Trends in Psychology
https://doi.org/10.1007/s43076-022-00244-w

ORIGINAL ARTICLE

Sociosexuality and Sexual Behavior in Men During the COVID-19 Pandemic

Mauro Dias Silva Júnior[1] · **Mozer de Miranda Ramos**[2] · **Hellen Vivianni Veloso Corrêa**[3]

Accepted: 20 October 2022

Abstract

Previous studies have shown that unrestricted sociosexuality is part of a quantitative strategy where individuals prioritize the search for multiple partners and is associated with earlier onset of sexual debut, infidelity, reduced sexual disgust, and risk-taking behaviors. Thus, we aimed to investigate the relationship between sociosexuality and sexual risky behaviors during the COVID-19 pandemic due to its potential effects in sexual relationships in a long-standing period of physical distancing. Five hundred eighty-three men completed a series of online questionnaires regarding their sociosexuality, sexual experiences, and adherence to physical distancing recommendations. We found that only a small proportion of the sample had fully adhered to distancing guidelines. Sociosexuality correlated negatively with age at first sexual experience and positively with number of casual partners during the pandemic and frequency of unprotected sex with strangers. Both single and non-heterosexual (gays and bisexuals) men showed higher sociosexuality when compared to men in a relationship and heterosexual ones, respectively. Inconsistent adherence to physical distancing was associated with earlier age of sexual experience, higher number of casual sex, and higher frequency of unprotected sex with strangers. The results indicate that a large proportion of men engaged in some extent in health risk-taking sexual behaviors during the pandemic. As expected, sociosexuality was associated with variables previously found in other studies and with new ones investigated in the present study. We highlight the importance to acknowledge individual differences in response to a long period of distancing and its implications in the welfare of individuals, groups, and the population.

Keyword COVID-19 · Health risky behaviors · Sexual orientations · Adherence to physical distancing · Evolutionary psychology

✉ Mauro Dias Silva Júnior
juniormsilva@unb.br

Extended author information available on the last page of the article

Published online: 15 November 2022

Reproductive strategies are patterns of organized behavior aimed at the reproduction of organisms (Buss & Schmitt, 1993, 2019), even if nowadays not all individuals reproduce, as these strategies were, on average, efficient in producing more descendants in the evolutionary past (Buss & Schmitt, 2019; Fawcett et al., 2013; McNamara & Houston, 2009; Todd & Gigerenzer, 2000). Thus, investigating the multiple motivational systems that favored reproduction under ancestral conditions helps us to understand the human behavior nowadays, even in evolutionarily new situations, including those that present uncertainty and risk, such as the current pandemic due to the SARS-CoV-2 (Pick et al., 2022; Tooby & Cosmides, 2008).

The willingness to engage in sex without commitment, while an evolved motivation, has been extensively studied in recent decades under the label of sociosexuality (Bakker & Walker, 2020; Waldis et al., 2021). It has been evaluated along three domains: the number of sexual partners (behavioral), attitudes related to sex without affective involvement (attitudinal), and the frequency of fantasies and sexual arousal from people with whom you do not have a romantic relationship (desire). Higher levels of sociosexuality indicate people with a greater disposition toward sex without commitment, which means that they are more unrestricted. However, sociosexuality is not a normative measure, and there is no point at which restricted sociosexuality becomes unrestricted sociosexuality. Individuals are categorized as restricted or unrestricted based on the highest scores in the overall ranking made up of the three domains.

Evolutionary studies seek evidence that unrestricted sociosexuality is part of a quantitative sexual strategy where individuals prioritize the search for multiple partners over the formation of bonds with few sexual partners throughout life—a qualitative strategy. Studies carried out around the world show that men tend, on average, to have more unrestricted sociosexuality than women (Arnocky et al., 2016; Koomson & Teye-Kwadjo, 2021; Schmitt, 2005, 2006; Zheng et al., 2013); that is, they have a greater number of sexual partners, more positive attitudes towards uncommitted sex, and have greater sexual desire for people they have just met. Additionally, some studies show that homosexual men are, on average, more unrestricted than heterosexual men, and that the explanation for this lies in the fact that men are primarily more unrestricted than women. When the former relates to each other, sex without commitment is more likely to happen, whereas when they relate to women, who are more restricted, heterosexual men have their sociosexuality moderated by females (Schmitt, 2006). This finding is reinforced by the fact that homosexual and heterosexual men tend to differ in sociosexuality in the domain of behavior, but not always in the domains related to attitudes and desire towards casual sex.

Environmental conditions, such as the presence of pathogens, are known to affect sociosexuality both in and outside laboratory settings (Moran et al., 2021; Schmitt, 2005). A study carried out at the beginning of the COVID-19 pandemic showed that sexual disgust increased significantly with the increase in the perceived risk of infection by SARS-CoV-2 (Hlay et al., 2021), which may limit the frequency of casual sex. Two recent studies found that less sexual disgust was associated with greater sociosexuality and more risky behavior (e.g., having unprotected sex) in dating app users, especially men (Sevi, 2019; Sevi et al., 2018). In addition, dating app users with greater sociosexuality were more

motivated to engage in infidelity and practice more infidelity when using the app (Weiser et al., 2018). Another study found a relationship between life history orientation and preventive health behaviors during the pandemic (Corpuz et al., 2020). Thus, the COVID-19 pandemic is a favorable time to investigate the relationship between sexual behavior and life history strategies in a social context marked by the threat of pathogens and a strong indication of sexual restriction (through the norms of physical distancing) for single people.

It is known that the SARS-CoV-2 pandemic has led to several negative consequences at a global level, affecting, among several psychological aspects, the romantic and sexual relationships that were impacted by the recommendations of physical distancing. The combination of physical distancing recommendations in order to prevent the spread of SARS-CoV-2 with distancing extending over months may have constituted an impasse in the sexual behavior of individuals. These circumstances have led many people to adopt new strategies in order to satisfy their sexual needs, such as the use of the Internet (Eleuteri & Terzitta, 2021). However, due to the nature of sexual and romantic relationships that involve intimacy and physical contact, it is questionable whether those strategies were an option for everyone, particularly for those individuals who adopt a more quantitative sexual strategy involving a wider search for sexual partners.

Sociosexuality is considered a behavioral marker of life history strategies (LHS), serving as an indicator of slower or faster life history strategies (Shiramizu, 2016). Individuals that are more unrestricted have faster strategies, characterized by early sexual initiation, greater number of partners and children, and less risk aversion, whereas the opposite trend is found in individuals that are more restricted. Considering sociosexuality as this marker, it is expected that the more unrestricted individuals also present greater risk behavior as found in previous studies (Ellis et al., 2012; Li et al., 2010; Ramos et al., 2013, 2017; Sevi, 2019). The association between sexual behavior and risky behavior and impulsiveness is also found in experimental studies, in which participants primed with conditions of uncertainty and environmental scarcity displayed a greater or lesser disregard for the future depending on the type of strategy developed in the course of their lives (Griskevicius et al., 2011a, b). Additionally, a recent study showed that higher sociosexuality positively correlates with sexual sensation seeking (Koomson & Teye-Kwadjo, 2021).

The aim of this study was twofold. First, we aimed to test hypotheses regarding the relationship between sociosexuality and sexual risky behavior during the pandemic, which states that faster life histories are associated with risky behaviors. And, second, we aimed to investigate how the adherence to physical distancing guidelines was related to sexual behavior. The impasse between the satisfaction of sexual and romantic needs and the possibility of contamination by SARS-CoV-2 is considered as a chance to study how individuals with different life history strategies can react differently to an environmental condition of common risk. The option to samples only men in this study is justified by the need to investigate intrasexual differences in a more systematic way, given that an excessive focus on intersex differences prevails in the evolutionary literature.

Method

Participants

The study included 583 men, aged between 18 and 70 years. The average age was 28.62 years ($SD = 8.58$). All regions of Brazil were represented, with the Midwest being the region with the most participants (38.1%, $n = 222$), followed by the Northeast (25.7%, $n = 150$), Southeast (22.0%, $n = 128$), South (6.7%, $n = 39$) and North (6.0%, $n = 35$). The Federal District accounted for 35.4% ($n = 204$) of the sample, corresponding to almost all respondents in the Midwest. Participants were mostly undergraduate students (37.4%, $n = 218$), graduate students (23.3%, $n = 136$), and graduates (21.8%, $n = 127$), which indicates this is a sample with a high education level. Ethnic-racial identifications were concentrated among white (55.9%, $n = 326$) and black people (41.9%, $n = 244$). The sample also included Asians (1.4%, $n = 8$) and natives (0.5%, $n = 3$). Cisgender individuals represented 87.6% ($n = 410$) of the valid percentage, while transgender and non-binary individuals represented 5.5% ($n = 26$).

Data Collection Procedures

This survey was approved by the Ethics Committee for Research with Human Beings of the Human Sciences Center of the University of Brasília by CAAE 82,638,118.0.0000.5540. Informed consent was obtained from all individual participants included in the study.

Participants were invited to the survey through advertising on social networks and through contact with acquaintances, who were asked to share the invitation to the survey among friends and relatives who met the criteria of being male and being over 18 years old. There were no exclusion criteria for this survey, although data were collected from participants on the use of medication for anxiety and depression, and HIV seropositivity, but these data were not analyzed in this survey. After clicking on the link provided, participants were redirected to the online platform, where they read the informed consent form, and upon confirming their intention to participate, were given access to the survey instruments. The production of data was carried out from June 30 to October 20, 2020. The moving average of deaths was around 1000 deaths per day in June, and gradually decreased until it reached a negative peak of 500 deaths on average in October (consortium of news outlets based on data from the health state secretariats, 2020). Despite spanning about 3 months, the data represent only a moment of the pandemic, without profound changes in the media and in the behavior of the population in the period.

Instruments

The survey instruments were hosted on an online platform, which could be accessed by computers and smartphones, but without the need to log in. The

data collected in this study are part of a broader project that investigates variables on the sexual behavior of men of different sexual orientations (Silva Júnior et al., 2022). In the present study, participants were asked for socioeconomic and demographic information, such as age, city where they currently live, education level, race/ethnicity, individual and family income, and whether the participant had symptoms of COVID-19 and had been tested for the presence of the virus. As measures of life history strategies, age at first intercourse, age at first intercourse with affective involvement, and sociosexuality were gaged; the latter was assessed using the Brazilian version of the Sociosexual Orientation Inventory-Revised (SOI-R). This scale consists of nine items, grouped into three domains that assess the number of casual sexual partners (behavioral component), the attitudinal dimension towards sex without commitment (attitudinal component), and the frequency with which they are sexually aroused when meeting a new person (desire component). The SOI-R was originally developed in English, and adapted for several languages, including Brazilian Portuguese by Nascimento et al. (2018), and showed satisfactory evidence of reliability and validity. Sociosexuality is considered a behavioral measure of life history strategies, as it is affected by environmental unpredictability and severity (Shiramizu, 2016). Measures of male sexual risk behavior were assessed by the number of people they had sex with without commitment during the quarantine because of COVID-19, how many of the people in the previous item were strangers, and frequency of sex with vaginal or anal penetration without protection with strangers. Finally, the consistency with which the participants were following the physical distancing guidelines was asked.

Data Analysis

Using a statistical software package, descriptive analyses of frequency and mean of all variables were initially generated. Then, *t*-tests were carried out with the relationship status and sexual orientation as independent variables, and then, as dependent variables: (1) age at first sexual experience (*w*), (2) age at first sexual experience with affective involvement (*y*), (3) interval between *w* and *y*, (4) number of casual partnerships during the pandemic, (5) frequency of unprotected sex with strangers, (6) number of different people they have had sex with in the past 12 months, (7) number of different people they have had sex with only once, (8) number of people they have had sex with without being interested in a commitment, and (9) sociosexuality. A 2×2 factorial ANOVA was performed using sociosexuality as the dependent variable and sexual orientation and relationship status as independent variables to verify the properties of the interaction of these variables. One-way ANOVAs were also produced for the same dependent variables used in the *t*-tests, with the way the respondent is following the physical distancing guidelines and the number of strangers they had casual sex with during quarantine as independent variables. We performed Pearson correlations in those continuous variables. Also, we performed chi-squares on the grouping variables previously mentioned.

Hypotheses and Predictions

In order to test whether age of first sexual experience, age of first sex with an affective involvement, and sociosexuality were assessing life histories, we hypothesized that they would correlate with each other. Specifically, we predicted that (a) age of first sex intercourse (*w*) would correlate positively with age at first sex with emotional involvement (*y*) (prediction 1), because this would mean that a later sexual debut is associated with slower life histories; (b) *w* would correlate negatively with sociosexuality (prediction 2), because an earlier sexual debut would be associated with faster histories; (c) *y* would correlate positively with sociosexuality (prediction 3), because a later emotional sexual intercourse with an emotional involvement would be associated with faster life histories; and (d) interval between *w* and *y* would correlate positively with sociosexuality (prediction 4), because greater interval (i.e., postponed sexual intercourse with an emotional involvement) indicates a pursue of faster life histories.

Furthermore, according to the previous studies associating faster life histories with health risky behaviors, we hypothesized that individuals who adopted those strategies, by the means of age of first sexual experience (*w*) and higher sociosexuality, would have more sexual risky behaviors. Specifically, we predicted that (e) sociosexuality would positively correlate with number of casual sex partners during the pandemic (prediction 5); (f) sociosexuality would be positively associated with higher frequency of unprotected sex with strangers (prediction 6); individuals who inconsistently followed physical distancing would (g) have earlier *w* (prediction 7) and (h) have higher sociosexuality (prediction 8).

Results

Heterosexual men comprised 41.3% of the sample ($n=241$), while homosexuals and bisexuals represented 41.7% ($n=243$) and 15.6% ($n=91$), respectively, the remaining 2.4% represent other sexual orientations). The mean age at the first sexual experience for the whole sample was 16.5 years ($SD=3.63$), while the mean age at the first sexual experience in which there was emotional involvement with the partner was 18.8 years ($SD=3.46$). Singles amounted to 56.3% of the sample ($n=328$) and those who were in a relationship amounted to 43.7% ($n=255$).

When asked how many of the people with whom they had casual sex with during the period of physical distancing recommendations were strangers, 44.4% ($n=259$) said they had not had casual sex and 38.3% ($n=223$) said that none were strangers. Other possible answers, such as "some" (4.3%, $n=25$), "half" (3.6%, $n=21$), "most" (1.7%, $n=10$), and "all" (7.7%, $n=45$), were also present. And only 14.2% ($n=83$) admitted not having used a condom in at least one of those relationships.

Only 37.0% ($n=216$) claimed to be fully following healthcare guidelines during the COVID-19 pandemic. At the other end, 15.1% ($n=88$) stated not consistently following (or not following at all) such recommendations. And 47.9% ($n=279$) said they were following them inconsistently. Despite this, only 3.1% ($n=18$) were not concerned about becoming infected with the disease and 12.9% ($n=75$) were

little concerned. Only 16.0% ($n=93$) said they were worried at all times, and 35.8% ($n=209$) often worried. The remainder (32.2%, $n=188$) said they were concerned sometimes.

Table 1 shows the result of the correlations between the continuous variables. Predictions 1, 2, and 4 were confirmed since we found positive correlations between age of first sexual experience (w) and age of first sex with an emotional involvement (y) and between sociosexuality and interval between w and y. Also, we found a negative correlation between w and sociosexuality. However, prediction 3 was not supported since the correlation between y and sociosexuality was non-significant. Additionally, predictions 5 and 6 were confirmed since we found positive correlations between sociosexuality and number of casual sex partners and between sociosexuality and frequency of unprotected sex with strangers.

Using t-tests, significant differences were found between the means of groups according to sexual orientation and relationship status; the results are given in Table 2. Regarding sociosexuality, a 2×2 factorial ANOVA showed that, despite the differences found regarding sexual orientation and relationship status, the interaction between these groups was not significant [$F(1, 571)=1.177$; $p=0.960$]; that is, regardless of sexual orientation, relationship status uniquely had an effect on sociosexuality, and regardless of relationship status, sexual orientation uniquely had an effect on sociosexuality. We found that compared to heterosexual men, non-heterosexual men had significantly higher means in almost all variables, except for age at first sexual experience and frequency of sex without protection. A similar pattern is observed in the comparisons between single men and those in relationships; the former had significantly higher averages for almost all means, except for age at first sexual experience and frequency of unprotected sex with strangers.

Significant differences were also found, using one-way ANOVA, between groups according to the way in which physical distancing recommendations were being followed and the number of people who had casual sex with strangers during quarantine; the significant results are detailed in Table 3. Regarding the way they are following physical distancing recommendations, the groups differed significantly: "consistent" and "inconsistent" ($p=0.012$; Cohen's $d=0.35$) referring to age at first sexual experience (confirming prediction 7); "consistent" and "little consistent" ($p<0.001$; Cohen's d$=0.40$) and "consistent" and "inconsistent" ($p<0.001$; Cohen's $d=0.75$) with respect to the number of casual mates during the pandemic; "consistent" and "little consistent" ($p=0.020$; Cohen's $d=0.23$) and "consistent" and "inconsistent" ($p=0.001$; Cohen's $d=0.66$) regarding the frequency of unprotected sex with strangers. However, sociosexuality did not differ according to adherence of physical distancing recommendations, thus not supporting prediction 8 ($F=0.854$; $p=0.426$).

Regarding the number of people who had casual sex with strangers during the quarantine, the significant differences were between the groups: "none or no sex" and "some or half" ($p<0.001$; Cohen's $d=2.54$) and "none or no sex" and "most or all" ($p<0.001$; Cohen's $d=1.84$) regarding the number of casual partnerships during the pandemic; "none or no sex" and "some or half" ($p=0.001$; Cohen's $d=1.08$) and "none or no sex" and "most or all" ($p=0.015$; Cohen's $d=0.67$) regarding the frequency of unprotected sex with strangers; "none or no sex" and "some or half"

Table 1 Association between sexual orientation, relationship status, compliance with physical distancing recommendations, and the number of strangers

	Correlation coefficient *r*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Age at first sexual experience (*w*)	1	-	-	-	-	-	-	-
(2) age at first sexual experience with affective involvement (*y*)	0.562**	1	-	-	-	-	-	-
(3) Interval between *w* and *y*	−0.504**	0.432**	1	-	-	-	-	-
(4) Number of casual partners during the pandemic	−0.082**	0.040	0.137**	1	-	-	-	-
(5) Frequency of unprotected sex with strangers	−0.046	-0.001	0.045	0.372**	1	-	-	-
(6) Number of different people you have had sex with in the past 12 months	−0.093**	0.051	0.155**	0.573**	0.240**	1	-	-
(7) Number of different people you have had sex with only once	−0.094**	0.089**	0.197**	0.337**	0.094**	0.532**	1	-
(8) Number of people you have had sex with without being interested in a commitment	−0.165**	0.048	0.234**	0.316**	0.139**	0.526**	0.843**	1
(9) Sociosexuality	−0.125**	0.068	0.211**	0.446**	0.181**	0.727**	0.860**	0.861**

**$=p<0.01$; *$=p<0.05$.

Table 2 Means and standard deviations of dependent variables according to sexual orientation and relationship status

Group		*M(SD)*	*t*	*d*	*M(SD)*	*t*	*d*	*M(SD)*	*t*	*d*
		Age at first sexual experience (*w*)			Age at first sexual experience with affective involvement (*y*)			Interval between *w* and *y*		
Sexual Orientation	Heterosexual	16.50 (3.57)	−0.158	-	18.31 (3.56)	−3.218[b]	0.28	1.83 (2.91)	−3.361[b]	0.28
	Non-heterosexual	16.55 (3.69)			19.28 (3.36)			2.77 (3.54)		
		Number of casual partners during the pandemic			Frequency of unprotected sex with strangers			Number of different people you have had sex with in the past 12 months		
Sexual orientation	Heterosexual	0.56 (1.57)	−4.936[a]	0.40	0.34 (1.39)	−1.652	-	1.93 (3.16)	−10.844[a]	0.83
	Non-heterosexual	1.35 (2.24)			0.55 (1.71)			6.34 (6.41)		
		Number of different people you have had sex with only once			Number of people you have had sex with without being interested in a commitment			Sociosexuality		
Sexual orientation	Heterosexual	5.80 (6.84)	−9.959[a]	0.83	7.12 (7.65)	−7.488[a]	0.63	42.92 (19.99)	−11.243[a]	0.93
	Non-heterosexual	11.93 (7.82)			12.02 (7.88)			63.15 (22.98)		
		Age at first sexual experience (*w*)			age at first sexual experience with affective involvement (*y*)			Interval between *w* and *y*		
Relational status	Single	16.55 (3.94)	0.360	-	19.18 (3.77)	2.441[c]	0.21	2.67 (3.66)	2.268[c]	0.19
	In a relationship	16.44 (3.19)			18.48 (3.01)			2.04 (2.82)		
		Number of casual partnerships during the pandemic			Frequency of unprotected sex with strangers			Number of different people you have had sex with in the past 12 months		
Relational status	Single	1.43 (2.27)	6.152[a]	0.49	0.51 (1.58)	0.946	-	6.23 (6.33)	9.662[a]	0.76
	In a relationship	0.47 (1.44)			0.38 (1.57)			2.18 (3.67)		
		Number of different people you have had sex with only once			Number of people you have had sex with without being interested in a commitment			Sociosexuality		
Relational status	Single	10.53 (8.04)	4.114[a]	0.34	10.68 (8.07)	2.446[c]	0.21	60.30 (24.16)	6.994[a]	0.58
	In a relationship	7.83 (7.73)			9.02 (8.12)			47.08 (21.38)		

a = $p < 0.001$; b = $p < 0.01$; c = $p < 0.05$.

Table 3 Differences between groups according to the way in which physical distancing recommendations were being followed and the number of people who had casual sex with strangers

Group	*M(SD)*	*F*	η^2	*M(SD)*	*F*	η^2	*M(SD)*	*F*	η^2
Way you are following physical distancing recommendations	Age at first sexual experience			Number of casual partners during the pandemic			Frequency of unprotected sex with strangers		
Consistent	17.01 (3.65)	4.080[c]	0.014	0.46 (1.43)	18.772[a]	0.061	0.16 (0.89)	11.246[a]	0.037
Little consistent	16.33 (3.70)			1.15 (1.95)			0.48 (1.69)		
Inconsistent	15.79 (3.18)			1.92 (2.86)			1.09 (2.21)		
Number of strangers you had casual sex with during quarantine	Number of casual partnerships during the pandemic			Frequency of unprotected sex with strangers			Number of different people you have had sex with in the past 12 months		
None or did not have casual sex	0.46 (1.28)	164.893[a]	0.362	0.25 (1.22)	28.072[a]	0.088	3.36 (4.69)	66.682[a]	0.187
Some or half of them	4.10 (2.54)			1.76 (2.60)			11.04 (6.73)		
Most or all of them	3.23 (2.80)			1.18 (2.36)			8.62 (7.70)		
	Number of different people you have had sex with only once			Number of people you have had sex with without being interested in a commitment			Sociosexuality		
None or did not have casual sex	8.40 (7.74)	22.425[a]	0.072	9.13 (8.01)	16.486[a]	0.054	50.95 (22.37)	35.759[a]	0.110
Some or half of them	15.28 (6.93)			15.30 (6.45)			75.00 (23.06)		
Most or all of them	12.73 (8.30)			12.73 (8.19)			68.69 (23.94)		

a = $p < 0.001$; b = $p < 0.01$; c = $p < 0.05$.

($p < 0.001$; Cohen's $d = 1.57$) and "none or no sex" and "most or all" ($p < 0.001$; Cohen's $d = 1.06$) regarding the number of different people you had sex with in the past 12 months; "none or no sex" and "some or half" ($p < 0.001$; Cohen's $d = 0.90$) and "none or no sex" and "most or all" ($p = 0.001$; Cohen's $d = 0.56$) regarding the number of different people with whom you have had sex only once; "none or no sex" and "some or half" ($p < 0.001$; Cohen's $d = 0.78$) and "none or no sex" and "most or all" ($p = 0.008$; Cohen's $d = 0.45$) regarding the number of people you have had sex with without being interested in commitment; and "none or no sex" and "some or half" ($p < 0.001$; Cohen's $d = 1.07$) and "none or no sex" and "most or all" ($p < 0.001$; Cohen's $d = 0.79$) regarding sociosexuality.

Finally, independence chi-squares were used to verify the association between sexual orientation, relationship status, compliance with social isolation recommendations, and the number of strangers they had casual sex during quarantine. The results showed that there was an association between sexual orientation and the number of strangers they had casual sex during quarantine (χ^2 (2) = 19.924; $p < 0.001$; $V = 0.186$). Analyses of the adjusted standardized residuals showed that all ranges of the number of strangers were associated with sexual orientation, in which the heterosexual category was only associated with the "none or no sex" category. Heterosexuals were also more associated with the group that was in a relationship (χ^2 (1) = 36.590; $p < 0.001$; $V = 0.252$). However, there was no association between sexual orientation and compliance with social isolation recommendations (χ^2 (2) = 5.390; $p = 0.068$).

Relationship status was associated with the number of strangers they had casual sex with during quarantine (χ^2 (2) = 29.167; $p < 0.001$; $V = 0.224$). Analyses of the adjusted standardized residuals showed that all ranges of the number of strangers were associated with relationship status, where the category of individuals in a relationship was associated only with the "none or no sex" category. In spite of that, the relationship status was not associated with compliance with social isolation recommendations (χ^2 (2) = 2.657; $p = 0.265$). Compliance with those recommendations was associated with the number of strangers they had casual sex with during quarantine (χ^2 (4) = 35.159; $p < 0.001$; $V = 0.246$). Analyses of the adjusted standardized residuals showed that some ranges of the number of strangers were associated with compliance with the physical distancing recommendations, and the category "none or no sex" was associated with both "consistent" and "inconsistent" compliance. The category "some or half" was also associated with both "consistent" and "inconsistent" compliance.

Discussion

Reproductive strategies such as early sexual initiation and the search for many sexual partners are part of more global quantitative strategies related to human development, known as fast life history strategies—LHS (Patch & Figueredo, 2017; Schmitt, 2005, 2006; Sevi et al., 2018). Different psychological dimensions make up these strategies, such as activation of the stress system, mating, decision-making, health, personality, and parenthood (Brüne et al., 2003, 2012; Del Giudice, 2014;

Del Giudice et al., 2011; Griskevicius et al., 2011a, b; Jonason et al., 2012; Kenrick et al., 2010; Li et al., 2010; Wilson & Daly, 2004). LHS are offsetting processes that arise in response to the demands of the environment, which signaled, in the evolutionary past, opportunities and challenges to fitness. Specifically, faster LHS are adaptive in contexts of unpredictability and environmental severity, in which a greater search for sensations, less negative attitudes towards risks, greater responsiveness to rewards, less harm prevention, and a greater number of sexual partners develop (Brumbach et al., 2009; Patch & Figueredo, 2017; Richardson et al., 2017). Faster LHS are associated with earlier reproduction, greater number of partners, and less stable relationships, while slower LHS, conversely, are associated with incorporated capital (Giudice et al., 2015; Prokosch & Corrigan, 2021; Wang et al., 2021).

Sociosexuality consistently tends to be greater in men than in women and tends to be greater in gay and bisexual men than in heterosexual men (Schmitt, 2006). Other studies replicated these findings in experimental settings, where men were primed with conditions of abundance or scarcity of sexual partners available (Arnocky et al., 2016). Additionally, a study including over 14,000 people in 48 countries identified that sociosexuality in both sexes varied depending on environmental conditions, such as the sex ratio (proportion of women to men in a given population), the presence of pathogens in the environment, greater permissiveness to casual sex and greater participation of women in political and ministerial positions, less income inequality between women and men, use of contraceptives, and more progressive sex role ideologies (Schmitt, 2005).

In addition to sociosexuality, several other variables measured in this study are indicators of LHS, such as the first sexual experience, the number of partners, and the frequency of sex with strangers compose the group of variables that can characterize such strategies. Furthermore, they can be interpreted as indicators of sexual risk behavior. The relationship between fast life strategies and a "taste for risk" has been previously pointed out in other studies (Ellis et al., 2009, 2012; Griskevicius et al., 2011a, b; Li et al., 2010; Mishra et al., 2017; Ramos et al., 2013, 2017).

In our study, non-heterosexual men, as well as single men, displayed greater sociosexuality, and a later age for first sexual experience with affective involvement, more casual sexual mates during the COVID-19 pandemic, greater number of sexual partners in the past 12 months, greater number of sexual encounters with people with whom they had sex only once, and a greater number of partners with whom they had sex without being interested in commitment. These associations are held even after controlling for participants' sexual orientation or relationship status. Additionally, individuals who reported not having casual sex with strangers during the pandemic had fewer casual sexual partners during the COVID-19 pandemic, fewer sexual partners in the past 12 months, fewer partners who have had sex only once, fewer partners with whom they had sex without being interested in commitment, less unprotected sex with strangers, and lower sociosexuality.

Thus, in this study belonging to the group of single men or to the group of non-heterosexual men was more associated with an increased risk sexual behavior and to a faster life history orientation. These results indicate a greater need for care by healthcare policies and healthcare professionals toward those groups, in view of the increased probability of exposure to sexually transmitted infections and, specifically

in this study, to COVID-19 contagion (or transmission). Since intimate contact is necessary for the practice of sex, casual sex entails a high probability of viral transmission when done with partners without a recognized history of care and compliance with social isolation guidelines. This practice thus poses a risk for one's own health and life.

As they are more oriented to the present, in higher risk environments, individuals with faster strategies are less risk averse, even if that jeopardizes their immediate survival or social norms (de Baca et al., 2016; Mishra et al., 2017). There is an association between fast life history and socially antagonistic behaviors (Wenner et al., 2013). One study found that individuals with faster LHS were less likely to endorse precautionary measures in relation to the COVID-19 pandemic (Corpuz et al., 2020), exposing themselves more to risk and calling into question collective care behaviors. These results are in line with the findings of our study, given the associations found between faster strategies and less engagement with physical distancing recommendations. During the period in which the questionnaires were answered, the situation of contagion and death by COVID-19 was not under control. Half of the data were collected during the peak period at that point, and the other half at a time with a significant drop in official numbers. Still, there were hundreds of deaths each day and thousands of newly infected people, plus full hospitals and expert advice not to slack off on care. In any of these scenarios, the frequency of casual sex (especially with strangers) in the pandemic indicated risky behavior and non-compliance with prosocial guidelines.

Conversely, participants who comprised the group that indicated that they were consistently following the guidelines of social isolation, had significantly later first sexual intercourse, fewer sexual partners during the pandemic, and fewer sexual intercourses without wearing protection. This is another indication that slower strategies are associated with behaviors that are more risk safe during the COVID-19 pandemic, even in a self-report indicator like this. In addition, there was no association between sexual orientation and relationship status to compliance with physical distancing norms, which is, therefore, complementary evidence to that presented above. This provides an additional support for the association between LHS and behaviors performed during the pandemic period. In summary, the results demonstrate a clear contrast between the quantitative and qualitative strategies of the participants, which was expressed not only in sociosexuality, a recognized behavioral marker of LHS, but also in the inconsistent compliance with physical distancing rules during the COVID-19 pandemic.

The trends in opposite directions in the different groups indicate the existence of the fast-slow continuum, in which some individuals had greater characteristics of faster LHS, while others had greater characteristics of slower LHS (Del Giudice, 2014, 2020; Del Giudice et al., 2011). LHS are a set of characteristics that covariate, such as early sexual initiation, greater sexual restriction, and greater disregard for the future (impulsiveness). Recently, the notion of a fast-slow continuum has been criticized in life history theory studies, mainly for not showing the tradeoffs inherent to reproductive decisions (e.g., qualitative versus quantitative strategy) (Nettle & Frankenhuis, 2020; Sear, 2020; Stearns & Rodrigues, 2020). However, our study was able to overcome the limitations pointed out by identifying not only the

covariation between different psychological aspects (sexual behavior and inconsistent compliance with distancing rules), but also evidenced the tradeoff between the qualitative and quantitative strategy by identifying the association between inconsistent compliance with distancing and age at first sexual intercourse; and the number of casual sexual partners during the pandemic and the frequency of unprotected sex with strangers during the pandemic. Considering that these results were found during a global epidemic situation, this is an unprecedented result.

Studies show that dating app users exhibit less sexual disgust, tend to be more sociosexually unrestricted, and take more risks (Sevi, 2019; Sevi et al., 2018), two proxies of a quantitative strategy. Additionally, a recent study assessed pathogen disgust and sexual disgust in four countries, including Brazil, during the onset of the pandemic (April 2020), revealing that, in all countries, sexual disgust increased significantly with the increase in perceived risk of SARS-CoV-2 infection (Hlay et al., 2021). Although disgust was not investigated in our study, only a portion of our participants engaged in risky behavior, which can be explained by the fact that adverse environmental conditions are not homogeneously experienced by different people. As mentioned earlier, individuals with faster LHS tend to be more at risk and be more unrestrained, even if they are experimentally primed with the same stimuli as individuals with slow LHS (Griskevicius et al., 2011a, b). Future research should jointly analyze sociosexuality, the feeling of disgust, and risk-taking in situations of contagion by communicable diseases such as that of the Covid-19 pandemic.

It is noteworthy that the absence of differences between groups of men in the domains of attitude and desire reinforces the idea that, regardless of sexual orientation or historical living conditions, men had similar perceptions about casual sex without commitment and the degree of sexual arousal when meeting a new person. Therefore, the differences between them in the total sociosexuality score are exclusively due to differences in the behavior domain, which in turn may reveal that they have different opportunities regarding casual sex, such as the fact that gay and bisexual men relate to other men who are equally willing to have sex without commitment (Schmitt, 2006). However, it is known that non-heterosexual men, because they have to hide their sexual orientation, have sneak dates in bars and nightclubs and dating apps, which can be more conducive to the formation of casual sex than to long-term relationships. In contrast, heterosexuals enjoy greater freedom to form relationships in tolerant and public situations.

Interestingly, the category of individuals who stated that only "some or half" of the people they had casual sex during the quarantine were strangers showed higher averages than those who stated that the strangers were "most or all" in the number of casual partners, frequency of unprotected sex, number of people they had sex with in the past 12 months, number of people they had sex with just once, amount of people they had sex with without being interested in commitment, and sociosexuality. It is noteworthy that these analyses had the largest effect sizes found in this study (Table 3). This apparently contradictory result may be due to the fact that the participants who stated that they had casual sex with strangers in most or all of the opportunities were individuals who were opportunistic in their strategies, that is, they had few casual sex events with strangers, and this corresponds to every opportunity that presented itself. In contrast, individuals who reported having casual sex with

strangers with some or half of the people were more consistent strategists at having casual sex during quarantine with both acquaintances and strangers. This result reveals the potential of a long-term pandemic, such as the COVID-19 one, to create possibilities for people with less propensity for risky behavior, in a few opportunities, to become contaminated by COVID-19. Even the latter stated on average to have done it without protection with an average of 1.18 people, which may also increase the likelihood of STI contamination.

As predicted by previous studies (Nascimento et al., 2018; Schmitt, 2005), sociosexuality correlated strongly and positively with the number of people with whom they had sex only once and with the amount of people they had sex with without being interested in a commitment. These measures compose of what is assessed by sociosexuality, which explains the strong association. As for the number of partners who had sex during the pandemic and the number of partners who had sex in the past 12 months, the correlation was positive and moderate. When it comes to behavior during the pandemic, sociosexuality is not the only component present, which matches the moderate forces found. Despite sociosexuality was weakly associated with unprotected sex, this association was in the expected direction once unprotected sex is a health risky behavior. The age of the first sexual intercourse and the variable that considers the interval between this and the first sexual intercourse with affective involvement had also a moderate positive correlation. The early start of sexual life and the interval until the first sexual intercourse with affective involvement seem to be relatively relevant indicators for sociosexuality and for the identification of fast strategies, as indicated by other studies (Lawn et al., 2020; Simpson et al., 2012; Waldron et al., 2015).

It is important to stress that non-heterosexual individuals showed, significantly, a longer interval until they had their first sexual intercourse with affective involvement, compared to heterosexuals. Regarding age at first sexual intercourse, no difference was found. The sexual development of sexual minorities is marked by stressors that are not shared by hegemonic groups, such as heterosexuals. Society's prejudice, the use of concealment of sexual orientation as a protective strategy during youth, and the break with expectations of compulsory heterosexuality are some of the elements that contribute to this result. Due to lack of evidence, it is still not possible to state that the social stimulus for reaching this milestone of sexual development later in life works as an incentive to sociosexuality and the adoption of faster life strategies. However, this is a hypothesis that deserves attention from longitudinal studies on sexual development.

Another factor that needs to be considered in the context of these results is that non-heterosexual individuals systematically experience contact with stressors that are not shared with heterosexuals. The minority stress theory shows that continued exposure to the stigma, in its different formats and its repercussions, can produce negative outcomes for mental health, such as depression, anxiety, and suicidal ideation (Meyer & Frost, 2013; Paveltchuk & Borsa, 2020). However, such repercussions can also be behavioral, such as engaging in risky behavior (including sexual ones) and substance use/abuse (Hamilton & Mahalik, 2009; Mustanski et al., 2007; Ogunbajo et al., 2020; Rood et al., 2018). Thus, the negative results exhibited by the non-heterosexual men in this study need to be interpreted in light of the predictors

of those behaviors. Potentially risky sexual practices performed by this group are also one of the effects of chronically experiencing stigma and rejection, which are structural in society. This analysis is necessary so as not to amplify prejudice about these gay and bisexual people and individualize the problem.

It is important to highlight, however, that this study also has some limitations. The first relates to the socioeconomic characteristics of the sample, such as being predominantly young, cisgender, and highly educated sample. The researchers sought to devise strategies to increase sample diversity through more inclusive outreach so that minority populations felt comfortable participating. The smaller proportion of this population may be due to the online strategy having been chosen, which may favor some groups, or to the fact that the sample was selected for convenience. Another limitation is due to the fact that self-report studies have limitations, such as relying exclusively on the participants' description of their own behavior. Although participants were explicitly informed that they would not be identified, we cannot completely eliminate the possibility of social desirability bias in not reporting potential sexually risky behaviors.

Despite these limitations, the study reveals relevant information about the sexual behavior of the male population regardless of sexual orientation and gender identity, which were actively included in the research. It is also important to highlight that the study offers results on the risky sexual behavior of men during the COVID-19 pandemic at a time when vaccines were not being negotiated and that the only preventive measures were physical distancing, the wearing of masks, and the use of alcohol gel. Additionally, the study not only confirms previously conducted research on behavioral differences between men of different sexual orientations, but also, in an original way, was able to identify possible tradeoffs related to the theory of life history in humans and the fast-slow continuum in a current context of health emergency. Finally, the effect sizes found involving the variables sexual orientation and number of unknown people who had casual sex during the pandemic indicate a greater degree of reliability that these variables affected the variables of interest to the survey, and therefore justify the need for attention to the care needs of the non-heterosexual minority group.

Conclusion

The context of a long-standing global pandemic in the absence of vaccines proved to be an opportunity to investigate how individuals with different developmental trajectories dealt with fulfilling sexual motivations. Once physical distancing was strongly recommended as an effective way of protection against infection by Sars-Cov-2, months of distancing (and a troubled social and health context) posed a tradeoff between secure health, and maybe life, and satisfying sexual motivations (Ramos et al., 2022). As predicted, individuals with faster strategies presented more sexual risky behaviors than those with slower strategies; this was also true for non-heterosexuals and singles. Correspondingly, inconsistent adherence of recommendations was associated with increased sexual risky behaviors. Therefore, the results found in this study were in the expected direction predicted by the literature of human life

histories (Corpuz et al., 2020; Del Giudice, 2014, 2020; Ellis et al., 2009, 2012; Lawn et al., 2020; Sevi, 2019).

However, these results not only address theoretical questions regarding how individuals differ in the way they respond to a common threat in the environment, but also on how they might expose themselves to a greater risk in those conditions, such as a pandemic. When during a pandemic, individuals differ in wiliness to casual sex, frequency of sex with strangers and unprotected sex, they are more exposed of getting infected and also more likely of infecting others. If the pandemic itself did not restrain all individuals to adopt sexual risky behaviors, governments should find new solutions to encourage less adherents to comply with protective behaviors. Considering that in case of risky behavior, successful interventions may depend on working with, instead of against, evolved motivations (Ellis et al., 2012), we hope these results might help the development of effective strategies seeking to reach a more diversified public.

Author Contribution Mauro Dias Silva Junior and Hellen Vivianni Veloso Corrêa contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Mauro Dias Silva Júnior, Mozer de Miranda Ramos, and Hellen Vivianni Veloso Corrêa. The first draft of the manuscript was written by Mauro Dias Silva Junior and Mozer Ramos. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data Availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Ethics approval This study was performed in line with the principles of the Declaration of Helsinki. This research was approved by the Ethics Committee for Research with Human Beings of the Human Sciences Center of the University of Brasília by CAAE 82638118.0.0000.5540.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

References

Arnocky, S., Woodruff, N., & Schmitt, D. (2016). Men's sociosexuality is sensitive to changes in mate availability. *Personal Relationships, 23*, https://doi.org/10.1111/pere.12118

Bakker, A. J., & Walker, B. R. (2020). Sex drive and sociosexuality moderated by gender identity and gender identity fluidity. *Personality and Individual Differences, 159*(1), 1–5. https://doi.org/10.1016/j.paid.2020.109884

Brumbach, B. H., Figueredo, A. J., & Ellis, B. J. (2009). Effects of harsh and unpredictable environments in adolescence on development of life history strategies: A longitudinal test of an evolutionary model. *Human Nature, 20*(1), 25–51. https://doi.org/10.1007/s12110-009-9059-3

Brüne, M., Belsky, J., FaBrega, H., FeierMan, J. R., Gilbert, P., Glantz, K., PoliMeni, J., Price, J. S., Sanjuan, J., Sullivan, R., Troisi, A., & Wilson, D. R. (2012). The crisis of psychiatry – insights and prospects from evolutionary theory. *World Psychiatry, 11*(1), 55–57. https://doi.org/10.1016/j.wpsyc.2012.01.009

Brüne, M., Ribbert, H., & Schiefenhövel, W. (Orgs.). (2003). The social brain: Evolution and pathology. Wiley.

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

Buss, D. M., & Schmitt, D. P. (2019). Mate Preferences and Their Behavioral Manifestations. *Annual Review of Psychology, 70*(1), 77–110. https://doi.org/10.1146/annurev-psych-010418-103408

Consórcio de veículos de imprensa a partir de dados das secretarias estaduais de Saúde [Consortium of news outlets based on data from the health state secretariats]. (2020). Mortes e casos de coronavírus nos estados | Coronavírus. G1 (Withheld Income Tax). http://especiais.g1.globo.com/bemestar/coronavirus/estados-brasil-mortes-casos-media-movel/?_ga=2.221379483.201362108.1631642476-b898754e-d9df-4c83-759c-c9b59e5f1a01

Corpuz, R., D'Alessandro, S., Adeyemo, J., Jankowski, N., & Kandalaft, K. (2020). Life history orientation predicts COVID-19 precautions and projected behaviors. *Frontiers in Psychology, 11*, 1857.

de Baca, T. C., Wahl, R. A., Barnett, M. A., Figueredo, A. J., & Ellis, B. J. (2016). Adversity, adaptive calibration, and health: The case of disadvantaged families. *Adaptive Human Behavior and Physiology, 2*(2), 93–115.

de Ramos, D. O., Seidl-de-Moura, M. L., & Pessoa, L. F. (2013). Achievement Goals of Youngsters in Rio de Janeiro in Different Contexts. *Paidéia (Ribeirão Preto), 23*(56), 321–328. https://doi.org/10.1590/1982-43272356201306

Del Giudice, M. (2014). An Evolutionary Life History Framework for Psychopathology. *Psychological Inquiry, 25*(3–4), 261–300. https://doi.org/10.1080/1047840X.2014.884918

Del Giudice, M. (2020). Rethinking the fast-slow continuum of individual differences. *Evolution and Human Behavior, 41*(6), 536–549. https://doi.org/10.1016/j.evolhumbehav.2020.05.004

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The adaptive calibration model of stress responsivity. *Neuroscience & Biobehavioral Reviews, 35*(7), 1562–1592. https://doi.org/10.1016/j.neubiorev.2010.11.007

Eleuteri, S., & Terzitta, G. (2021). Sexuality during the COVID-19 pandemic: The importance of Internet. *Sexologies, 30*(1), e55–e60. https://doi.org/10.1016/j.sexol.2020.12.004

Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature, 20*(2), 204–268. https://doi.org/10.1007/s12110-009-9063-7

Ellis, B. J., Del Giudice, M., Dishion, T. J., Figueredo, A. J., Gray, P., Griskevicius, V., Hawley, P. H., Jacobs, W. J., James, J., Volk, A. A., & Wilson, D. S. (2012). The evolutionary basis of risky adolescent behavior: Implications for science, policy, and practice. *Developmental Psychology, 48*(3), 598–623. https://doi.org/10.1037/a0026220

Fawcett, T. W., Hamblin, S., & Giraldeau, L.-A. (2013). Exposing the behavioral gambit: The evolution of learning and decision rules. *Behavioral Ecology, 24*(1), 2–11. https://doi.org/10.1093/beheco/ars085

Giudice, M. D., Gangestad, S. W., & Kaplan, H. S. (2015). Life history theory and evolutionary psychology. The handbook of evolutionary psychology, 1–27.

Griskevicius, V., Delton, A. W., Robertson, T. E., & Tybur, J. M. (2011a). Environmental contingency in life history strategies: The influence of mortality and socioeconomic status on reproductive timing. *Journal of Personality and Social Psychology, 100*(2), 241. https://doi.org/10.1037/a0021082

Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011b). The influence of mortality and socioeconomic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology, 100*(6), 1015. https://doi.org/10.1037/a0022403

Hamilton, C. J., & Mahalik, J. R. (2009). Minority stress, masculinity, and social norms predicting gay men's health risk behaviors. *Journal of Counseling Psychology, 56*(1), 132–141. https://doi.org/10.1037/a0014440

Hlay, J. K., Albert, G., Batres, C., Richardson, G., Placek, C., Arnocky, S., Lieberman, D., & Hodges-Simeon, C. R. (2021). The evolution of disgust for pathogen detection and avoidance. *Scientific Reports, 11*(1), 13468. https://doi.org/10.1038/s41598-021-91712-3

Jonason, P. K., Webster, G. D., Schmitt, D. P., Li, N. P., & Crysel, L. (2012). The antihero in popular culture: Life history theory and the dark triad personality traits. *Review of General Psychology, 16*(2), 192–199. https://doi.org/10.1037/a0027914

Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the Pyramid of Needs: Contemporary Extensions Built Upon Ancient Foundations. *Perspectives on Psychological Science, 5*(3), 292–314. https://doi.org/10.1177/1745691610369469

Koomson, F., & Teye-Kwadjo, E. (2021). How much do we really know about sociosexuality in Ghana. *Sexuality & Culture, 25*(1), 167–188. https://doi.org/10.1007/s12119-020-09764-y

Lawn, R. B., Sallis, H. M., Wootton, R. E., Taylor, A. E., Demange, P., Fraser, A., Penton-Voak, I. S., & Munafò, M. R. (2020). The effects of age at menarche and first sexual intercourse on reproductive and behavioural outcomes: A Mendelian randomization study. *PLoS One, 15*(6), e0234488. https://doi.org/10.1371/journal.pone.0234488

Li, N. P., Smith, A. R., Griskevicius, V., Cason, M. J., & Bryan, A. (2010). Intrasexual competition and eating restriction in heterosexual and homosexual individuals. *Evolution and Human Behavior, 31*(5), 365–372. https://doi.org/10.1016/j.evolhumbehav.2010.05.004

McNamara, J. M., & Houston, A. I. (2009). Integrating function and mechanism. *Trends in Ecology & Evolution, 24*(12), 670–675. https://doi.org/10.1016/j.tree.2009.05.011

Meyer, I. H., & Frost, D. M. (2013). Minority stress and the health of sexual minorities. In C. J. Patterson & A. R. D'Augelli (Eds.), *Handbook of psychology and sexual orientation* (pp. 252–266). Oxford University Press.

Mishra, S., Templeton, A. J., & Meadows, T. J. (2017). Living, fast and slow: Is life history orientation associated with risk-related personality traits, risk attitudes, criminal outcomes, and gambling? *Personality and Individual Differences, 117*, 242–248.

Moran, J. B., Kerry, N., Goh, J. X., & Murray, D. R. (2021). Parasites and promiscuity: Acute disease salience leads to more restricted sexual attitudes. *Journal of Social and Personal Relationships, 38*(11), 3333–3349. https://doi.org/10.1177/02654075211030999

Mustanski, B., Garofalo, R., Herrick, A., & Donenberg, G. (2007). Psychosocial health problems increase risk for HIV among urban young men who have sex with men: Preliminary evidence of a syndemic in need of attention. *Annals of Behavioral Medicine, 34*(1), 37–45.

Nascimento, B. S., Hanel, P. P. H., Monteiro, R. P., Gouveia, V. V., & Little, A. C. (2018). Sociosexuality in Brazil: Validation of the SOI-R and its correlates with personality, self-perceived mate value, and ideal partner preferences. *Personality and Individual Differences, 124*, 98–104. https://doi.org/10.1016/j.paid.2017.12.007

Nettle, D., & Frankenhuis, W. E. (2020). Life-history theory in psychology and evolutionary biology: One research programme or two? *Philosophical Transactions of the Royal Society b: Biological Sciences, 375*(1803), 20190490. https://doi.org/10.1098/rstb.2019.0490

Ogunbajo, A., Iwuagwu, S., Williams, R., Biello, K. B., Kahler, C. W., Sandfort, T. G., & Mimiaga, M. J. (2020). Experiences of minority stress among gay, bisexual, and other men who have sex with men (GBMSM) in Nigeria, Africa: The intersection of mental health, substance use, and HIV sexual risk behavior. *Global public health*, 1–15.

Patch, E. A., & Figueredo, A. J. (2017). Childhood stress, life history, psychopathy, and sociosexuality. *Personality and Individual Differences, 115*, 108–113. https://doi.org/10.1016/j.paid.2016.04.023

Paveltchuk, F. O., & Borsa, J. C. (2020). A teoria do estresse de minoria em lésbicas, gays e bissexuais. *Revista Da SPAGESP, 21*(2), 41–54.

Pick, et al. (2022). Fundamental social motives measured across forty-two cultures in two waves. *Nature, 9*(499), 1–12. https://doi.org/10.1038/s411597-022-01579-w

Prokosch, M. L., & Corrigan, E. (2021) Fast Versus Slow Strategies. In: Weekes-Shackelford V., Shackelford T., Weekes-Shackelford V. (eds) Encyclopedia of Evolutionary Psychological Science. Springer, Cham. https://doi.org/10.1007/978-3-319-16999-6

Ramos, D., Victor, T., Seidl-de-Moura, M. L., & Daly, M. (2013). Future Discounting by Slum-Dwelling Youth Versus University Students in Rio de Janeiro. *Journal of Research on Adolescence, 23*(1), 95–102. https://doi.org/10.1111/j.1532-7795.2012.00796.x

Ramos, D., Daly, M., Seidl-de-Moura, M. L., & Nadanovsky, P. (2017). The role of city income inequality, sex ratio and youth mortality rates in the effect of violent victimization on health-risk behaviors in Brazilian adolescents. *Social Science & Medicine, 181*, 17–23. https://doi.org/10.1016/j.socscimed.2017.03.057

Ramos, M. M., Cerqueira-Santos, E., & Machado, R. D. O. (2022). Saúde mental na segunda onda da pandemia de Coronavirus Disease 2019 no Brasil. *Journal of Nursing and Health, 12*(1), e2212121925. https://periodicos.ufpel.edu.br/ojs2/index.php/enfermagem/article/view/21925

Richardson, G. B., Dariotis, J. K., & Lai, M. H. C. (2017). From Environment to Mating Competition and Super-K in a Predominantly Urban Sample of Young Adults. *Evolutionary Psychology, 15*(1), 147470491667016. https://doi.org/10.1177/1474704916670165

Rood, B. A., Kochaver, J. J., McConnell, E. A., Ott, M. Q., & Pantalone, D. W. (2018). Minority stressors associated with sexual risk behaviors and HIV testing in a US sample of transgender individuals. *AIDS and Behavior, 22*(9), 3111–3116.

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

Schmitt, D. (2006). Sexual Strategies Across Sexual Orientations: How Personality Traits and Culture Relate to Sociosexuality Among Gays, Lesbians, Bisexuals, and Heterosexuals. *Journal of Psychology & Human Sexuality, 18*, 183–214. https://doi.org/10.1300/J056v18n02_06

Sear, R. (2020). Do human 'life history strategies' exist? *Evolution and Human Behavior, 41*(6), 513–526. https://doi.org/10.1016/j.evolhumbehav.2020.09.004

Sevi, B. (2019). Brief Report: Tinder Users Are Risk Takers and Have Low Sexual Disgust Sensitivity. *Evolutionary Psychological Science, 5*(1), 104–108. https://doi.org/10.1007/s40806-018-0170-8

Sevi, B., Aral, T., & Eskenazi, T. (2018). Exploring the hook-up app: Low sexual disgust and high sociosexuality predict motivation to use Tinder for casual sex. *Personality and Individual Differences, 133*, 17–20. https://doi.org/10.1016/j.paid.2017.04.053

Shiramizu, V. K. M. (2016). Sistema de resposta ao estresse, apego e sociossexualidade: Uma análise psicofisiológica das estratégias de história de vida. Tese de Doutorado, Centro de Biociências, Programa de Pós Graduação em Psicobiologia, Universidade de Natal, Rio Grande do Norte.

Silva Júnior, M. D., Silva, A., Rodrigues, M. L., Natividade, J., & Goulart, P. (2022). Evidence of the Male Sexual Function Index (MSFI) for the Brazilian context. *Avaliação Psicológica* (in press).

Simpson, J. A., Griskevicius, V., Kuo, S.I.-C., Sung, S., & Collins, W. A. (2012). Evolution, stress, and sensitive periods: The influence of unpredictability in early versus late childhood on sex and risky behavior. *Developmental Psychology, 48*(3), 674–686. https://doi.org/10.1037/a0027293

Stearns, S. C., & Rodrigues, A. M. M. (2020). On the use of "life history theory" in evolutionary psychology. *Evolution and Human Behavior, 41*(6), 474–485. https://doi.org/10.1016/j.evolhumbehav.2020.02.001

Todd, P. M., & Gigerenzer, G. (2000). Précis of Simple heuristics that make us smart. *Behavioral and Brain Sciences, 23*(5), 727–741. https://doi.org/10.1017/S0140525X00003447

Tooby, J., & Cosmides, L. (2008). The Evolutionary Psychology of the Emotions and Their Relationship to Internal Regulatory Variables. In The Handbook of Emotions (3o ed, p. 114–137). M. Lewis, J. M. Haviland-Jones & L. F. Barrett.

Waldis, L., Borter, N., & Rammsayer, T.H. (2021). The interactions among sexual orientation, masculine and feminine gender role orientation, and facets of sociosexuality in young heterosexual and homosexual men. *Journal of homosexuality*, *2003-2023*. https://doi.org/10.1080/00918369.2020.1717837

Waldron, M., Doran, K. A., Bucholz, K. K., Duncan, A. E., Lynskey, M. T., Madden, P. A. F., Sartor, C. E., & Heath, A. C. (2015). Parental Separation, Parental Alcoholism, and Timing of First Sexual Intercourse. *Journal of Adolescent Health, 56*(5), 550–556. https://doi.org/10.1016/j.jadohealth.2015.01.011

Wang, I. M., Michalak, N. M., & Ackerman J. M. (2021). Life history strategies. In: V. Weekes-Shackelford, T. Shackelford, & V. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science*. Springer. https://doi.org/10.1007/978-3-319-19650-3_1926

Weiser, D. A., Niehuis, S., Flora, J., Punyanunt-Carter, N. M., Arias, V. S., & Hannah Baird, R. (2018). Swiping right: Sociosexuality, intentions to engage in infidelity, and infidelity experiences on Tinder. *Personality and Individual Differences, 133*, 29–33. https://doi.org/10.1016/j.paid.2017.10.025

Wenner, C. J., Bianchi, J., Figueredo, A. J., Rushton, J. P., & Jacobs, W. J. (2013). Life history theory and social deviance: The mediating role of executive function. *Intelligence, 41*(2), 102–113.

Wilson, M., & Daly, M. (2004). Do pretty women inspire men to discount the future? *Proceedings of the Royal Society b: Biological Sciences, 271*(Suppl 4), S177–S179.

Zheng, L., Hart, T. A., & Zheng, Y. (2013). Attraction to male facial masculinity in gay men in China: Relationship to intercourse preference positions and sociosexual behavior. *Archives of Sexual Behavior, 42*(7), 1223–1232. https://doi.org/10.1007/s10508-012-0057-x

Authors and Affiliations

Mauro Dias Silva Júnior[1] · Mozer de Miranda Ramos[2] · Hellen Vivianni Veloso Corrêa[3]

Mozer de Miranda Ramos
mozeramos@gmail.com

Hellen Vivianni Veloso Corrêa
viviannіveloso@yahoo.com.br

[1] Postgraduate Program in Behavioral Sciences, University of Brasilia, Brasília, Federal District 70.910-900, Brazil

[2] Postgraduate Program in Psychology, Federal University of Sergipe, São Cristóvão, Brazil

[3] Postgraduate Program in Neurosciences and Behavior, Federal University of Pará, Belém, Pará, Brazil