner's sexual wishes

Explanatory variables	Own sexual satisfaction (random effects ordered logit) (1)	Being a good sex partner (ordered logit) (2)	Fulfilling partner's sexual needs and desires (ordered logit) (3)
Extraversion	0.054*	0.195***	0.201***
	(1.943)	(3.428)	(3.784)
	[0.010]	[0.040]	[0.035]
Openness	0.098***	0.182***	0.249***
	(3.718)	(3.546)	(4.893)
	[0.020]	[0.037]	[0.044]
Conscientiousness	0.222***	0.305***	0.350***
	(8.115)	(5.501)	(6.358)
	[0.045]	[0.063]	[0.062]
Agreeableness	0.139***	−0.037	−0.015
	(5.398)	(0.736)	(0.316)
	[0.028]	[−0.007]	[−0.002]
Neuroticism	−0.326***	−0.228***	−0.248***
	(11.326)	(4.015)	(4.334)
	[−0.066]	[−0.047]	[−0.043]
Log likelihood	−22,718.790	−2065.454	−2060.831
Number of persons	6240	1728	1785
Number of observations	10,830	1728	1785

Control variables are included in all regressions but are suppressed to save space. The Big Five variables are standardized. The table shows the estimated coefficients. Z-statistics are in parentheses. For the random effects ordered logit, standard errors are clustered at the person level. Average marginal effects are in square brackets. In column 1, marginal effects are calculated on the probability of answering one of the three highest satisfaction categories of the 11-point Likert scale. In columns 2 and 3, marginal effects are calculated on the probability of answering one of the two highest categories of the 5-point Likert scale

*$p < 0.1$; ***$p < 0.01$

conscientiousness, and agreeableness are significantly positive determinants of sexual satisfaction while neuroticism is a significantly negative determinant. The results are not only statistically significant, but also quantitatively meaningful. A one standard deviation increase in the neuroticism score is associated with a 7 percentage point lower likelihood of reporting one of the three highest categories of the 11-point Likert scale for sexual satisfaction. Given that we have 43% of observations in these categories, this implies a decrease of 16%. A one standard deviation increase on the scale for conscientiousness increases the likelihood of reporting one of the three highest satisfaction categories by about 5 percentage points. Taking again into account that there are 43% of observations in these categories, this implies an increase of 12%. The marginal effects of agreeableness, openness, and extraversion are 3, 2, and 1 percentage points, respectively.

As suggested by our theoretical considerations, a person's personality traits may not only influence his or her own sexual satisfaction, but also the partner's sexual satisfaction. In order to examine the influence of a person's personality on the partner's sexual satisfaction, we use interviewees' self-assessments and estimate the determinants of

being a good sex partner and fulfilling the partner's sexual needs and desires. Columns 2 and 3 provide the key results of the ordered logit regressions. The estimations show no significant association between agreeableness and the two indicators of the partner's sexual satisfaction. Extraversion, openness to experience, and conscientiousness are significantly positive determinants of being a good sex partner and fulfilling the partner's sexual needs and desires. Neuroticism is a significantly negative determinant. These influences are also quantitatively meaningful. For example, a one standard deviation increase on the scale for conscientiousness is associated with a 6 percentage point higher likelihood of reporting one of the two highest categories of the 5-point scale for being a good sex partner. Given that we have 64% of observations in the two highest categories, this implies an increase in the likelihood by 9%.

4.2 Sexual communication

In order to examine possible transmission channels, we now turn to the link between personality traits and sexual communication. Table 4 presents the key results of ordered logit regressions on the determinants of expressing preferences during sex and expressing sexual needs and desires in general. Extraversion, openness to experience, and conscientiousness are positive determinants of the two indicators of sexual communication whereas agreeableness and neuroticism are negative determinants. Again, the influences are not only statistically significant, but also quantitatively meaningful. For example, a one standard deviation increase in the extraversion score is associated with a 5 percentage point higher likelihood of reporting one of the two highest categories of the 5-point scale for expressing preferences during sex. Given that we have 73% of observations in the two highest categories, this implies an increase in the likelihood by 7%.

4.3 Frequency of sex

Previous research has shown that the frequency of sex plays a role in happiness (Blanchflower and Oswald 2004; Cheng and Smyth 2015; Schmiedeberg et al. 2017). This gives rise to the question of how personality traits influence the frequency of sex. Table 5 shows the key results of a random effects GLS regression on the determinants of frequency of intercourse per month. As a check of robustness, we also present a random effects interval regression using the initial categories for the frequency of sex. For the interval regression, we translated the interval boundaries shown in Appendix Table 10 into the frequency of intercourse per month.

The interval regression and the linear regression on the midpoints of the intervals yield very similar results. While the variable for agreeableness does not take a significant coefficient, the other four personality traits emerge as significant determinants. Extraversion, openness to experience, and conscientiousness are positively associated with the frequency of intercourse. Neuroticism is negatively linked to the frequency of intercourse. To provide a quantitative illustration, a one standard increase in the neuroticism score implies a decrease in the monthly frequency of intercourse by almost half a day. Taking

Table 4 Determinants of sexual communication

Explanatory variables	Expressing preferences during sex (1)	Expressing sexual needs and desires in general (2)
Extraversion	0.303***	0.240***
	(5.750)	(4.466)
	[0.054]	[0.044]
Openness	0.242***	0.275***
	(4.597)	(5.414)
	[0.043]	[0.051]
Conscientiousness	0.296***	0.276***
	(5.753)	(5.132)
	[0.053]	[0.051]
Agreeableness	−0.155***	−0.113**
	(3.099)	(2.297)
	[−0.027]	[−0.020]
Neuroticism	−0.185***	−0.295***
	(3.289)	(5.075)
	[−0.033]	[−0.054]
Log likelihood	−2211.794	−2170.143
Number of observations	1818	1813

Control variables are included in all regressions but are suppressed to save space. The Big Five variables are standardized. Method: ordered logit. The table shows the estimated coefficients. Z-statistics are in parentheses. Average marginal effects in square brackets are calculated on the probability of answering one of the two highest categories of the 5-point Likert scale

**p < 0.05; ***p < 0.01

into account that the average frequency is about 6 days per month, this is an 8 percentage decrease in the frequency of intercourse.

So far, we have considered the actual frequency of sex. We recognize that the desired frequency of sex may differ from the actual one (Loewenstein et al. 2015; Smith et al. 2011). Thus, using a multinomial logit approach, we estimate the determinants of desiring much less frequent, somewhat less frequent, somewhat more frequent, or much more frequent sex. The reference group consists of persons who are satisfied with the actual frequency of intercourse. Table 6 provides the key results. Only a few of the results are significant. Extraversion is significantly associated with a higher likelihood of desiring much more frequent sex. Conscientiousness is significantly linked with a lower probability of desiring much less frequent sex. Neuroticism is significantly associated with both a higher likelihood of desiring much less frequent sex and a higher likelihood of desiring somewhat more and much more frequent sex. The estimations show no significant influence of agreeableness and openness.

Table 5 Determinants of frequency of intercourse

Explanatory variables	Random effects GLS (1)	Random effects interval regression (2)
Extraversion	0.276***	0.276***
	(4.130)	(4.094)
Openness	0.124*	0.118*
	(1.893)	(1.845)
Conscientiousness	0.134**	0.144**
	(1.982)	(2.267)
Agreeableness	−0.045	−0.047
	(0.674)	(0.769)
Neuroticism	−0.459***	−0.486***
	(6.744)	(7.181)
R^2	0.136	—-
Log-likelihood	—-	−28,080.504
Number of persons	5989	5989
Number of observations	10,329	10,329

Control variables are included in all regressions but are suppressed to save space. The Big Five variables are standardized. The table shows the estimated coefficients. Z-statistics are in parentheses. For the random effects GLS regression, standard errors are clustered at the person level. Clustering is not available in Stata for the random effects interval regression

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

4.4 Extradyadic affairs

Finally, we examine the role of personality traits in having extradyadic affairs during the last 2 years. This gives insights into how personality influences a person's commitment to the partner. Table 7 shows the key results of a random effects logit estimation. Since the share of observations with extradyadic affairs is at 3% relatively low, the table also presents Firth's logit estimation as a robustness check.[10] The random effects regression and Firth's model yield very similar results. While openness to experience does not emerge as a significant determinant, the variables for the other four personality traits take significant coefficients. While extraversion and neuroticism are significantly positive determinants of extradyadic affairs, conscientiousness and agreeableness are significantly negative determinants. For a quantitative illustration, let us consider a one standard deviation increase on the scale for conscientiousness. This increase is associated with a 0.7 percentage point lower likelihood of having extradyadic

---

[10] Note that the low share of observations with extradyadic affairs is due to the relatively short 2-year window. Studies using short windows report a much lower share of extradyadic affairs (Potter 2011, Smith 2012) than studies using longer windows (Adamopoulou 2013, Fair 1978).

Table 6 Determinants of desire for less frequent or more frequent sex

Explanatory variables	Much less frequent sex	Somewhat less frequent sex	Somewhat more frequent sex	Much more frequent sex
Extraversion	0.201	−0.158	0.013	0.147**
	(0.606)	(1.381)	(0.285)	(1.976)
	[0.001]	[−0.006]	[−0.002]	[0.013]
Openness	0.150	−0.137	0.001	0.117
	(0.590)	(1.311)	(0.024)	(1.572)
	[0.0007]	[−0.005]	[−0.004]	[0.011]
Conscientiousness	−0.639**	−0.043	−0.006	−0.107
	(2.438)	(0.400)	(0.127)	(1.467)
	[−0.003]	[−0.0009]	[0.006]	[−0.009]
Agreeableness	−0.127	−0.095	0.018	−0.018
	(0.624)	(0.811)	(0.392)	(0.259)
	[−0.0006]	[−0.003]	[0.007]	[−0.002]
Neuroticism	0.570*	0.024	0.125**	0.246***
	(1.842)	(0.218)	(2.498)	(3.154)
	[0.002]	[−0.002]	[0.014]	[0.016]
Log-likelihood	−3031.793			
Number of observations	2880			

Control variables are included in all regressions but are suppressed to save space. The Big Five variables are standardized. Method: multinomial logit. The reference group consists of persons who prefer to have sex just as often as they had during the past 3 months. The table shows the estimated coefficients. Z-statistics are in parentheses. The average marginal effects are in square brackets

*$p<0.1$; **$p<0.05$; ***$p<0.01$

affairs. Given that there are 3% of observations with extradyadic affairs, this implies a change in the likelihood by about 23%.

4.5 Further estimations

We performed a series of further estimations to check the robustness of the results.[11] One robustness check focused on the minimum age of persons in our estimation sample. The findings presented in this study are based on an estimation sample of persons who are at least 18 years old. One may ask if the results are influenced by younger persons whose personalities might still be forming. Thus, as a robustness check, we excluded younger persons and ran the regressions only for those who are at least 25 years old. This exercise yielded a very similar pattern of key results.

We also experimented with alternative specifications of the regressions to check the robustness of the results. We ran the regressions without controls for the presence of a baby, number of previous marriages, and duration of the relationship. Exclusion of these controls did not change the key results.

---

[11] The results are available from the authors upon request.

Table 7 Determinants of extradyadic affairs

Explanatory variables	(1) Random effects logit	(2) Firth's logit
Extraversion	0.354*** (2.917) [0.007]	0.253*** (3.043)
Openness	0.143 (1.171) [0.003]	0.099 (1.291)
Conscientiousness	−0.363*** (3.294) [−0.007]	−0.262*** (3.553)
Agreeableness	−0.293*** (2.700) [−0.006]	−0.217*** (2.868)
Neuroticism	0.273** (2.266) [0.005]	0.212** (2.545)
Pseudo-R^2	0.048	0.001
Number of persons	4762	4762
Number of observations	6528	6528

Control variables are included in all regressions but are suppressed to save space. The Big Five variables are standardized. The table shows the estimated coefficients. Z-statistics are in parentheses. For the random effects logit, standard errors are clustered at the person level. The average marginal effects are in square brackets. Clustering and marginal effects are not available in Stata for Firth's logit

**p < 0.05; ***p < 0.01

Furthermore, in order to mitigate the remaining endogeneity concerns, we used 4-year lags of the Big Five personality traits in our main regression on sexual satisfaction. This implied that we lost one wave of observations so the estimation was based on panel data from the years 2013 and 2017; i.e., sexuality in 2013 was explained by personality traits in 2009 and sexuality in 2017 by personality traits in 2013. The controls were still taken from the respective actual year. This exercise confirmed a significantly negative influence of neuroticism and significantly positive influences of openness, conscientiousness, and agreeableness on sexual satisfaction. However, the coefficient on extraversion was less precisely estimated. This was likely due to the substantially lower number of observations.

We also used our main regression on sexual satisfaction to examine the issue of item nonresponse in more detail. Item nonresponse might lead to a non-randomly selected estimation sample. A non-randomly selected sample, in turn, can result in biased estimates if there are unobserved factors influencing both a person's sexuality and his or her propensity to answer the corresponding question. To account for such unobserved factors, we used Heckman's two-stage sample selection correction. In the first stage, we used a probit regression to estimate the determinants of answering the question on sexual satisfaction. The probit results were used to calculate the inverse Mills ratio. In the second stage, the inverse Mills ratio was included as an additional explanatory variable in the satisfaction regression. To avoid that

identification relies solely on the inherent nonlinearity of Heckman's approach, we imposed an additional exclusion restriction. The first-stage probit, but not the second-stage regression, included a variable for the interviewee's expressed willingness to participate in future waves of the survey. Moreover, we also excluded some controls from the second-stage regression which did not emerge as significant determinants of sexual satisfaction. The inverse Mills ratio did not take a significant coefficient in the satisfaction regression. Most importantly, including the inverse Mills ratio did not change the key results in the satisfaction regression. Thus, the key results persisted even when correcting for possible sample selection due to item nonresponse.

Furthermore, we examined whether the link between personality and sexuality is heterogeneous and depends on circumstances. In particular, we examined if the influence of personality on sexuality depends on the duration of the relationship. A longer duration of the relationship means that the partners have more experience with each other and may indicate that the relationship becomes more serious. In order to examine the moderating role of relationship duration, we added interaction terms of relationship duration with the Big Five to the regressions. While this exercise also confirmed our key pattern of results, we additionally found some significant interactions with conscientiousness and neuroticism. The positive influence of conscientiousness on sexual communication, fulfillment of the partner's sexual wishes, and frequency of intercourse is increasing with the duration of the relationship. The negative influence of neuroticism on own sexual satisfaction, sexual communication, and frequency of intercourse is decreasing with relationship duration.

Finally, note that our study focuses on persons who have a partner. This reflects our interest in the role personality plays in romantic relationships. Of course, personality can also have a role in the sex life of singles since singles may engage in casual sex. Thus, as a check of robustness, we added singles to our estimation sample. We expanded the specification of the regressions by including a dummy for singles and variables for the interaction of this dummy with the Big Five personality traits. This exercise also confirmed our key results. Moreover, it showed that extraversion plays an even stronger role for singles in sexual satisfaction, fulfilling the partner's sexual wishes, sexual communication, and frequency of sex.

5 Discussion of results

Our results show that the Big Five personality traits play an important role in the sex life of people. The Big Five personality traits not only play a role in a person's sexual satisfaction. They also play a role in how the person behaves in a sexual relationship. This conforms to our theoretical considerations suggesting that personality traits influence sexual communication and information sharing, the way dissonant sexual preferences of the partners are handled, and the extent to which the person is committed to promises made to the partner.

Neuroticism is associated with lower sexual satisfaction. On the one hand, a higher degree of emotional instability may entail that a person derives less utility from sex as he or she fears sex or is disgusted about some aspects of sexuality. On the other hand, our results suggest that a higher degree of emotional instability negatively affects sexual

satisfaction through the person's behavior in the sexual relationship. Neuroticism is negatively associated with (the self-assessment of) being a good sex partner and fulfilling the partner's sexual needs and desires. This indicates that a person's emotional instability also negatively affects the partner's sexual satisfaction and makes a mutually beneficial sex life less likely. Our findings on sexual communication corroborate this view. Neuroticism is negatively associated with expressing preferences during sex and the ability of expressing sexual needs and desires in general. This conforms to the notion that emotional instability entails inadequate and hostile sexual communication and information sharing. Furthermore, neuroticism is associated with a lower frequency of sex and a lower likelihood of being satisfied with the actual frequency of sex. Interestingly, a higher degree of neuroticism increases both the likelihood of desiring less frequent and the likelihood of desiring more frequent sex. This indicates that a neurotic person has rather volatile sexual preferences and is driven by impulsivity. Hence, it is more difficult for the person and the partner to coordinate their preferences and to handle dissonant preferences. Finally, our estimations show that neuroticism is associated with an increased likelihood of having extradyadic affairs. This conforms to the notion that lower self-control and a higher discounting of the future entail more severe commitment problems.

Conscientiousness is associated with higher sexual satisfaction. Moreover, it is also positively associated with being a good sex partner and fulfilling the partner's sexual needs and desires. Thus, our findings fit the notion that a higher degree of conscientiousness helps realize a win–win situation within the sexual relationship. As suggested by our theoretical considerations, conscientiousness may contribute to a more balanced style of sexual communication, a more fair-minded and cooperative handling of dissonant sexual preferences, and a higher commitment to promises made to the partner. Indeed, our empirical results confirm a positive role of conscientiousness in sexual communication. Conscientiousness is positively associated with expressing preferences during sex and expressing sexual needs and desires in general. Moreover, our results provide evidence that conscientiousness has a commitment value in a sexual relationship. Conscientiousness is associated with a lower likelihood of having extradyadic affairs.

Agreeableness is also associated with higher sexual satisfaction. However, our estimations provide no evidence that improved sexual communication is a transmission channel. Quite the contrary, we find evidence of a negative role of agreeableness in sexual communication. Agreeableness is negatively associated with expressing preferences during sex and expressing sexual needs and desires in general. As suggested by our theoretical considerations, there can be two opposing influences. On the one hand, agreeableness may contribute to a more harmonious and empathic style of communication. On the other hand, a stronger desire for harmony and a higher degree of altruism may imply that an agreeable person to some extent sacrifices his or her personal needs. Our empirical results on sexual communication suggest that the latter influence dominates. The interesting point is that an agreeable person nonetheless experiences higher sexual satisfaction. This may be explained by a higher degree of humility implying that an agreeable person gains sexual satisfaction even if he or she sacrifices some of his or her needs. Furthermore, our estimations show that agreeableness is associated with a lower likelihood of having extradyadic affairs. This suggests that agreeableness has a commitment value.

Extraversion is associated with both higher sexual satisfaction and higher frequency of sex. Moreover, it is a positive determinant of being a good sex partner and fulfilling the partner's sexual needs and desires. Thus, extraversion appears to contribute to a mutually beneficial sex life of the person and the partner. Our results suggest that improved sexual communication is one transmission channel. Extraversion is positively associated with expressing preferences during sex and the ability of expressing sexual needs and desires in general. However, extraversion is also associated with a higher likelihood of having extradyadic affairs. Thus, while a person's extraversion contributes to a mutually beneficial sex life of the couple, at the same time, it appears to entail more severe commitment problems. The positive link between extraversion and extradyadic affairs also indicates that a more extroverted person has better outside options increasing his or her bargaining power within the sexual relationship. A stronger bargaining power enables a more extroverted person to get through his or her preferred sexual practices. Altogether, our results conform to the notion that a person's extraversion increases both the joint surplus generated by a couple's sexual relationship and the person's share in this surplus.

We also find evidence that openness to experience is positively associated with sexual satisfaction and frequency of intercourse. Furthermore, our estimations provide evidence that openness to experience is a positive determinant of being a good sex partner and fulfilling the partner's sexual needs and desires. This suggests that an open person is more able to take into account the partner's sexual preferences. Our results also show that openness to experience contributes to improved sexual communication. It is positively associated with expressing preferences during sex and the ability of expressing sexual needs and desires in general. This indicates that a person who is more open to the partner's sexual preferences has better opportunities to communicate his or her preferences to the partner. In contrast to extraversion, we find no evidence that openness to experience is associated with extradyadic affairs. Thus, our analysis provides no evidence that openness to experience has an influence on commitment problems or the person's outside options.

6 Conclusions

In this study, we have developed an economics-based approach to the role personality plays in people's sex life. Personality not only shapes a person's preferences for sex. It also shapes a person's behavior in a sexual relationship. This behavior has an influence on the quality and quantity of sex and, hence, on the sexual well-being of the person and his or her partner. Personality shapes sexual communication and information sharing, the way dissonant sexual preferences of the partners are handled, and the extent to which the person is committed to promises made to their partner.

Using a large representative dataset from Germany, our empirical results confirm that personality plays an important role in various dimensions of sexuality. The Big Five personality traits have an influence on own sexual satisfaction, sexual fulfillment of the partner, sexual communication, actual and desired frequency of sex, and extradyadic affairs. In summary, conscientiousness contributes to a mutually beneficial sex life and increases the person's commitment to the partner. The opposite holds true for neuroticism. Neuroticism not only decreases the person's and

the partner's sexual well-being. It is also associated with a lower commitment to the partner. While extraversion and openness to experience help realize a mutually beneficial sex life, we find no evidence that they have a commitment value. Quite the contrary, the estimations suggest that extraversion is associated with lower commitment to the partner. Agreeableness is associated with a higher commitment. However, it appears to make people more reluctant to express their sexual needs and desires.

We recognize the need for future research within this theme. Economists have been increasingly interested in the determinants of life satisfaction. Against this background, a small number of econometric studies have examined the link between sex and happiness. Future research could fruitfully examine if this link depends on personality traits. Personality may not only influence the quality and quantity of sex but may also moderate how sex translates into life satisfaction. Furthermore, comparative analyses could be a fruitful avenue for future research. Future studies could systematically examine the relationship between personality and sex for different cultures, countries, and societies. Finally, on a broader scale, our study suggests that giving sex and personality a more prominent role in family economics could lead to interesting theoretical and empirical advancements in this field. For example, it would be interesting to examine the influence of sexuality on family formation and dissolution.

Appendix

Table 8 Distribution of sexual satisfaction

Scale of sexual satisfaction	Share of observations (in %)
0 (very dissatisfied)	2.25
1	2.04
2	4.04
3	5.69
4	5.41
5	11.12
6	9.66
7	17.25
8	19.38
9	12.09
10 (very satisfied)	11.07

$N = 10,830$

Table 9 Distribution of sexual communication and satisfying the partner's sexual wishes

Scale	Share of observations (in %)			
	Good sex partner	Fulfilling partner's sexual needs and desires	Expressing preferences during sex	Expressing sexual needs and desires in general
1 (not at all)	1.1	1.01	1.43	1.05
2	6.02	5.6	6.38	6.78
3	29.28	20.11	19.03	20.96
4	43.17	48.57	42.52	45.01
5 (absolutely)	20.43	24.71	30.64	26.2
N	1728	1785	1818	1813

Table 10 Distribution of frequency of sex

Intervals of frequency of sex	Share of observations (in %)
No sex	7.54
Once a month	13.76
2–3 days a month	22.99
Once a week	24.45
2–3 days a week	22.82
3 or more days a week (but not daily)	6.87
Daily	1.57

$N = 10,329$

Table 11 Changes in personality over time

Personality trait	Change between 2009 and 2013		Change between 2013 and 2017		Change between 2009 and 2017	
	Mean	Cohen's d	Mean	Cohen's d	Mean	Cohen's d
Extraversion	− 0.091	− 0.113	− 0.003	− 0.004	− 0.095	− 0.115
Openness	− 0.130	− 0.192	− 0.004	− 0.005	− 0.134	− 0.191
Conscientiousness	− 0.066	− 0.114	− 0.004	− 0.006	− 0.069	− 0.120
Agreeableness	0.037	0.054	− 0.085	− 0.125	− 0.049	− 0.071
Neuroticism	0.024	0.032	0.008	0.010	0.032	0.041

$N = 1333$. The calculations are based on the estimation sample of the regression on sexual satisfaction and persons who participated in the survey in all 3 years. Cohen's d is the mean level change divided by the pooled standard deviation

Table 12 Definitions and descriptive statistics of the control variables

Variable	Definition	Mean	Std.dev
Enrolment in education	Dummy equals 1 if the person is enrolled in education	0.171	0.377
Full-time	Dummy equals 1 if the person is employed full-time	0.446	0.497
Part-time	Dummy equals 1 if the person is employed part-time	0.150	0.357
Self-employed	Dummy equals 1 if the person is self-employed	0.060	0.237
Irregular employment	Dummy equals 1 if the person has an irregular job (e.g., internship, occasional job, mini job)	0.035	0.184
East Germany	Dummy equals 1 if the person resides in East Germany	0.261	0.439
Female	Dummy equals 1 if the person is a woman	0.558	0.497
Migration background	Dummy equals 1 if the person is a first or second generation immigrant	0.183	0.387
Number of children	Number of children living with the person in the same household	1.070	1.116
Baby	Dummy equals 1 if a child younger than 13 months lives with the person in the same household	0.064	0.244
Education	Years of schooling	13.170	3.361
Married	Dummy equals 1 if the person is married to his or her partner	0.537	0.499
Cohabiting	Dummy equals 1 if the person is not married to the partner and the couple lives together in the same dwelling	0.245	0.430

Table 12 (continued)

Variable	Definition	Mean	Std.dev
Previous marriages	Number of previous marriages	0.076	0.277
Health	Ordered variable for the person's health status during the past 4 weeks. The variable ranges from 1 "bad" to 5 "very good."	3.745	0.980
Relationship duration	Duration of the relationship with the current partner in months	111.764	88.431
Age	The person's age in years	33.269	7.755
Age^2	The person's age squared	1166.965	507.925
Age^3	The person's age to the power of three	42,735.120	26,189.620
Protestant	Dummy equals 1 if the person has a Protestant religious affiliation	0.317	0.465
Catholic	Dummy equals 1 if the person has a Catholic religious affiliation	0.279	0.449
Muslim	Dummy equals 1 if the person has a Muslim religious affiliation	0.028	0.164
Other religion	Dummy equals 1 if the person has another religious affiliation	0.031	0.172
Cohort dummies	Dummy variables for the birth cohort	—	—
Wave dummies	Dummy variables for the years of observation	—	—

$N = 10,830$. The descriptive statistics are based on the estimation sample for sexual satisfaction with the pooled waves 2009, 2013, and 2017. The reference group of the variables for marriage and cohabitation (variables for employment status, variables for religion) consists of persons who do not live together with the partner (persons who are unemployed or out of the labor force, persons who are not religious)

Conflict of interest The authors declare no competing interests.

References

Adamopoulou E (2013) New facts on infidelity. Econ Lett 121:458–462

Agarwal B (1997) "Bargaining" and gender relations: within and beyond the household. Fem Econ 3:1–51

Allen MS (2019) The role of personality in sexual and reproductive health. Curr Dir Psychol Sci 28:581–586

Allen MS, Walter EE (2018) Linking Big Five personality traits to sexuality and sexual health: a meta-analytic review. Psychol Bull 144:1081–1110

Allport GM, Odbert HS (1936) Traitnames. A psycho-lexical study. Psychol Monogr 47:171

Almlund M, Duckworth AL, Heckman J, Kautz T (2011) Personality psychology and economics. In: Hanushek EA, Machin S, Woessmann L (eds) Handbook of the Economics of Education, vol 4. Elsevier, pp 1–181

Angeli V, Bertoni M, Corazzini L (2018) Does paternal unemployment affect young adult offspring's personality? J Hum Cap 12:542–567

Anger S, Camehl G, Peter F (2017) Involuntary job loss and changes in personality traits. J Econ Psychol 60:71–91

Ashton MC, Lee K, de Vries RE (2014) The HEXACO honesty-humility, agreeableness, and emotionality factors: a review of research and theory. Pers Soc Psychol Rev 18:139–152

Averett SL, Bansak C, Smith JK (2020) Behind every high earning man is a conscientious woman: the impact of spousal personality on earnings and marriage. J Fam Econ Iss. Forthcoming

Becker A, Deckers T, Dohmen T, Falk A, Kosse F (2012) The relationship between economic preferences and psychological personality measures. Ann Rev Econ 4:453–478

Bergstrom TC (1997) A survey of theories of the family. In: Rosenzweig MR, Stark O (eds) Handbook of Population and Family Economics. Elsevier, pp 21–77

Bishai D, Grossbard S (2010) Far above rubies: bride price and extramarital sexual relations in Uganda. J Popul Econ 23:1177–1187

Blanchflower DG, Oswald AJ (2004) Money, sex and happiness: an empirical study. Scand J Econ 106:393–415

Borghans L, Duckworth AL, Heckman JJ, ter Weel B (2008) The economics and psychology of personality traits. J Human Resour 43:972–1059

Bouchard TJ, Loehlin JC (2001) Genes, evolution, and personality. Behav Genet 31:243–273

Boxho C, Donald A, Goldstein M, Montalvao J, Rouanet L (2020) Assortative matching in Africa: evidence from rural Mozambique, Côte d'Ivoire, and Malawi. Econ Lett 187:108924

Brüderl J, Schmiedeberg C, Castiglioni L, Arránz Becker O, Buhr P, Fuÿ D, Ludwig V, Schröder J, Schumann N (2018) The German family panel - study design and cumulated field report (Waves 1 to 9). Pairfam Technical Paper No. 01

Buss DM (1996) Social adaption and five major factors of personality. In: Wiggins JS (ed) The Five-Factor Model of Personality: Theoretical Perspectives. Guilford Press, pp 180–207

Caliendo M, Fossen F, Kritikos A (2014) Personality characteristics and the decisions to become and stay self-employed. Small Bus Econ 42:787–814

Castelo-Branco C, Palacios S, Ferrer-Barriendos J, Alberich X (2010) Do patients lie? An open interview vs. a blind questionnaire on sexuality. J Sex Med 7:873–880

Cheng Z, Smyth R (2015) Sex and happiness. J Econ Behav Organ 112:26–32

Clark TS, Linzer DA (2015) Should I use fixed or random effects? Polit Sci Res Methods 3:399–408

Cobb-Clark DA (2015) Locus of control and the labor market. IZA J Labor Econ 4:1–19

Cobb-Clark DA, Schurer S (2012) The stability of Big-Five personality traits. Econ Lett 115:11–15

Cobb-Clark DA, Tan M (2011) Noncognitive skills, occupational attainment, and relative wages. Labour Econ 18:1–13

Costa PT, Herbst JH, McCrae RR, Siegler IC (2000) Personality at midlife: stability, intrinsic maturation, and response to life events. Assessment 7:365–378

Elkins RK, Kassenboehmer SC, Schurer S (2017) The stability of personality traits in adolescene and young adults. J Econ Psychol 60:37–52

de Leeuw ED, Hox J, Huisman M (2003) Prevention and treatment of item nonresponse. J Off Stat 19:153–176

Doroszuk M, Kupis M, Czarna AZ (2019) Personality and friendships. In: Zeigler-Hill V, Shackelford TK (eds) Encyclopedia of personality and individual differences. Springer Nature. https://doi.org/10.1007/978-3-319-28099-8_712-1

Dupuy A, Galichon A (2014) Personality traits and the marriage market. J Polit Econ 122:1271–1319

Eysenck HJ (1971) Personality and sexual behavior. J Psychosom Res 16:141–152

Eysenck HJ (1976) Sex and personality. Open Books, London

Flinn CJ, Todd PE, Zhang W (2018) Personality traits, intra-household allocation and the gender wage gap. Eur Econ Rev 109:191–220

Fair RC (1978) A theory of extramarital affairs. J Polit Econ 86:45–61

Frey BS (2008) Happiness: a revolution in economics. MIT Press, Cambridge

Frey BS, Stutzer A (2002) Happiness and economics. Princeton University Press, Princeton

Goldberg LR (1981) Language and individual differences: the search for universals in personality lexicons. Rev Person Soc Psychol 2:141–165

Hajek K (2019) Sex and housework: does perceived fairness of the distribution of housework actually matter? Z Familienforschung 31:83–104

Huinink J, Brüderl J, Nauck B, Walper S, Castiglioni L, Feldhaus M (2011) Panel analysis of intimate relationships and family synamics (pairfam): conceptual framework and design. Z Familienforschung 23:77–100

Jirjahn U, Chadi C (2020) Out-of-partnership births in East and West Germany. Rev Econ Household 18:853–881

John OP, Naumann LP, Soto CJ (2008) Paradigm shift to the integrative Big Five trait taxonomy: history, measurement, and conceptual issues. In: John OP, Robins RW, Pervin LA (eds) Handbook of Personality: Theory and Research, 3rd edn. Guilford Press, New York, pp 114–158

Josephs L, Shimberg J (2010) The dynamics of sexual fidelity: personality style as a reproductive strategy. Psychoanal Psychol 27:273–295

Kahneman D, Krueger AB, Schkade D, Schwarz N, Stone A (2004) Toward national wellbeing accounts. Am Econ Rev 94:429–434

Kandler C, Riemann R, Spinath FM, Angleitner A (2010) Sources of variance in personality facets: a multiple-rater twin study of self-peer, peer-peer, and self-self (dis)agreement. J Pers 78:1565–1594

Kays K, Gathercoal K, Burhow W (2012) Does survey format influence self-disclosure on sensitive question items? Comput Hum Behav 28:251–156

Kislev E (2020) Does marriage really improve sexual satisfaction? Evidence from the pairfam data set. J Sex Res 57:470–481

Komura M (2013) Fertility and endogenous gender bargaining power. J Popul Econ 26:943–961

Langhaug LF, Sherr L, Cowan FM (2010) How to improve the validity of sexual behavior reporting: systematic review of questionnaire delivery modes in developing countries. Tropical Med Int Health 15:362–381

Laumann EO, Paik A, Glasser DB, Kang JH, Wang T, Levinson B, Moreira E, Nicolosi A, Gingell C (2006) A cross-national study of subjective wellbeing among older women and men: findings from the global study of sexual attitudes and behaviors. Arch Sex Behav 35:143–159

Lazear EP (2000) Economic imperialism. Quart J Econ 115:99–146

Loewenstein G (2000) Emotions in economic theory and economic behavior. Am Econ Rev 90:426–432

Loewenstein G, Krishnamurti T, Kopsic J, McDonald D (2015) Does increased sexual frequency enhance happiness? J Econ Behav Organ 116:206–218

Lundberg S (2011) Psychology and family economics. Perspekt Wirtsch 12:66–81

Lundberg S (2012) Personality and marital surplus. IZA J Labor Econ 1:3

Lundberg S, Pollak RA (1994) Non-cooperative bargaining models of marriage. Am Econ Rev 84:132–137

Lundberg S, Pollak RA (1996) Bargaining and distribution in marriage. J Econ Perspect 10:139–158

McAdams DP, Pals JL (2006) A new Big Five: fundamental principles for an integrative science of personality. Am Psychol 61:204–217

McCallum EB, Peterson ZD (2012) Investigating the impact of inquiry mode on self-reported sexual behavior: theoretical considerations and review of the literature. J Sex Res 49:212–226

McCrae RR, Costa PT (2008) The five-factor theory of personality. In: John OP, Robins RW, Pervin LA (eds) Handbook of Personality: Theory and Research, 3rd edn. Guilford Press, New York, pp 159–181

Morgan PC, Durtschi JA, Kimmes JG (2018) Sexual and relationship satisfaction associated with shifts in dyadic trajectories of depressive symptoms in German couples across four years. J Marital Fam Ther 44:665–670

Mueller G, Plug E (2006) Estimating the effect of personality on male and female earnings. Ind Labor Relat Rev 60:3–22

Müller B, Castiglioni L (2015) Attrition im Beziehungs- und Familienpanel pairfam. In: Schupp J, Wolf C (eds) Nonresponse Bias: Qualitätssicherung sozialwissenschaftlicher Umfragen. Springer, Wiesbaden, pp 383–408

Müller B, Schmiedeberg C (2020) Do respondents get used to answering sensitive questions? Refusal of items on Sexuality and Fertility in a Panel Survey. Public Opin Q 84:654–674

Nettle D (2006) The evolution of personality variation in humans and other animals. Am Psychol 61:622–631

Peetz J, Kammrath L (2011) Only because I love you: why people make and why they break promises in romantic relationships. J Pers Soc Psychol 100:887–904

Peterson A, Geher G, Kaufman SB (2011) Predicting preferences for sex acts: which traits matter most, and why? Evol Psychol 9:371–389

Plümper T, Troeger VE (2019) Not so harmless after all: the fixed-effects model. Polit Anal 27:21–45

Potter J (2011) Reexamining the economics of marital infidelity. Econ Bullet 31:41–52

Rainer H, Smith I (2012) Education, communication and wellbeing: an application to sexual satisfaction. Kyklos 65:581–598

Rammstedt B, John OP (2005) Kurzversion des Big Five Inventory (BFI-K): Entwicklung und Validierung eines ökonomischen Inventars zur Erfassung der fünf Faktoren der Persönlichkeit. Diagnostica 51:195–206

Rammstedt B, John OP (2007) Measuring personality in one minute or less: a 10-item short version of the Big Five inventory in English and German. J Res Pers 41:203–212

Roberts BW (2009) Back to the future: personality and assessment and personality development. J Res Pers 43:137–145

Roberts BW, Kuncel NR, Shiner R, Caspi A, Goldberg LR (2007) The power of personality: the comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. Perspect Psychol Sci 2:313–345

Risse L, Farrell L, Fry T (2018) Personality and pay: do gender gaps in confidence explain gender gaps in wages? Oxf Econ Pap 70:919–949

Schmiedeberg C, Huyer-May B, Castiglioni L (2017) The more or the better? How sex contributes to life satisfaction. Arch Sex Behav 46:465–473

Schmiedeberg C, Schröder J (2016) Does sexual satisfaction change with relationship duration? Arch Sex Behav 45:99–107

Schröder J, Schmiedeberg C (2015) Effects of relationship duration, cohabitation, and marriage on the frequency of intercourse in couples: findings from German panel data. Soc Sci Res 52:72–82

Smith A, Lyons A, Ferris J, Richters J, Pitts M, Shelley J, Simpson JM (2011) Sexual and relationship satisfaction among heterosexual men and women: the importance of desired frequency of sex. J Sex Marital Ther 37:104–115

Smith I (2012) Reinterpreting the economics of extramarital affairs. Rev Econ Household 10:319–343

Soto CJ, John OP (2017) Short and extra-short forms of the Big Five inventory–2: the BFI–2–S and the BFI–2–XS. J Res Pers 68:69–81

Specht J, Egloff B, Schmukle SC (2011) Stability and change of personality across the life course: the impact of age and major life events on mean-level and rank-order stability of the Big Five. J Pers Soc Psychol 101:862–882

Sprecher S (2002) Sexual satisfaction in premarital relationships: associations with satisfaction, love, commitment, and stability. J Sex Res 39:190–196

Swaffield JK (2001) Does measurement error bias fixed-effects estimates of the union wage effect? Oxford Bull Econ Stat 63:437–457

Van Kampen D (2012) The 5-dimensional personality test (5DPT): relationship with two lexically based instruments and the validation of the absorption scale. J Pers Assess 94:92–101

Velten J, Margraf J (2017) Satisfaction guaranteed? How actor, partner, and relationship factors impact sexual satisfaction within partnerships. PLoS ONE 12:e0172855. https://doi.org/10.1007/s10508-015-0547-8

Weiss Y (1997) The formation and dissolution of families: why marry? Who marries whom? And what happens upon divorce? In: Rosenzweig MR, Stark O (eds) Handbook of Population and Family Economics. Elsevier, pp 81–123

Wood E, Nosko A, Desmarias S, Roos S, Irvine C (2006) Online and traditional paper-and-pencil survey administration: examining experimenter presence, sensitive material and long surveys. Can J Human Sex 15:147–155

World Health Organization (2006) Defining sexual health: report of a technical consultation on sexual health. Geneva.

Yakita A (2018) Fertility and education decisions and child-care policy effects in a Nash-bargaining family model. J Popul Econ 31:1177–1201