




The relationship of number of sexual partners with personality traits, age, gender and sexual identification

Aleksandra Rogowska , Magdalena Tofel, Barbara Zmaczyńska-Witek and Zofia Kardasz

Institute of Psychology University of Opole, Opole, Poland

ABSTRACT

Although personality has been tested as a predictor of sexual behaviours, little is known about the contribution of personality to the number of sexual partners. This study aimed to examine the models of association between the number of lifetime sexual partners and personality traits in lesbian, gay, bisexual (LGB) and heterosexual people. A web-based questionnaire was administered to the 768 Polish adults aged between 16 and 42 years old, including 61% women. Of the participants, 61% identified themselves as heterosexual, 22% as bisexual and 17% as homosexual. A series of multiple regression analyses was conducted to find the best predictors for the association between Big-Five personality traits and the number of lifetime sexual partners. Age, gender, and sexual identification were also included in the analysis. Higher level of extraversion and lower level of agreeableness were the best predictors of a higher number of sexual partners. Sexual identification was a moderator of the relation between emotional stability and the number of sexual partners, whereas age and gender were separate moderators of the association between extraversion and number of sexual partners. Scientists and clinicians may use these predictors to prepare prevention and therapy for people at risk of sexual addiction or STIs.

ARTICLE HISTORY

Received 17 May 2019

Accepted 2 April 2020

KEYWORDS

Big Five; personality traits; sexual identification; number of sexual partners

Introduction

The number of sexual partners over the lifetime

The number of sexual partners over the lifetime is one of the measures of sexual behaviour. The third Nationwide Survey on Sexual Attitudes and Lifestyle (Natsal-3) showed that one in three men and one in four women has had at least ten opposite-sex partners over their lifetime (Mercer, 2014). The number of sexual partners is related to gender and sexual identity (Clifton et al., 2013; Geary et al., 2018). In the sample aged 16–44, the mean number of opposite-sex partners in the lifetime was 11.7 ($SD = 21.6$, $Mdn = 6$) in men and 7.7 ($SD = 16.2$, $Mdn = 4$) in women, whereas the mean number of same-sex partners in the lifetime was 27.5 ($SD = 88.1$, $Mdn = 3$) in men and 2.9 ($SD = 5.5$, $Mdn = 1$) in women. A lesbian, gay or bisexual (LGB) identity was reported by 2.5% of men and 2.4% of women (Geary et al., 2018). Research has shown that gay and bisexual men have greater numbers of lifetime and annual sexual partners, continue to form new partnerships later in life and report a higher prevalence of partner concurrency (Glick et al., 2012). Generally, the number of lifetime sexual partners is higher among men than women, as has been consistently evidenced in a longitudinal study (Mercer et al., 2013).

Overall, the number of partners grows with age, in particular between the ages of 16 and 44 (Clifton et al., 2013). However, the frequency and range of sexual practices that people engage in declines with age (Mercer, 2014). Mercer et al. (2013) found that the mean number of female sexual partners over the lifetime increases from 6.5 until 20.1 in men between ages 16–64, and then the number of partners decreases significantly below 14. The mean number of male sexual partners over the lifetime increase from 5.2 until 8.9 in women between ages 16–34, and then the number of partners slightly decreases, remaining in the range between 6 and 7 partners. This may mean that the number of sexual partners varies depending on generation, as well as age and sex. Moreover, Field et al. (2013) found that both sexual satisfaction and the frequency of recent sexual activity decreased with age after the age of 45 years in men and after the age of 35 years in women.

Most likely there are cross-cultural differences in the number of sexual partners since sexuality involves the interrelationship of biological, psychological and sociocultural dimensions (Greenberg et al., 2010). Worldwide statistical studies (e.g., Durex, 2010; Superdrug, 2017) indicate that people's average number of partners vary from country to country. Unfortunately, there is a lack of scientific cross-cultural study on this issue, to confirm the statistical data.

Personality traits in relation to gender and age

The Big Five model of personality was created to characterise individual differences in behaviour, thinking and feelings in psychologically healthy individuals (Baumert et al., 2019). Traits constitute the structure of personality, account for both intraindividual and interindividual differences, and are measurable and relatively independent of each other (Fajkowska & Kreitler, 2018). The Big-Five model of personality has been globally confirmed in a countless studies across a variety of languages and cultures and includes the following traits: neuroticism, extraversion, openness (intellect or imagination), agreeableness, and conscientiousness (Allik et al., 2017). Strus et al. (2014) confirmed that the Abridged Big Five-Dimensional Circumplex model of personality (Goldberg, 1999) presents a circular structure, with each factor as composed of 9 facets in the lower level of hierarchy.

Extroverted people are highly engaged with the external world, they are active, enthusiastic, full of energy, they enjoy interacting with people and like to dominant in social settings. Extraversion consisted of the following facets: Gregariousness, Friendliness, Assertiveness, Poise, Leadership, Provocativeness, Self-disclosure, Talkativeness, Sociability. Low level of Emotional Stability (as a negative trait to Neuroticism) manifest in high emotional reactivity, low tolerance for stress or aversive stimuli, strong tendency to experience and express negative emotions (such as anger, anxiety, or depression), related often with an irrational behaviour. Emotional Stability covers the following lower-level traits: Stability, Happiness, Calmness, Moderation, Toughness, Impulse control, Imperturbability, Cool-headedness, Tranquillity. Agreeable individuals have an optimistic view of human nature, that is why they are trusting and trustworthy to others, try to be very helpful, considerate, kind, and generous, they express tendency to cooperation instead of competition. On the lower level, Agreeableness reflects in Understanding, Warmth, Morality, Pleasantness, Empathy, Cooperation, Sympathy, Tenderness, and Nurturance. Individuals high in conscientiousness show tendency to self-discipline, they are very good at self-control, can excellently manage and regulate their impulses, they like order, punctuality, and perfectionism, they are responsible and strive for high achievements. The lower level of This trait consists of the following facets: Conscientiousness, Efficiency, Dutifulness, Purposefulness, Organisation, Cautiousness, Rationality, Perfectionism, Orderliness. People with high scores in Intellect (Openness to experiences) are sensitive to art and beauty, they absorb unusual ideas and behaviours, they are creative, intellectually curious and willing to try new things. The lower-level facets related to Intellect include: Intellect, Ingenuity, Reflection, Competence, Quickness, Introspection, Creativity, Imagination, and Depth.

Although personality traits are relatively consistent and stable over time, there is also some degree of change related to the inherited features and specific environmental conditions of life that may result in development, improving adaptation and well-being or, inversely, poorer health

and impaired functioning in somatic, psychic and social dimensions (Bouchard & Loehlin, 2001; Briley & Tucker-Drob, 2014; Buss & Greiling, 1999; Donnellan et al., 2015; Roberts et al., 2008). Baumert et al. (2019) suggest that changes in behaviour might depend on motivation and causal processes, as well as on complex interplays of potentially counteracting processes, such as social cognitive learning processes, self-regulatory processes and processes of self-concept formation.

Considering the interaction between genetic and environmental influences on complex traits as dynamic factors, the two concepts regard to personality changes across the lifespan must be explained: heritability and stability (Matthews et al., 2003; Rantanen et al., 2007). Term 'heritability' is used to estimate the degree of trait variation, due to genetic variation between individuals in that population (e.g., 50% of the differences between people in extraversion may be due to genetic differences between them). There are both environmental and genetic determinants of the stability/change of personality traits across the lifespan. In general, genetic factors, established identity and maturity of personality tend to the stability of personality traits, whereas unstable environments and wobbly social relationships correspond with larger changes in individual differences (Matthews et al., 2003; Rantanen et al., 2007).

Gender seems to have a greater impact on differences in personality in younger than older ages (Soto et al., 2011; Roberts et al., 2006). In particular, males and females differ in the heritability of extraversion and neuroticism (Bouchard & Loehlin, 2001). A longitudinal study found that neuroticism and extraversion were more stable in men than in women, whereas openness to experience, agreeableness, and conscientiousness were as stable in men as in women (Rantanen et al., 2007).

Most longitudinal studies indicate that age has a complex curvilinear influence on mean levels of personality traits, which follow an inverted U-shaped function, reaching a peak in the middle years and decreasing afterwards (Lucas & Donnellan, 2011; Schwaba & Bleidorn, 2018; Specht et al., 2011; Tummers et al., 2010; Roberts et al., 2006; Wortman et al., 2012). Trajectories for particular traits differ with regard to slope degree (flat – precipitous) and relative altitude. Extraversion, openness and neuroticism decline in later adulthood, whereas conscientiousness and agreeableness still increase (a slight decrease appears only in the older old). A meta-analytical review (Briley & Tucker-Drob, 2014) demonstrated that the longitudinal stability of personality is low in childhood but increases substantially into adulthood.

The association between personality and the number of lifetime sexual partners with regards to sexual identity, gender and age

Allen and Walter (2018) have provided evidence that personality traits are related to sexual health. The main results of their meta-analysis (Allen & Walter, 2018) implied that there is a small positive relation between the number of lifetime sexual partners and extraversion ($r = .22$, 95% CI [.12, .31], $p < .001$) and openness ($r = .15$, 95% CI [.12, .17], $p < .001$). The number of lifetime sexual partners also had a trivial positive association with neuroticism ($r = .05$, 95% CI [.02, .17], $p < .001$) and a negative but not significant relationship with agreeableness and conscientiousness.

Allen and Walter (2018) stated that significant heterogeneity for all associations between sexual activity and personality supported using regression to search potential moderators among age and gender. However, no gender moderation effect between lifetime number of sexual partners and personality traits was found (Allen & Walter, 2018). The positive relationship between sexual activity and openness was stronger in older people, whereas the negative association between sexual activity and conscientiousness was stronger in younger individuals. Allen and Desille (2017) also found that a greater number of sexual partners was related to higher levels of openness and lower levels of agreeableness. Moreover, for sexually active older adults, higher levels of extraversion and lower levels of conscientiousness were also related to a greater number of sexual partners in men but not women.

The Big Five personality traits are also related to sexual orientation (Allen & Walter, 2018; Bogaert et al., 2018). Openness demonstrates the strongest connection to nonheterosexual orientation (Allen

& Walter, 2018; Bogaert et al., 2018). The recent meta-analysis (Allen & Walter, 2018) indicates that there is a small positive association between sexual orientation and openness, $r = .16$, 95% *CI* [.11, .21], $p < .001$. This relationship is stronger for men ($r = .18$, 95% *CI* [.09, .26], $p < .001$), when compared to women ($r = .13$, 95% *CI* [.03, .24], $p < .05$). A current study (Bogaert et al., 2018) showed that bisexual individuals averaged higher in openness to experience than did heterosexuals. Also, the recent cross-cultural study about mate preferences (Valentova et al., 2016) indicates that non-heterosexual women desired partners who score higher on Agreeableness and Openness when compared to men and non-heterosexual women.

The association between sexual orientation and neuroticism is moderated by gender (Allen & Walter, 2018). Neuroticism showed a small positive association with homosexual orientation in gay men ($r = .15$, 95% *CI* [.09, .22], $p < .001$), and a trivial negative association among lesbians ($r = -.05$, 95% *CI* [-.10, .00], $p < .05$). Bogaert et al. (2018) also demonstrated a small difference between gay men and lesbians on neuroticism. However, heterosexual men averaged much lower in emotionality than heterosexual women (Bogaert et al., 2018).

The current study

The aim of this study is to understand individual differences in sexual activity, assessed by the dimension of lifetime number of sexual partners in a nonclinical population. This study is focused on the relationship between the number of lifetime sexual partners as a dependent variable, and age, gender, sexual orientation, and personality traits as independent variables. Although several previous studies have examined these relationships with selected variables, to our best knowledge there is a lack of comprehensive research that includes all of these predictors together in one analysis. Because age, gender and sexual orientation may be intercorrelated and can influence both sexual behaviour and personality concurrently, the comprehensive analysis may be a valuable way to find the mechanism that will explain individual differences in the lifetime number of sexual partners.

In recent research (Allen & Desille, 2017; Allen & Walter, 2018; Bogaert et al., 2018), age, gender and sexual orientation were considered as moderators of the relationship with sexual activity and personality traits. Thus, moderation analysis will be performed here to explore the effect of age, gender, and sexual identification on the relationship between the number of sexual partners and personality traits. In particular, age will be considered as a moderator variable for the first time, to our best knowledge. As shown previously, age has a strong relationship with both personality and sexual activity, but the specific pattern of the interrelationship is unknown.

On the basis of existing literature, we may expect a higher number of lifetime sexual partners among males (when compared to females), and LGB people (when compared to heterosexual individuals). With older age, the number of sexual partners should increase as well. We can also expect that the number of sexual partners is positively associated with extraversion, intellect/imagination (openness), and negatively with emotional stability (inverse of neuroticism). The negative association between lifetime number of sexual partners and both agreeableness and conscientiousness has been found in the older population (Allen & Desille, 2017), although this relation was not significant in a recent meta-analytic study (Allen & Walter, 2018). Thus, we will examine whether age moderates the relationship of the number of sexual partners with agreeableness and conscientiousness. We can also suggest that both gender and age moderate the relationship of the number of sexual partners with extraversion and conscientiousness, since there is a positive association in men but not in women in older people (Allen & Desille, 2017). The research indicates that openness and neuroticism are associated with sexual identification and further that gender moderates this relation (Allen & Walter, 2018). However, little is known about whether this association is also linked to sexual activity in term of lifetime sexual partners. We will test gender and sexual identification as potential moderators of the association between openness, neuroticism and number of sexual partners.

Method

Participants

This study was conducted in Poland. Initially, for data collection, 815 participants were recruited who answered a web-based invitation. Of these individuals, 6% ($n = 47$) were excluded from the analyses because they had missing values for one or more of the classification variables. The study sample consisted of the remaining 768 individuals, including 300 men (39%), and 468 women (61%). Participant age ranged from 16 to 42, with a mean of 21 years ($M = 21.06$, $SD = 3.57$).

Almost 61% of individuals self-identified as heterosexual ($n = 470$, including 281 women and 181 men), whereas bisexual identification was declared by 22% ($n = 170$, including 133 females and 37 males), and homosexual identification by 17% ($n = 128$, including 54 lesbians and 74 gays) of the sample. The association between sexual identification and gender was significant, $\chi^2(2) = 40.53$, $p < .0001$, $\phi = .22$ (Table 1).

Measures

Personality

The Big Five personality traits were measured using the International Personality Item Pool-Big Five Markers-20 (IPIP-BMF-20), known also as the Mini-IPIP scale. The self-reported questionnaire was developed by Donnellan et al. (2006) and validated for use in Poland by Topolewska et al. (2014). The questionnaire is a self-reported 20-item scale (Donnellan et al., 2006), with four items per Big Five trait, such as Extraversion, Conscientiousness, Emotional Stability, Agreeableness, and Intellect/Imagination. Participants are instructed to indicate how accurate each phrase is for them, using a five-point Likert-type scale. The Cronbach's alpha for the IPIP-BMF-20 in the present study was acceptable for Extraversion ($\alpha = .85$), Conscientiousness ($\alpha = .76$), Emotional Stability ($\alpha = .75$), Agreeableness ($\alpha = .67$), and Intellect/Imagination ($\alpha = .72$).

Demographics

The number of sexual partners over the lifespan was assessed by the question 'How many sexual partners you have had so far?' Self-identified sexual orientation was assessed as heterosexual, bisexual, or homosexual. For further analysis, sexual identification was coded as 0 – heterosexual, 1 – bisexual and 2 – homosexual. Status of coming out was assessed by using the question 'Do you hide your sexual orientation?' The answer 'yes' was coded as 1, while 'no' was coded as 0. In addition, such demographic factors as age (in years old) and gender (coded as 0 – women, 1 – men) were measured.

Procedure

The online questionnaire was provided through social media, namely Facebook. Requests to share the invitation to the study on Facebook were submitted to the moderators of a dozen Facebook groups. Some of the Facebook groups were linked with sexual minorities. If the moderator agreed,

Table 1. Prevalence of gender and sexual identification in the sample.

Variables	Gender		
	Women <i>n</i> (%)	Men <i>n</i> (%)	Total <i>n</i> (%)
Sexual identification			
Heterosexual	281 (37)	189 (24)	470 (61)
Bisexual	133 (17)	37 (5)	170 (22)
Homosexual	54 (7)	74 (10)	128 (17)
Total	468 (61)	300 (39)	768 (100)

the invitation to participate in the study was sent to all members of the group by email. If respondents agreed to participate, they were provided with a written informed consent, and anonymously completed a web-based survey. Participants answered the IPIP-BMF-20, the shortened version 13-item Sensation-Seeking Scale, and questions regarding the number of lifetime sexual partners, sexual identity, coming out and demographics (gender, age). Institutional Review Board approval was obtained for the study procedures for recruitment, data collection and analysis.

Statistical analysis

Because the distribution of the number of sexual partners as a dependent variable deviated from normality, we conducted Poisson Regression and Negative Binomial Regression models for comparison (Hardin & Hilbe, 2003). The negative binomial regression model had the best fit to the data; thus it was used to predict the number of sexual partners over the lifetime. Negative Binomial Regression is a type of generalised linear model in which the dependent variable (lifetime number of sexual partners) is a count of the number of times an event occurs. Negative Binomial Regression is similar to regular multiple regression, except that the dependent variable is an observed count that follows the negative binomial distribution (Hilbe, 2011). The Binomial Regression was conducted separately for the total sample, as well as for the heterosexual, bisexual and homosexual samples.

The moderation models were tested separately for each of the Big Five personality traits (Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect/Imagination) by using the PROCESS 3.3. macro for SPSS, designed by Hayes (2017, 2019)). The conditional effect was tested based on a bias-corrected bootstrapping procedure with 5,000 samples. A bootstrap confidence interval (95% CI) which does not include the '0' value signals a significant effect. Also, as suggested by Preacher et al. (2007), the independent variable was mean-centred prior to analysis, providing a clearer and easier explanation of the interaction effect between the predictor and moderator variables on the dependent variable. Analyses were performed using Statistica (2019), and Statistical Package for the Social Sciences (SPSS, 2019).

Results

Number of sexual partners and demographic variables

The average number of sexual partners in the sample ($n = 768$) was three, ranging between 0 and 72 sexual partners over the lifespan, $M = 2.97$, $SD = 5.83$, $Mdn = 1$. Twenty-three per cent of the participants was before sexual initiation (BSI) ($n = 175$, including 84 women and 91 men). The mean age of the BSI sample was 20 years ($M = 19.69$, $n = 175$), while the mean age of participants after sexual initiation (ASI) was 21 years ($M = 21.46$, $n = 593$), $Z = 6.70$, $p < .0001$, $\eta^2 = .06$. An intermediate correlation between age and lifetime number of sexual partners was found, $r = .28$, $t = 8.10$, $p < .0001$, $N = 768$. Of the participants, the majority (55%, $n = 420$, including 276 women and 144 men) declared to have had from one to three sexual partners over their lifespan, and 23% ($n = 173$, including 108 women and 65 men) reported to have had four or more lifetime sexual partners.

Among ASI participants ($n = 593$, 77% of the sample), the average number of sexual partners was four (ranging between 1 and 72 sexual partners, $M = 3.84$, $SD = 6.37$, $Mdn = 2$). Generally, the number of lifetime sexual partners was similar among men ($M = 4.32$, $SD = 8.21$, $Mdn = 2$, $n = 209$, range 1–72) and women ($M = 3.59$, $SD = 5.10$, $Mdn = 2$, $n = 384$, range 1–50), $Z = -0.82$, $p = .41$, $\eta^2 = .01$. When comparing heterosexual and LGB samples, the average number of lifetime sexual partners in the heterosexual sample was around three ($M = 2.62$, $SD = 2.96$, $Mdn = 1$, $n = 357$), while among homosexual individuals it was around five ($M = 5.47$, $SD = 8.89$, $Mdn = 3$, $n = 105$), and in the bisexual group it was around six ($M = 5.88$, $SD = 9.34$, $Mdn = 3$, $n = 131$), $F(2, 590) = 17.54$, $p < .0001$, $\eta^2 = .06$. A significant difference was found between the heterosexual group and both the bisexual ($p = .0000$) and homosexual ($p = .0001$) samples in terms of the number of lifetime sexual partners.

When gender was included in a two-way ANOVA 2 (Gender: Women, Men) \times 3 (Sexual Identification: Heterosexual, Bisexual, Homosexual), both gender [$F(1, 587) = 4.52, p < .05, \eta_p^2 = .007$] and sexual identification [$F(2, 587) = 14.68, p < .0001, \eta_p^2 = .05$] proved to change significantly the number of lifetime sexual partners, but without an interaction effect, $F(2, 587) = 1.73, p = .18, \eta_p^2 = .01$. More specifically, men ($M = 5.45, SE = .54, n = 209$) reported a higher number of lifetime sexual partners than women ($M = 4.04, SE = .38, n = 384$). In addition, heterosexual participants ($M = 2.66, SE = .34, n = 357$) declared a significantly lower number of lifetime sexual partners than both bisexual ($M = 6.23, SE = .71, n = 131$) and homosexual ($M = 5.34, SE = .60, n = 105$) participants, without a significant difference between the bisexual and homosexual samples.

Predictors of the number of sexual partners

Pearson's correlation was conducted to examine the association between the number of sexual partners and the personality dimensions. As shown in the correlation matrix (Table 2), the number of lifetime sexual partners is related positively to extraversion and emotional stability and is associated negatively with agreeableness.

A negative binomial regression was used to extract the predictors of the number of sexual partners over the lifespan. Four models of regression were performed separately for the total sample ($N = 768$), heterosexual sample ($n = 470$), bisexual sample ($n = 170$), and homosexual sample ($n = 126$). Demographic variables (i.e., age, gender and sexual identification) were included in the first step in the analysis, and personality scales (Extraversion, Agreeableness, Emotional Stability, Conscientiousness, and Intellect/Imagination) were added to the model of regression in the second step. The results are shown in Table 3.

Age, sexual identification and gender as moderator variables

For the first step, sexual identification, gender and age were examined separately as moderators of the relation between particular personality traits and number of sexual partners. We did not find a significant interaction effect between sexual identification and Extraversion, Agreeableness, Conscientiousness, and Intellect/Imagination on the number of sexual partners. Sexual identification was a significant moderator of the relationship between Emotional Stability and the number of sexual partners. The results are reported in Table 4 and Figure 1.

Neither Agreeableness, Conscientiousness, and Intellect/Imagination, nor Emotional Stability was in interaction with gender. Gender was found as a moderator exclusively when the association between extraversion and the number of sexual partners was tested (see Table 5 and Figure 2 for more details).

Age was explored as a potential moderator in the relationship between traits of personality and number of sexual partners. Age did not show a significant moderation effect on the relation of number of sexual partners with Agreeableness, Conscientiousness or Intellect/Imagination, nor Emotional Stability. Age was found as a moderator of the association between extraversion and number of sexual partners (see Table 6 and Figure 3 for more details).

Table 2. Summary of intercorrelations, means, standard deviations and ranges for scores on the personality dimensions and number of sexual partners over the lifespan ($N = 768$).

Variable	<i>M</i>	<i>SD</i>	Range	1	2	3	4	5
1. Extraversion	11.83	4.18	4-20					
2. Agreeableness	14.98	3.06	5-20	.18***				
3. Conscientiousness	11.71	3.68	4-20	.08	.15***			
4. Neuroticism	9.82	3.43	4-20	.28***	-.04	.18***		
5. Intellect	14.97	3.01	4-20	.29***	.19***	.04	.15***	
6. Number of sexual partners	2.97	5.83	0-72	.15***	-.07*	-.05	.08*	.06

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

Table 3. Predictors of the number of sexual partners in the lifespan.

Step	Predictors	Total sample <i>N</i> = 768				Heterosexual <i>n</i> = 470				Bisexual <i>n</i> = 170				Homosexual <i>n</i> = 128			
		<i>b</i>	SE	Wald	<i>d</i>	<i>b</i>	SE	Wald	<i>d</i>	<i>b</i>	SE	Wald	<i>d</i>	<i>b</i>	SE	Wald	<i>d</i>
1	Intercept	−1.38	.24	32.87***	1.19	−1.34	.38	12.59***	0.58	−2.24	.48	21.39***	1.64	−0.64	.44	2.15	0.19
	Age	0.12	.01	115.31***	4.16	0.09	.02	29.08***	1.34	0.17	.02	54.56***	4.18	0.10	.02	22.53***	1.99
	Gender (0)	0.03	.05	0.40	0.02	0.04	.05	0.48	0.03	0.14	.11	1.46	0.13	−0.09	.11	0.68	0.09
	Sexual orientation (0)	−0.51	.06	79.44***	3.66												
2	Intercept	−1.42	.35	16.72***	0.60	−2.16	.50	18.97***	0.87	−2.33	.71	10.87***	0.83	−0.19	.75	0.07	0.01
	Age	0.12	.01	115.45***	4.17	0.10	.02	32.89***	1.52	0.15	.02	54.38***	4.17	0.1	.02	21.80***	1.93
	Gender (0)	0.10	.05	4.79*	0.22	0.08	.06	2.20	0.13	0.27	.11	6.40*	0.56	−0.07	.12	0.33	0.05
	Sexual orientation (0)	−0.51	.06	83.92***	3.87												
	Extraversion	0.05	.01	21.70***	0.78	0.05	.01	11.27***	0.52	0.05	.02	4.58*	0.35	0.06	.03	4.68*	0.41
	Agreeableness	−0.06	.01	19.01***	0.69	−0.05	.02	7.78**	0.36	−0.08	.03	8.29**	0.64	−0.02	.04	0.36	0.03
	Conscientiousness	−0.03	.01	7.02**	0.25	−0.02	.01	1.89	0.09	−0.05	.02	4.13*	0.32	−0.03	.03	0.94	0.08
	Emotional stability	0.01	.01	0.27	0.01	−0.01	.02	0.72	0.03	0.07	.03	5.52*	0.42	0.02	.03	0.30	0.03
	Intellect/Imagination	0.02	.01	1.85	0.07	0.06	.02	8.73**	0.40	0.03	.03	0.88	0.07	−0.08	.04	4.79*	0.42

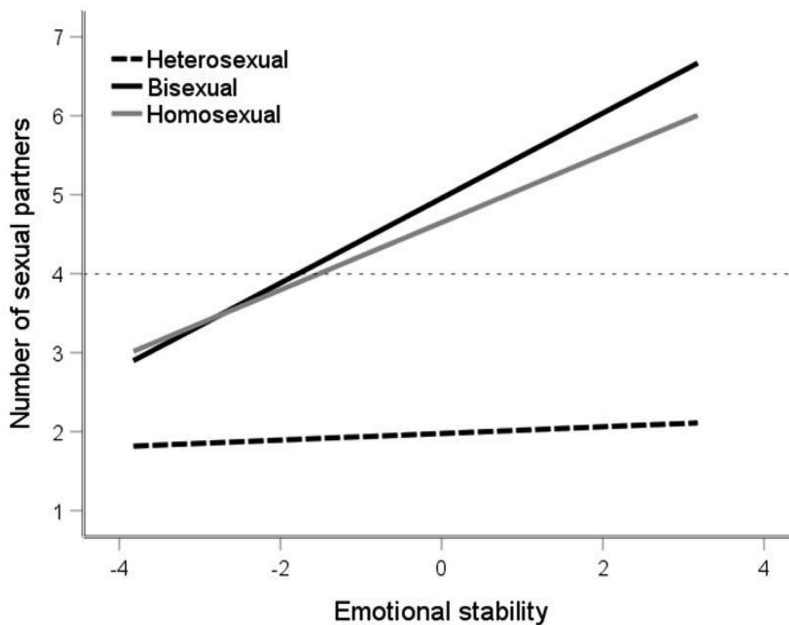
Gender was coded 0 = female, 1 = male. Sexual orientation was coded 0 = heterosexual, 1 = bisexual, 2 = homosexual.

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

Table 4. Results of moderation analysis for the number of sexual partners as a dependent variable, Emotional Stability (ES) as an independent variable and sexual identification as a moderator.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	Bootstrap 95% CI			
					<i>M</i>	<i>SE</i>	<i>LL</i>	<i>UL</i>
Constant	1.98	0.26	7.57	0.00	1.98	0.13	1.73	2.25
Emotional Stability (ES)	0.04	0.08	0.56	0.58	0.04	0.04	−0.04	0.11
Sexual Identification (SI)								
W1 Bisexual (B)	2.98	0.52	5.79	0.00	2.99	0.80	1.58	4.68
W2 Lesbians and Gays (LG)	2.67	0.56	4.74	0.00	2.67	0.77	1.30	4.36
Interaction term ES x SI								
Int 1 ES x B	0.50	0.15	3.24	0.00	0.50	0.22	0.13	1.00
Int 2 ES x LG	0.39	0.16	2.34	0.02	0.39	0.17	0.07	0.74

Number of bootstrap samples for percentile bootstrap confidence intervals was 5000.
 $R^2 = .08$, $F(5, 762) = 12.32$, $p < .001$, $f^2 = 0.09$.

**Figure 1.** Interaction effect between emotional stability and sexual orientation on the number of sexual partners over the lifetime.**Table 5.** Results of moderation analysis for the number of sexual partners as a dependent variable, Extraversion as an independent variable and gender as a moderator variable.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	Bootstrap 95% CI			
					<i>M</i>	<i>SE</i>	<i>LL</i>	<i>UL</i>
Constant	2.97	0.21	14.30	0.00	2.97	0.21	2.59	3.40
Extraversion (E)	0.20	0.05	4.05	0.00	0.20	0.05	0.10	0.31
Gender (G)	0.06	0.43	0.14	0.89	0.06	0.46	−0.80	1.02
Interaction term E x G	0.22	0.10	2.16	0.03	0.22	0.12	0.01	0.47

Number of bootstrap samples for percentile bootstrap confidence intervals was 5000.
 $R^2 = .03$, $F(3, 764) = 6.67$, $p < .001$, $f^2 = 0.03$.

In the second step, significant moderators were examined in interaction, to find the best model for the relationship between personality and number of sexual partners. Because previous results showed an insufficient level of significance for sexual identification and gender as a moderator of

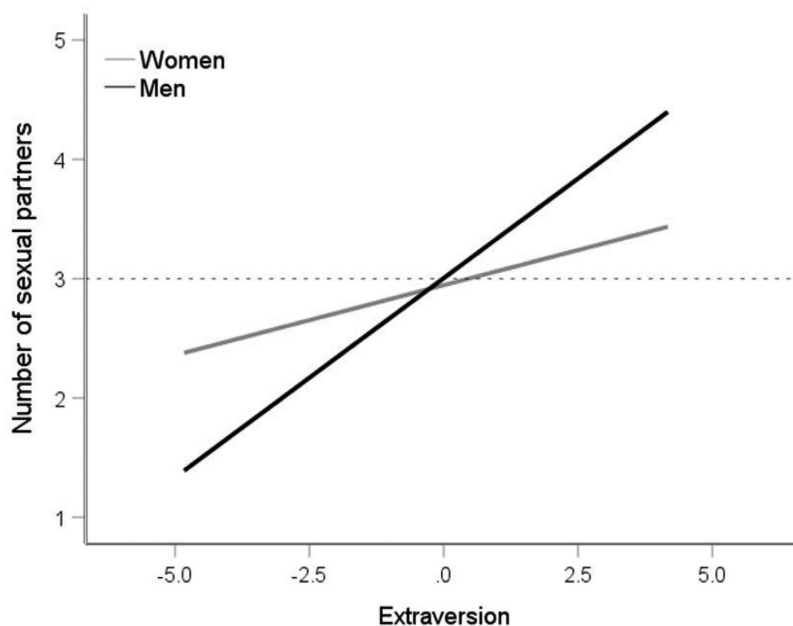


Figure 2. Interaction effect between extraversion and gender on the number of sexual partners over the lifetime.

Table 6. Results of moderation analysis for the number of sexual partners over the lifetime as a dependent variable, Extraversion (E) as an independent variable and age (A) as a moderator.

Variable	b	SE	t	p	Bootstrap 95% CI			
					M	SE	LL	UL
Constant	2.91	0.20	14.58	0.00	2.91	0.19	2.56	3.29
Extraversion (E)	0.18	0.05	3.70	0.00	0.18	0.05	0.09	0.28
Age (A)	0.41	0.06	7.19	0.00	0.41	0.09	0.25	0.60
Interaction term E x A	0.04	0.01	3.69	0.00	0.05	0.02	0.01	0.09

Number of bootstrap samples for percentile bootstrap confidence intervals was 5000.
 $R^2 = .11$, $F(3, 764) = 31.71$, $p < .001$, $f^2 = 0.12$.

Intellect/Imagination (openness) and Emotional Stability (neuroticism), as well as for gender and age as moderators of Conscientiousness, the moderated moderations were excluded from further analysis. Moderated moderation was conducted solely for both gender and age as moderators of the relationship between extraversion and the number of sexual partners (Model 3 of PROCESS 3.3. was selected for this purpose). Table 7 and Figure 4 demonstrate that among younger people, introvert women and extrovert men tended to have more sexual partners when compared to extrovert women and introvert men. However, in older age, both extrovert women and extrovert men tended to have more sexual partners than introverted people. A significant interaction effect was found separately between extraversion and age, as well as between extraversion and gender (see Table 7). However, the effect of moderated moderation was not affirmed, since the interaction between extraversion, age and gender was not significant.

Discussion

Number of sexual partners in relation to age, gender and sexual orientation

Consistent with the hypotheses and other studies (Clifton et al., 2013; Geary et al., 2018; Glick et al., 2012; Mercer et al., 2013), sexual identity is related to the number of sexual partners. LGB participants

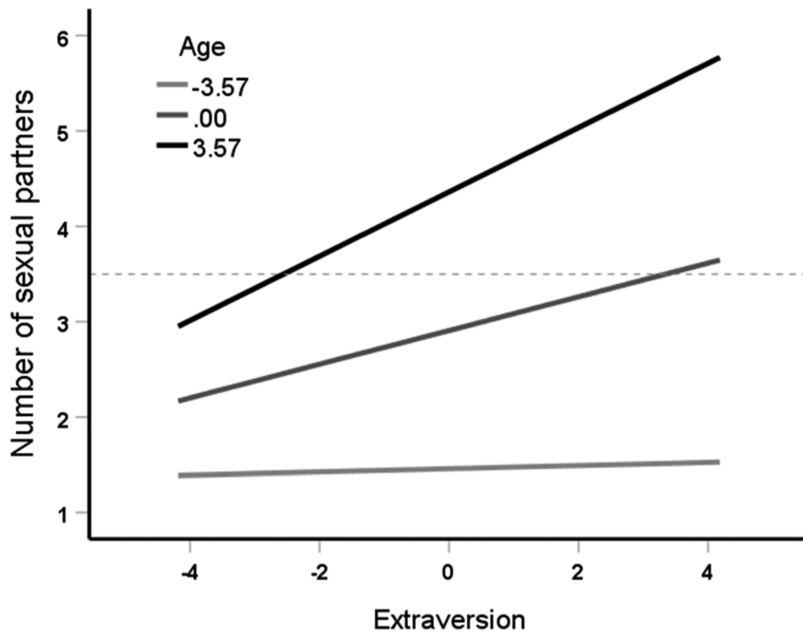


Figure 3. Interaction effect between extraversion and age on the number of sexual partners over the lifetime.

Table 7. Results of moderated moderation analysis for the number of sexual partners as a dependent variable, Extraversion (E) as an independent variable and both age and gender as a moderator.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	Bootstrap 95% CI			
					<i>M</i>	<i>SE</i>	<i>LL</i>	<i>UL</i>
Constant	2.92	0.20	14.62	0.00	2.91	0.18	2.57	3.28
Extraversion (E)	0.17	0.05	3.52	0.00	0.17	0.05	0.08	0.26
Age (A)	0.42	0.06	7.28	0.00	0.41	0.08	0.26	0.58
Interaction term E x A	0.05	0.01	3.70	0.00	0.05	0.02	0.01	0.09
Gender	−0.11	0.41	−0.28	0.78	−0.11	0.39	−0.85	0.69
Interaction term E x G	0.19	0.10	2.00	0.05	0.20	0.10	0.01	0.42
Interaction term A x G	−0.01	0.12	−0.12	0.90	0.00	0.18	−0.33	0.38
Interaction term E x A x G	−0.03	0.03	−1.25	0.21	−0.02	0.04	−0.09	0.07

Number of bootstrap samples for percentile bootstrap confidence intervals was 5000.

$R^2 = .12$, $F(7, 760) = 12.32$, $p < .001$, $\bar{f}^2 = 0.14$.

have more sexual partners over their lifetime when compared to heterosexual people. Although men revealed a tendency to have more sexual partners over their lifetime in this study, overall the association was insufficient to confirm the results of previous studies (e.g., Geary et al., 2018; Mercer et al., 2013). Women did not differ significantly from men in the number of sexual partners over their lifetime. This may be linked to the specificity of the research group, in which heterosexual individuals prevailed. Tate (2011) found that the number of sexual partners over the lifespan was not related to self-reported sex and bipolar gender identity (masculinity-femininity) in a heterosexual sample. However, Schmitt (2005) found that sex differences in sociosexuality (i.e., individual's willingness to engage in uncommitted sex) were generally large and demonstrated cross-cultural universality across the 48 nations, that may confirm evolutionary theories of human mating strategies.

Burri et al. (2015) found that masculine women are more likely to be nonheterosexual, reporting more sexual partners. Moreover, when masculine women are heterosexual, they also report more sexual partners. Geary et al. (2018) showed that among respondents reporting same-sex sexual

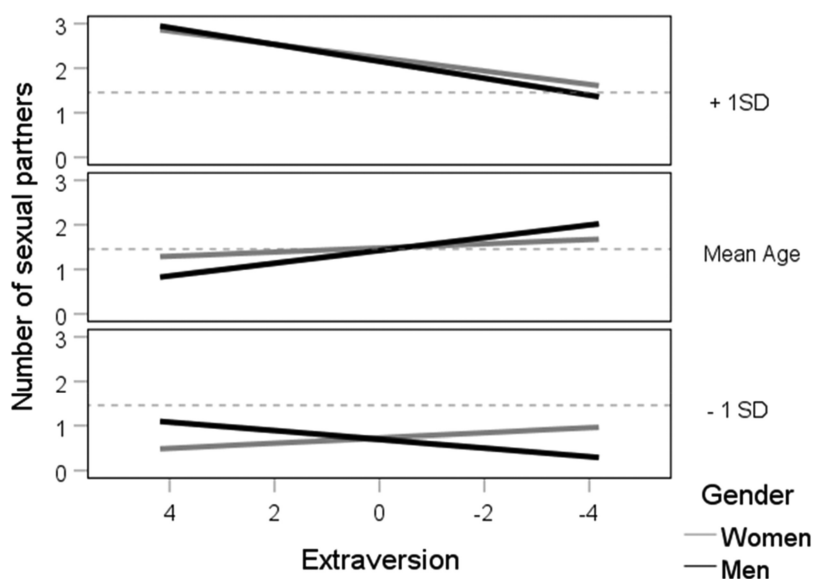


Figure 4. Interaction effect between extraversion and both age and gender on the number of sexual partners over the lifetime.

behaviour in the past 5 years, 28% of men and 45% of women identified as heterosexual. Current study (Bártová et al., 2020) found that there is a positive association of sociosexuality with masculinity in heterosexual women and also with femininity in both heterosexual and homosexual men. Further studies on the relationship between gender and the number of sexual partners should take into account more factors, such as psychological gender and same-sex attraction, among heterosexual participants in particular.

Consistent with the assumptions and previous studies (Allen & Desille, 2017; Allen & Walter, 2018), age, sexual identification, and partially gender were found as predictors of the number of sexual partners in this study. Age revealed a strong positive association with the number of sexual partners in the total sample as well as in all comparing groups of heterosexual and LGB participants. The Nastal-3 study showed similar connections (Clifton et al., 2013; Mercer et al., 2013; Wellings et al., 2019). Also, sexual identification was a significant and strong predictor of the number of sexual partners here, with a greater lifetime number of sexual partners in bisexuals. Because gender does not limit sexual attraction, bisexuals may have more potential sexual partners. Some studies (Mitchell et al., 2014) have shown that amongst the polyamorous and swinger population bisexual women (above 65%) prevailed when compared to homosexual (4%) or heterosexual (16%) women.

The present results are not consistent in term of gender. Gender was not found as a predictor of the number of sexual partners in the first model of regression. But in the second model (with personality traits included), female gender was a weak predictor of the number of sexual partners in the bisexual and total samples. In addition, when gender and sexual identification were included together in the ANOVA, both variables showed effects on the number of sexual partners. As we expected (Geary et al., 2018; Glick et al., 2012; Mercer et al., 2013), men reported higher numbers of lifetime sexual partners (compared to women), while LGB participants declared significantly higher numbers of lifetime sexual partners than heterosexuals. However, no interaction between gender and sexual identification was found. This may be related to individual differences of participants or to cultural differences and the specifics of the Polish minority sample. Greenberg et al. (2010) emphasised that sexuality involves the interrelationship of biological, psychological and sociocultural dimensions.

It is important to note that the higher number of sexual partners among men (when compared to women), found in this and previous studies, may be false result, related to errors of testing. Men may

vary from women in understanding and defining 'sexual intercourse', 'sexual engagement', or 'sexual partner' as well. This may lead to under or overestimate the number of sexual partners. The other possible explanation is that the men who have an infinitive number of sexual partners is not seen as critically by society, as women with high number of sexual partners. The culturally set social roles of mother seem to incline women to the limited number of partners rather, aimed to ensure the safety of offspring. On the other hand, the profession of a prostitute is limited predominantly for women. However, most likely prostitutes are not included in scientific study, what may significantly decrease the number of sexual partners among women.

Personality traits as predictors of the number of sexual partners

The hypotheses about the relationship between personality traits and the number of sexual partners over the lifetime were partially supported in this study. As was expected (Allen & Walter, 2018), extraversion was the best positive predictor of the number of sexual partners, when comparing all the variables included in the model of regression in all samples (total, heterosexual, bisexual and homosexual). Previously, Allen and Walter (2018) found in their meta-analytic study that higher levels of extraversion were associated with greater reported sexual activity. Some researchers have argued (Buss & Greiling, 1999; Nettle, 2006) that individual differences in extraversion are central to understanding sexual behaviours. According to evolutionary models of personality variation in humans, extraversion should have an adaptive value that manifests in more sexual partners and a greater likelihood of sexual infidelity.

Extrovert people show tendencies to experience and exhibit positive affect and desire for social attention, have greater motivation for social contact and present greater excitation and lower inhibition (Allen & Walter, 2018; Wilt & Revelle, 2017). This kind of behaviour may determine the interpersonal attractiveness of extroverts that can facilitate engaging in a new friendship and favour establishing many fleeting relationships of a sexual nature (Lukaszewski & Roney, 2011; Wilt & Revelle, 2017). Because extroverts seek stimulation and like the company of other people, they willingly participate in social gatherings, where they have more opportunity to find sexual partners.

The positive relationship between extraversion and a number of sexual partners was also moderated by gender and age in this study, with a stronger association for men, when compared to women, and older than younger people. This seems consistent with previous studies (Allen & Desille, 2017; Bouchard, Jr. & Loehlin, 2001; Briley & Tucker-Drob, 2014; Rantanen et al., 2007; Soto et al., 2011; Roberts et al., 2006). Among more introverted people, women have more sexual partners than men, whereas, among highly extroverted individuals, the number of sexual partners is higher in men than in women. Further analysis has demonstrated that these associations characterise younger individuals, while older extroverts have more sexual partners than introverts, independent of their gender. However, there is no interaction between extraversion, gender and age.

Extraversion seems to have a stronger biological component than other traits (Eysenck, 1992). Because extraversion is related to reacting more strongly to all forms of positive stimuli (Strelau, 1987), due to specific reward processing and dopaminergic functioning of extroverts, positive biofeedback during acquiring experiences should establish this trait with age (Wilt & Revelle, 2017). Indeed, numerous studies indicate that personality traits change across the lifespan, especially in adulthood, due to the interaction between intrinsic maturation and major life experiences (Bleidorn et al., 2018, 2010; McAdams & Olson, 2010; Specht et al., 2011; Roberts et al., 2006). The results of a meta-analytic study (Roberts et al., 2006) showed that gender had minimal effects on lifetime changes in personality, whereas longer studies and studies based on younger cohorts showed greater change.

In the present study, Intellect/Imagination (openness) was associated positively with the number of sexual partners in the heterosexual sample, but negatively in the homosexual sample, which partially confirms our hypothesis and previous studies (Allen & Desille, 2017; Allen & Walter, 2018). In addition, a weak and positive association was found in this study between emotional

stability and the number of sexual partners, but solely in bisexuals. Moreover, sexual orientation moderated the relation between emotional stability and the number of sexual partners. In contrast to heterosexual participants, bisexual and homosexual individuals reported more sexual partners if they were more emotionally stable. This association was stronger for bisexual people in comparison to the homosexual sample. This result may be related to lower levels of anxiety and uncertainty about sexual orientation in bisexual individuals (when compared to heterosexual and homosexual people), and also to negative attitudes towards social norms which seem to limit self-identification of sexuality.

Bisexual persons may have cognitive flexibility and comfort with ambiguity, likely rooted in their awareness and defiance of societal constraints on gender roles and associated expectations regarding attraction (Mark et al., 2014). Research has indicated that bisexual people view monogamy as less enhancing than homosexual and heterosexual individuals, and similar to uncertain or questioning sexual identification individuals (Mark et al., 2014). Generally, bisexuals as a group appear more willing to question monogamy and consider other alternatives (e.g., polygamy, polyamorousness, pansexuality). The flexibility that allows bisexuals to resist social norms on same-sex attraction may also allow them to question the monogamy norm (Fernandes, 2009).

Agreeableness in this study was negatively related to the number of sexual partners over the lifetime in the total sample and also in the heterosexual and bisexual samples, which is consistent with other studies (Allen & Desille, 2017; Hoyle et al., 2000; Kurpisz et al., 2016). In general, people with low agreeableness do not easily succumb to moral norms. Conversely, individuals who score high on agreeableness and conscientiousness tend to endorse traditional values (Roccas et al., 2002), which leads to avoiding such behaviour as casual sex, sexual risk-taking and sexual infidelity. A monogamous relationship with one sexual partner over the lifespan is one of the demands of the Catholic religion and traditional culture. Because the majority of Polish people remain under the orders of the traditional Catholic religion, we can expect that individuals with a low level of agreeableness, especially those who score low in compliance, altruism, and modesty, may have sex with more partners.

A negative relationship between the number of lifetime sexual partners and conscientiousness was found here in the total and bisexual samples. Allen and Walter (2018) showed that conscientiousness was negatively related to sexual infidelity. Bogg and Roberts (2004) indicated that individuals low in conscientiousness-related traits were more likely to engage in casual sex and large number of sexual partners. In the review study by Hoyle et al. (2000), conscientiousness was negatively related to sexual risk-taking. In contrast, highly conscientious individuals are more anxious and stressed, and experience more health-protective benefits as a result of being more careful, less risky and more concerned with the accumulated effects of their behaviours. They do not engage in risky sexual behaviour or a high number of sexual relationships. In general, higher levels of conscientiousness are related to more conservative attitudes towards sex, lower levels of sexual dysfunction and a greater tendency towards heterosexuality. The present research seems to support these findings.

Conclusion

Summarising, the hypothesis about the association between the lifetime number of sexual partners and personality traits was fully confirmed in this study with regard to extraversion. The best predictor of a higher number of sexual partners is heightened extraversion. Overall, the study confirmed the general direction of association between personality traits and the number of sexual partners that was found in the meta-analytic study by Allen and Walter (2018). Moreover, this association seems also to be dependent on sexual identification, at least to some extent. In particular, sexual identification was found as a moderator of the relation between emotional stability and the number of sexual partners. However, the relationship between the number of sexual partners and gender or sexual

identification is ambiguous. More future research is needed to explain some confusing results in this study.

In considering the results of the current study, several limitations should be noted. Firstly, the results of this study may not be generalised to the whole population. The sample was derived from Internet users. The age of the majority of participants ranged from 16 to 25 years old since older people in the Poland do not use computers and the Internet to such an extent as younger ones. It is important to note that cultural differences related to the Polish population may also occur. Chopik and Kitayama (2018) showed that changes in extraversion, neuroticism and conscientiousness systematically vary across cultures. In addition, emotional stability and extraversion have been found as traits highly sensitive to change as a result of psychotherapeutic intervention (Bucher et al., 2019; Roberts et al., 2017). Thus, cross-cultural research on a larger and more random sample should be performed in the future.

Secondly, among the many methods of measurement, we used short-form questionnaires for personality traits and simple questions to assess sexual identification and number of lifetime sexual partners. Other methods and measurements could be used in the future. In particular, there are many more methods to measure various aspects of sexuality related to sexual behaviour and attitude towards sex. The next limitation is addressed to measure the number of sexual partners. The question do not differentiate what respondent understands as a sexual experience (i.e., sex with or without genital contact, oral sex, sexual intimacy). Thus, the number of sexual partners found in this study may not fully refer to the same as in the other studies.

This study identified the most important factors determining the number of sexual partners, such as age, gender, sexual identity, and Big Five personality traits. However, caution should be used, since in this study a cross-sectional methodology was used. A longitudinal study that targets these associations could better explain the shift from environmental to genetic influences. To examine the association between personality and various dimensions of sexual behaviours (including the number of sexual partners), more research is needed in the future.

The results of this study may be valuable for health professionals targeting the promotion of a healthy sexual life and therapeutics working with couples who have declared sexual problems, and also people at risk of sexual addiction (Allen & Walter, 2018; Reid et al., 2011) or STIs (Falasinnu et al., 2015). This study identified the most important factors determining high number of sexual partners, such as male gender in heterosexual people and female among homosexual and bisexual individuals, also LGB sexual identity in general, and heightened extraversion as a Big-Five personality trait. In addition, a higher number of sexual partners may be expected in younger introvert women and extrovert men and also in older extrovert people independent of their gender. Moreover, emotional stability may predict higher number of sexual partners in LGB people. Clinicians, counsellors and psychotherapists may use this information to select the target sample for prevention and therapy. Also, prevention programmes or Sex Education programs could include the information about extraversion in interaction with gender and age as a risk factor. We believe that it might be also of value to scientists interested in the relationship between sexual behaviour and personality. Understanding individual differences that affect sexual behaviour may be important for theoretical progress in sexual health psychology and personality sciences, as emphasised by Allen and Walter (2018).

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Aleksandra Rogowska  <http://orcid.org/0000-0002-4621-8916>

References

- Allen, M. S., & Desille, A. E. (2017). Personality and sexuality in older adults. *Psychology & Health*, 32(7), 843–859. <https://doi.org/10.1080/08870446.2017.1307373>
- Allen, M. S., & Walter, E. E. (2018). Linking big five personality traits to sexuality and sexual health: A meta-analytic review. *Psychological Bulletin*, 144(10), 1081–1110. <https://doi.org/10.1037/bul0000157>
- Allik, J., Church, A. T., Ortiz, F. A., Rossier, J., Hřebíčková, M., de Fruyt, F., ... McCrae, R. R. (2017). Mean profiles of the NEO personality inventory. *Journal of Cross-cultural Psychology*, 48(3), 402–420. <https://doi.org/10.1177/0022022117692100>
- Bártová, K., Štěrbová, Z., Varella, M. A. C., & Valentova, J. V. (2020). Femininity in men and masculinity in women is positively related to sociosexuality. *Personality and Individual Differences*, 152, 109575. <https://doi.org/10.1016/j.paid.2019.109575>
- Baumert, A., Schmitt, M., & Perugini, M. (2019). Towards an explanatory personality psychology: Integrating personality structure, personality process, and personality development. *Personality and Individual Differences*, 147, 18–27. <https://doi.org/10.1016/j.paid.2019.04.016>
- Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2018). Life events and personality trait change. *Journal of Personality*, 86(1), 83–96. <https://doi.org/10.1111/jopy.12286>
- Bleidorn, W., Kandler, C., Hülshager, U. R., Riemann, R., Angleitner, A., & Spinath, F. M. (2010). Nature and nurture of the interplay between personality traits and major life goals. *Journal of Personality and Social Psychology*, 99(2), 366–379. <https://doi.org/10.1037/a0019982>
- Bogaert, A. F., Ashton, M. C., & Lee, K. (2018). Personality and sexual orientation: extension to asexuality and the hexaco model. *Journal of Sex Research*, 55(8), 951–961. <https://doi.org/10.1080/00224499.2017.1287844>
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin*, 130(6), 887–919. <https://doi.org/10.1037/0033-2909.130.6.887>
- Bouchard, T. J., & Loehlin, J. C. (2001). Genes, evolution, and personality. *Behavior Genetics*, 31(3), 243–273. <https://doi.org/10.1023/A:1012294324713>
- Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, 140(5), 1303–1331. <https://doi.org/10.1037/a0037091>
- Bucher, M. A., Suzuki, T., & Samuel, D. B. (2019). A meta-analytic review of personality traits and their associations with mental health treatment outcomes. *Clinical Psychology Review*, 70, 51–63. <https://doi.org/10.1016/j.cpr.2019.04.002>
- Burri, A., Spector, T., & Rahman, Q. (2015). Common genetic factors among sexual orientation, gender nonconformity, and number of sex partners in female twins: Implications for the evolution of homosexuality. *The Journal of Sexual Medicine*, 12(4), 1004–1011. <https://doi.org/10.1111/jsm.12847>
- Buss, D. M., & Greiling, H. (1999). Adaptive individual differences. *Journal of Personality*, 67(2), 209–243. <https://doi.org/10.1111/1467-6494.00053>
- Chopik, W. J., & Kitayama, S. (2018). Personality change across the lifespan: Insights from a cross-cultural longitudinal study. *Journal of Personality*, 86(3), 508–521. <https://doi.org/10.1111/jopy.12332>
- Clifton, S., Fuller, E., & NatCen, D. P. (2013). *Reference tables of the social research on behalf of the third national survey of sexual attitudes and lifestyles (Natsal-3)*. Retrieved from <http://www.natsal.ac.uk/media/3935/natsal-3-reference-tables.pdf>
- Donnellan, M. B., Baird, B. M., Lucas, R. E., & Oswald, F. L. (2006). The mini-IPIP scales: tiny-yet-effective measures of the big five factors of personality. *Psychological Assessment*, 18(2), 192–203. <https://doi.org/10.1037/1040-3590.18.2.192>
- Donnellan, M. B., Hill, P. L., & Roberts, B. W. (2015). Personality development across the life span: current findings and future directions. In M. Mikulincer, P. R. Shaver, M. L. Cooper, & R. J. Larsen (Eds.), *APA handbooks in psychology. APA handbook of personality and social psychology, vol. 4. Personality processes and individual differences* (pp. 107–126). American Psychological Association.
- Durex,. (2010). *Mean number of sexual partners in selected European countries in 2010*. statista - the statistics portal. Retrieved from <https://www-1statista-1com-1ll3b6r9112d2.han.uni.opole.pl/statistics/232316/mean-number-of-sexual-partners-in-selected-european-countries>.
- Eysenck, H. J. (1992). *A hundred years of personality research, from Heymans to modern times*. Bohn, Staau Van Loghum.
- Fajkowska, M., & Kreidler, S. (2018). Status of the trait concept in contemporary personality psychology: are the old questions still the burning questions? *Journal of Personality*, 86(1), 5–11. <https://doi.org/10.1111/jopy.12335>
- Falasinu, T., Gilbert, M., Salway, T. H., Gustafson, P., Ogilvie, G., & Shoveller, J. (2015). Predictors identifying those at increased risk for STDs: A theory-guided review of empirical literature and clinical guidelines. *International Journal of STD & AIDS*, 26(12), 839–851. <https://doi.org/10.1177/0956462414555930>
- Fernandes, E. M. (2009). The swinging paradigm: an evaluation of the marital and sexual satisfaction of swingers. *Electronic Journal of Human Sexuality*, 12. <https://www.psychologytoday.com/files/attachments/134956/the-swinging-paradigm.pdf>.
- Field, N., Mercer, C. H., Sonnenberg, P., Tanton, C., Clifton, S., Mitchell, K. R., ... Johnson, A. M. (2013). Associations between health and sexual lifestyles in Britain: findings from the third national survey of sexual attitudes and lifestyles (Natsal-3). *Lancet*, 382, 1830–1844. [https://doi.org/10.1016/S0140-6736\(13\)62222-9](https://doi.org/10.1016/S0140-6736(13)62222-9)

- Geary, R. S., Tanton, C., Erens, B., Clifton, S., Prah, P., Wellings, K., ... Mercer, C. H. (2018). Sexual identity, attraction and behaviour in Britain: the implications of using different dimensions of sexual orientation to estimate the size of sexual minority populations and inform public health interventions. *PloS One*, 13(1), e0189607. Retrieved from <https://doi.org/10.1371/journal.pone.0189607>...
- Glick, S. N., Morris, M., Foxman, B., Aral, S. O., Manhart, L. E., Holmes, K. K., & Golden, M. R. (2012). A comparison of sexual behavior patterns among men who have sex with men and heterosexual men and women. *Journal of Acquired Immune Deficiency Syndrome*, 60(1), 83–90. <https://doi.org/10.1097/QAI.0b013e318247925e>
- Goldberg, L. R. (1999). A broad – Bandwidth, public – Domain, personality inventory measuring the lower – Level facets of several five – factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7–28). Tilburg University Press.
- Greenberg, J. S., Bruess, C. E., & Oswalt, S. B. (2010). *Exploring the dimensions of human sexuality*. Jones & Bartlett Publishers.
- Hardin, J. W., & Hilbe, J. M. (2003). *generalized linear models and extension*. Stata Press.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2-nd Ed ed.). Guilford Press.
- Hayes, A. F. (2019). *PROCESS (version 3.3.) [macro for windows and SPSS]*. Retrieved from <http://www.processmacro.org/download.html>
- Hilbe, J. M. (2011). *Negative binomial regression* (2nd ed. ed.). Cambridge University Press.
- Hoyle, R. H., Fejfar, M. C., & Miller, J. D. (2000). Personality and sexual risk taking: A quantitative review. *Journal of Personality*, 68(6), 1203–1231. <https://doi.org/10.1111/1467-6494.00132>
- Kurpisz, J., Mak, M., Lew-Starowicz, M., Nowosielski, K., Bieńkowski, P., Kowalczyk, R., ... Samochowiec, J. Personality traits, gender roles and sexual behaviours of young adult males. (2016). *Annals of General Psychiatry*, 15(1), 28. Retrieved from. <https://doi.org/http://doi.10.1186/s12991-016-0114-2>
- Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, 101(4), 847–861. <https://doi.org/10.1037/a0024298>
- Lukaszewski, A. W., & Roney, J. R. (2011). The origins of extraversion: joint effects of facultative calibration and genetic polymorphism. *Personality and Social Psychology Bulletin*, 37(3), 409–421. <https://doi.org/10.1177/0146167210397209>.
- Mark, K., Rosenkrantz, D., & Kerner, I. (2014). “Bi”ing into monogamy: attitudes toward monogamy in a sample of bisexual-identified adults. *Psychology of Sexual Orientation and Gender Diversity*, 1(3), 263–269. <https://doi.org/10.1037/sgd0000051>
- Matthews, G., Deary, I. J., & Whiteman, M. C. (2003). *Personality traits* (2nd ed. ed.). Cambridge University Press.
- McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. *Annual Review of Psychology*, 61(1), 517–542. <https://doi.org/10.1146/annurev.psych.093008.100507>
- Mercer, C. H. (2014). Sexual behaviour. *Medicine*, 42(6), 291–293. <https://doi.org/doi:10.1016/j.mpmed.2014.03.005>
- Mercer, C. H., Tanton, C., Prah, P., Erens, B., Sonnenberg, P., Clifton, S., ... Johnson, A. M. (2013). Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the national surveys of sexual attitudes and lifestyles (NATSAL). *Lancet*, 382(9907), 1781–1794. [https://doi.org/10.1016/S0140-6736\(13\)62035-8](https://doi.org/10.1016/S0140-6736(13)62035-8)
- Mitchell, M. E., Bartholomew, K., & Cobb, R. J. (2014). Need fulfillment in polyamorous relationships. *Journal of Sex Research*, 51, 329–339. <https://doi.org/10.1080/00224499.2012.742998>
- Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist*, 61(6), 622–631. <https://doi.org/10.1037/0003-066X.61.6.622>
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Assessing moderated mediation hypotheses: theory, methods, and prescriptions. *Multivariate Behavioral Research*, 42(1), 185–227. <https://doi.org/10.1080/00273170701341316>
- Rantanen, J., Metsäpelto, R.-L., Feldt, T., Pulkkinen, L., & Kokko, K. (2007). Long- term stability in the big five personality traits in adulthood. *Scandinavian Journal of Psychology*, 48(6), 511–518. <https://doi.org/10.1111/j.1467-9450.2007.00609.x>
- Reid, R. C., Stein, J. A., & Carpenter, B. N. (2011). Understanding the roles of shame and neuroticism in a patient sample of hypersexual men. *Journal of Nervous and Mental Disease*, 199(4), 263–267. <https://doi.org/10.1097/NMD.0b013e3182125b96>
- Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, 143(2), 117–141. <https://doi.org/10.1037/bul0000088>
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25. <https://doi.org/10.1037/0033-2909.132.1.1>
- Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: theory and research* (pp. 375–398). The Guilford Press.
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. *Personality & Social Psychology Bulletin*, 28(6), 789–801. <https://doi.org/10.1177/0146167202289008>

- Schmitt, D. P. (2005). Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating. *Behavioral and Brain Sciences*, 28(2), 247–275. <https://doi.org/10.1017/S0140525X05000051>
- Schwaba, T., & Bleidorn, W. (2018). Individual differences in personality change across the adult life span. *Journal of Personality*, 86(3), 450–464. <https://doi.org/10.1111/jopy.12327>
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: big five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, 100(2), 330–348. <https://doi.org/10.1037/a0021717>
- Specht, J., Egloff, B., & Schmukle, S. C. (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. *Journal of Personality and Social Psychology*, 101(4), 862–882. <https://doi.org/10.1037/a0024950>
- SPSS. (2019). *IBM SPSS statistics (version 25, PS IMAGO PRO) [software for windows]*. PREDICTIVE SOLUTIONS Sp. z o.o.
- Statistica. (2019). *DELL statistica (version, 13.1) [software for windows]*. StatSoft Polska Sp.z o.o..
- Strelau, J. (1987). Emotion as a key concept in temperament research. *Journal of Research in Personality*, 21(4), 510–528. [https://doi.org/10.1016/0092-6566\(87\)90037-7](https://doi.org/10.1016/0092-6566(87)90037-7)
- Strus, W., Cieciuch, J., & Rowiński, T. (2014). Circumplex structure of personality traits measured with the IPIP-45AB5C questionnaire in Poland. *Personality and Individual Differences*, 71, 77–82. <https://doi.org/10.1016/j.paid.2014.07.018>
- Superdrug (2017). *What's your number?* Retrieved from <https://onlinedoctor.superdrug.com/whats-your-number>.
- Tate, C. (2011). The “problem of number” revisited: the relative contributions of psychosocial, experiential, and evolutionary factors to the desired number of sexual partners. *Sex Roles*, 64(9–10), 644–657. <https://doi.org/10.1007/s11199-010-9774-6>
- Topolewska, E., Skimina, E., Strus, W., Cieciuch, J., & Rowiński, T. (2014). Krótki kwestionariusz do pomiaru wielkiej piątki IPIP-BFM-20 [A short questionnaire for measuring the big five IPIP-BFM-20]. *Annals of Psychology*, 17(2), 367–384. https://www.kul.pl/files/1024/Roczniki_Psychologiczne/2014/2/RPsych2014nr2s385-402_Topolewska_InniEN.pdf
- Tummers, J. H., Derksen, J. L., & van Alphen, S. P. (2010). Instability of personality characteristics and personality disorders during the lifespan: Effects for assessment in older adults. *Tijdschrift Voor Gerontologie En Geriatrie*, 41(2), 87–95. <https://doi.org/10.1007/BF03096187>
- Valentova, J. V., Štěrbová, Z., Bártová, K., & Varella, M. A. C. (2016). Personality of ideal and actual romantic partners among heterosexual and non-heterosexual men and women: A cross-cultural study. *Personality and Individual Differences*, 101, 160–166. <https://doi.org/10.1016/j.paid.2016.05.048>
- Wellings, K., Palmer, M. J., Machiyama, K., & Slaymaker, E. (2019). Changes in, and factors associated with, frequency of sex in Britain: Evidence from three national surveys of sexual attitudes and lifestyles (natsal). *BMJ*, 365, 1525. <https://doi.org/10.1136/bmj.l1525>.
- Wilt, J., & Revelle, W. (2017). Extraversion. In T. A. Widiger (Ed.), *The Oxford handbook of the five factor model* (pp. 57–82). Oxford University Press.
- Wortman, J., Lucas, R. E., & Donnellan, M. B. (2012). Stability and change in the big five personality domains: evidence from a longitudinal study of Australians. *Psychology and Aging*, 27(4), 867–874. <https://doi.org/10.1037/a0029322>