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Perceived Flirting Skills Mediate the Relationship Between Sociosexuality and Singlehood Status Among Young Adults in Colombia

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Data availability

The datasets analyzed during the current study are available at [available after review].

Authors contributions

JM: Conceptualization, Formal analysis, Writing – Original draft, Writing – Reviewing and editing; **DR:** Methodology, Data curation, Formal analysis; Writing – Original draft, Writing – Reviewing and editing; **MRM:** Conceptualization, Methodology, Investigation, Writing –

Reviewing and editing; **DLR:** Conceptualization, Methodology, Investigation, Writing – Reviewing and editing; **MM:** Investigation, Writing – Reviewing and editing.

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Abstract

Past research has linked sociosexuality and flirting skills to different types of singlehood. Individuals with unrestricted sociosexuality are less likely to enter long-term relationships or experience involuntary singlehood, whereas shyness and low self-confidence are common reasons for involuntary singlehood. However, existing studies tend to focus solely on direct associations between sociosexuality, courtship behaviors, and singlehood status, overlooking potential interaction effects among these factors. In this cross-sectional study of 816 Colombian young adults (487 women and 329 men), we examined whether flirting self-efficacy beliefs mediate the relationship between sociosexuality and singlehood status. Multinomial logistic regression models indicated that higher levels of unrestricted sociosexuality and greater perceived flirting self-efficacy were associated with a decreased likelihood of reporting singlehood due to difficulty finding a partner. Moreover, structural equation models demonstrated that flirting self-efficacy mediates the relationship between sociosexuality and singlehood status. These findings underscore the importance of flirting self-efficacy in the mating process and illuminate pathways through which sociosexuality influences singlehood status in the Latin American context.

Keywords: Singlehood; Sociosexuality; Flirting Self-efficacy; Multinomial Logistic Regression; Structural Equation Modeling.

Introduction

Over the past fifty years, singlehood has become increasingly prevalent worldwide (Apostolou & Patsiarika, 2022; Esteve et al., 2020; Fitzpatrick, 2023; Girme et al., 2022; Oh et al., 2021). Despite its growing commonality (Apostolou et al., 2018, 2021, 2023; OECD, 2021; U.S. Census Bureau, 2020), the diversity of singlehood status and their association with mating challenges remain poorly understood (Apostolou et al., 2023; Pepping et al., 2024). While extensive research has been conducted in North America and Europe, the study of singlehood in Colombia remains underdeveloped. Despite increasing rates of singlehood in Colombia, research on the psychological factors influencing single status—particularly in relation to sociosexuality and flirting self-efficacy—is still in its early stages (Coral & García, 2020; ECLAC, 2022). The theoretical frameworks and instruments commonly used to study singlehood require further validation within the Colombian context. This gap in the literature hinders understanding of singlehood in Colombian society and limits the applicability of findings from other cultural settings, emphasizing the necessity for tailored validation and exploration of these concepts in Colombia.

Motives for adult singlehood have been extensively explored in past studies (Fitzpatrick, 2023; Mortelmans et al., 2023; Park et al., 2023; Stein, 1978). Some individuals choose singlehood to pursue personal growth (e.g., education or career advancement) or prefer casual partnerships (Apostolou, 2019; Apostolou & Philippou, 2022; Mrozowicz-Wrońska et al., 2023; Tan et al., 2021). Conversely, others face challenges in attracting partners or are constrained by health issues (Apostolou, 2017; Mrozowicz-Wrońska et al., 2023; Oh et al., 2021). Broader social and demographic phenomena, such as shifts in gender roles, immigration patterns, and levels of religiosity, also play significant roles in shaping individuals' singlehood status (Adamczyk, 2021, 2023; Hostetler, 2009; Mrozowicz-Wrońska et al., 2023).

Despite the different motives for being single, the field of relationship studies has primarily focused on differences between partnered and single individuals, overlooking variations within the single population (Fitzpatrick, 2023; Girme et al., 2022; Oh et al., 2021; Pepping et al., 2024; Stein, 1978; Tao, 2019; Tessler, 2023). Partnered individuals generally report better health and happiness than their single counterparts (Adamczyk, 2017; Lawrence et al., 2019; Oh et al., 2021; Tan et al., 2021). In contrast, involuntarily single individuals tend to report lower life satisfaction and

subjective well-being than those who are voluntarily single or in relationships (Apostolou, Matogian, et al., 2019; Apostolou, Papadopoulou, et al., 2019; Coral & García, 2020; Oh et al., 2021). These distinctions may arise because voluntarily single individuals interpret their status as a result of personal choice and autonomy, whereas involuntarily singles perceive their situation as influenced by external factors beyond their control (Fitzpatrick, 2023; Girme et al., 2022; Tan et al., 2021).

Sociosexuality and Flirting Self-efficacy in the Context of Singlehood

Sociosexuality, defined as the willingness for sexual activity without emotional attachment (Simpson & Gangestad, 1991), plays a crucial role in understanding singlehood dynamics. Individuals with unrestricted sociosexuality are more inclined toward short-term mating strategies, report higher numbers of sexual partners, and prioritize certain attributes in potential partners compared to their sociosexually restricted counterparts (Apostolou & Patsiarika, 2022; Davis et al., 2022; Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017). Consequently, those with unrestricted sociosexuality are more likely to choose voluntary singlehood over committed relationships (Apostolou & Patsiarika, 2022).

On the other hand, individuals who struggle to attract partners despite desiring romantic involvement often attribute their single status to low self-confidence and shyness (Adamczyk, 2021, 2023; Ang et al., 2020; Apostolou, 2021a; Apostolou et al., 2018; Mrozowicz-Wrońska et al., 2023). This is specifically due to low self-efficacy in flirting, which refers to a person's belief in their ability to engage in effective behaviors in flirting situations (see discussion about the definition at Wade, 2018). This notion is grounded in Albert Bandura's theory of self-efficacy, which posits that an individual's perception of their ability to perform specific tasks influences their behavior and motivation to face new situations. In this context, self-efficacy manifests as the confidence one must initiate romantic interactions, maintain flirty conversations, read social cues, and respond appropriately to others' signals of interest. Individuals with poor flirting self-efficacy may avoid interacting with others or actively push them away, thus preventing potential romantic or sexual opportunities (Apostolou, 2019). This indicates that singlehood (at least involuntary singlehood) is strongly associated with individuals' low flirting self-efficacy (Apostolou, 2019; Apostolou et al., 2021; Apostolou & Wang, 2019) in both online and face-to-face contexts (Romero et al., 2023).

Additionally, sociosexually unrestricted individuals demonstrate more courtship behaviors, such as smiling and flirting both in face-to-face contexts as well as on social media, and are attracted to others who exhibit similar behaviors (Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017; Romero et al., 2023). Given these findings, sociosexuality and flirting self-efficacy significantly influence singlehood status by facilitating the initiation and maintenance of both short-term and long-term relationships (Apostolou et al., 2023; Apostolou & Christoforou, 2022; Penke & Asendorpf, 2008). So far, studies conducted with European and Asian samples have examined how sociosexuality and flirtation success are directly related to involuntary singlehood (Adamczyk, 2017; Apostolou et al., 2018, 2023; Apostolou & Tsangari, 2022; Apostolou & Wang, 2019; Kislev, 2021a, 2022; Tan et al., 2021). However, the psychological mechanisms by which sociosexuality may influence involuntary singleness have not been sufficiently studied.

The present article argues that flirting self-efficacy may mitigate involuntary singlehood among sociosexually unrestricted individuals, as those pursuing a short-term mating strategy tend to have stronger flirting skills, facilitating partner transitions. Furthermore, it establishes that cultural context significantly influences singlehood and sociosexuality (Apostolou et al., 2021; Schmitt & Jonason, 2019), highlighting the need for further exploration of these relationships in underrepresented regions such as Latin America.

The Present Study

The present study aimed to examine whether the expected association between sociosexuality and voluntary singlehood was mediated by flirting self-efficacy beliefs in a cohort of young adults from Colombia. To achieve this, multinomial logistic regression models were used to assess the direct relationships among the variables. Building on previous research indicating that individuals with unrestricted sociosexuality tend to exhibit more courtship-related behaviors and higher self-esteem (Apostolou & Philippou, 2022; Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017), we hypothesized that there would be a positive relationship between sociosexuality and flirting self-efficacy (H1).

Furthermore, past studies have shown that individuals with unrestricted sociosexuality are less likely to be in long-term relationships or involuntarily single (Apostolou & Patsiarika, 2022; Davis et al., 2022; Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017). In contrast, shyness and low self-confidence have been identified as factors contributing to involuntary singlehood (Ang et

al., 2020; Apostolou, 2021a; Apostolou et al., 2018; Fitzpatrick, 2023). Thus, we expected that both unrestricted sociosexuality (H2) and high perceived ability to flirt (H3) would be associated with a higher probability of participants reporting singlehood due to preference rather than difficulty in finding a partner or being in a long-term relationship. Additionally, we explored whether flirting self-efficacy beliefs mediated the relationship between sociosexuality and singlehood status using structural equation modeling (SEM). Specifically, we hypothesized that flirting self-efficacy would partially mediate the link between sociosexuality and singlehood status (H4).

Methods

Participants

A total of 1,005 individuals accessed the online survey; of these, 20 did not complete it, and 169 were removed for incorrectly answering the control item. The final sample included 816 participants, with 487 females (59.68%) and 329 males (40.32%). Ages ranged from 18 to 56 years ($M = 23.04$, $SD = 6.80$). Of the total sample, 83.95% of the participants identified as heterosexual, 11.27% as bisexual, and 4.78% as gay or lesbian. Regarding educational level, 29.66% of the participants completed high school or middle school, 14.71% had a technical educational level, 49.02% were pursuing an undergraduate degree, and 6.62% had a graduate degree. Additionally, 54.66% of the sample reported being in a relationship, 13.85% were single because they recently ended a relationship, 23.53% chose to be single, and 7.96% were single because they were unable to get a partner. Full demographic details of the sample are provided in Table 1 (group-specific demographics are available in supplementary material S.1).

2.2 Instruments

2.2.1 Demographic Questionnaire. Participants were asked to indicate their age in years (open-ended question), biological sex (male, female, prefer not to answer), sexual orientation (heterosexual, gay/lesbian, bisexual, prefer not to answer), and completed level of education (high school, technical/technological, undergraduate, graduate). Singlehood status was assessed using an item from Apostolou and colleagues (Apostolou, 2021a; Apostolou & Philippou, 2022; Apostolou, Matogian, et al., 2019). Specifically, we asked participants to indicate which statement most accurately represented their status: ‘"*in a romantic relationship*", "*just got out of a*

relationship", "*single because I prefer to be this way*", or "*single because it is difficult to find a partner*".

2.2.2 Sociosexuality. The Sociosexual Orientation Inventory-Revised (SOI-R) is a nine-item questionnaire proposed by Penke and Asendorpf (2008) and validated with a Colombian sample by Romero et al. (2022). This instrument assesses individuals' predisposition toward casual sex, considering their behaviors (three items; ω = .90; e.g., "*How many partners have you had penetrative sex with in your lifetime?*"), attitudes (three items; ω = .85; e.g., "*Sex without love is okay*"), and motivations (three items; ω = .87; e.g., "*How often do you feel sexually aroused without love?*"). Responses were given on a 5-point scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Higher scores indicate a greater predisposition toward casual sex.

2.2.3 Flirting Self-Efficacy. The Flirting Self-Efficacy Inventory (FSI) is a 14-item questionnaire developed by Romero et al. (2024) to measure self-efficacy skills in flirting. This questionnaire is composed of two subscales: the virtual component (eight items; ω = .93; e.g., "*I find it comfortable to flirt with someone through social networks*") and the face-to-face component (six items; ω = .91; e.g., "*It is easy for me to get a date with someone I just met*"). Responses were given on a 5-point scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Higher scores indicate greater perceived efficacy in flirting.

2.3. Procedure

This study was approved by the Ethics Committee of [blind for review] (No. 185/2019). Participants were recruited using a non-probabilistic snowball sampling method. Psychology students were first surveyed using the QuestionPro platform (www.questionpro.com) between April 2019 and May 2020. As inclusion criteria, it was stipulated that participants must be at least 18 years old, sexually active, and living in Colombia at the time of the survey to ensure greater accuracy in the measurement of aspects such as sociosexual behavior. The web survey's first page included informed consent and contact information for psychological care centers in case participants experienced adverse emotional reactions. To ensure data quality, a five-point Likert-type attention check was included midway through the survey ("To verify that you are reading each question, please answer the option *Not at all satisfied*"). Participants who failed this control item were excluded. The survey also included other measures that were not relevant to this study.

2.4. Analytic Strategy

Data treatment. There were no missing responses in the retained dataset. The normality of the data was assessed using the MVN (Korkmaz et al., 2014) package in R (R Core Team, 2022) and indicated that they were neither univariate (Lilliefors-corrected Kolmogorov-Smirnov tests, $p < .001$) nor multivariate normal (Mardia's skewness = 1342.123, $p < .001$, Mardia's kurtosis = -28.412, $p < .001$).

Exploratory analysis. Descriptive statistics were computed for the sociodemographic variables, sociosexuality, and flirting self-efficacy. The levels of sociosexuality and flirting self-efficacy were compared by singlehood status ("*in a romantic relationship*", "*just got out of a relationship*", "*single because I prefer to be this way*", and "*single because it is difficult to find a partner*"). Initially, normality and equality of variances between groups were evaluated using the Lilliefors-corrected Kolmogorov-Smirnov and Levene tests. Since the groups did not approximate a normal distribution but showed homoscedasticity, Kruskal-Wallis tests were used. Post hoc comparisons were conducted using Mann-Whitney tests with a Bonferroni-adjusted alpha level.

Linear regression model. The correlation between sociosexuality and flirting self-efficacy was assessed using Spearman's rank correlation coefficient due to non-normal data. Subsequently, a simple regression model was estimated using sociosexuality as the independent variable and flirting self-efficacy as the dependent variable. Residual normality was evaluated with the Lilliefors-corrected Kolmogorov-Smirnov test, and residual homoscedasticity was assessed using the studentized Breusch-Pagan test. Because the residuals of the regression model approximated a normal distribution ($D = .022$, $p = .423$) and were homoscedastic ($\chi2(1) = .100$, $p = .751$), the unweighted least squares (ULS) estimation method was used.

Multinomial Logistic regression model. A multinomial logistic regression model was estimated using the nnet (Venables & Ripley, 2002) and VGAM (Yee, 2015) packages in R. The initial regression model included age, sex, sexual orientation, sociosexuality, and flirting self-efficacy as independent variables, while singlehood status was the dependent variable. Participants who reported being "*single because it is difficult to find a partner*" were used as the reference category (see supplementary materials, Table S.2). To ensure model parsimony, the number of regressors was reduced using the step function available in R with mixed direction. The final model only included age, sociosexuality, and flirting self-efficacy as regressors. A residual deviance test

indicated that the reduced model did not differ significantly from the full model, $\chi2(12) = 11.69$, $p = .471$. The goodness of fit of the multinomial logistic regression model was evaluated using the Hosmer-Lemeshow omnibus test computed with the generalhoslem package (Matthew, 2019).

Mediation analysis. Three structural equation models were estimated using the lavaan package (Rosseel, 2012) to examine the mediation effect of flirting self-efficacy in the relationship between sociosexuality and singlehood status. Given the ordinal nature of the response variables, weighted least squares with robust standard errors and a mean and variance-adjusted test statistic (WLSMV) was employed within a structural equation modeling framework. The models' goodness-of-fit was examined using $\chi2$ statistics, the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). The cutoff values indicating good fit were a significant $\chi2$ ($p > .05$), an RMSEA between .05 and .08, and an SRMR less than .08 (Hu & Bentler, 1999; Schumaker & Lomax, 2016; Shi & Maydeu-Olivares, 2020).

Results

Comparisons across groups

When comparing sociosexuality across partnered and single participants, the Kruskal-Wallis test indicated moderate differences between rank totals, $H(3, 816) = 91.344$, $p < .001$, $\eta^2 = .109$. Post hoc Mann-Whitney tests revealed that participants who reported being "*in a romantic relationship*" were significantly less sociosexually unrestricted compared to those who reported being "*single because I just got out of a relationship*" ($W = 17{,}296$, $p < .001$, $r = .218$), "*single because I prefer to be this way*" ($W = 26{,}355$, $p < .001$, $r = .305$), and "*single because it is difficult to find a partner*" ($W = 7{,}487$, $p < .001$, $r = .279$). None of the other comparisons were significant after the Bonferroni correction ($p \geq .071$).

Flirting self-efficacy was also compared across groups. The Kruskal-Wallis test indicated small differences between rank totals, $H(3, 816) = 22.323$, $p < .001$, $\eta^2 = .024$. Post hoc Mann-Whitney tests showed that participants who reported being "*single because I prefer to be this way*" had a greater perceived ability to flirt compared to those in the "*in a romantic relationship*" category ($W = 52{,}081$, $p < .001$, $r = .172$) and those who reported being "*single because it is difficult to find a partner*" ($W = 7{,}792$, $p = .008$, $r = .187$). None of the other comparisons were significant after the Bonferroni adjustment ($p \geq .068$).

Linear regression model

The relationship between sociosexuality and flirting self-efficacy was assessed. Spearman's correlation indicated a moderately significant relationship between these two variables, $r(812) = .472$, $p < .001$. Due to the correlation's magnitude, a simple linear regression model was estimated. The model explained a significant amount of flirting self-efficacy variance, $F(1, 814) = 246.2$, $p < .001$, $R^2 = .231$. The regression coefficient indicated that an increase of one point in sociosexuality score corresponded, on average, to an increase in flirting self-efficacy score by .425 points, $B = .482$, 95% CI [.422, .542], $t(814) = 15.69$, $p < .001$, $f^2 = .30$.

Multinomial logistic regression

The results of the multinomial logistic regression model (see Table 2) indicate that sociosexuality is significantly associated with singlehood status. Higher unrestricted sociosexuality scores increase the likelihood of reporting being "*single because it is difficult to find a partner*" and decrease the likelihood of reporting being "*in a romantic relationship*" ($B = -.055$, $p < .001$), "*single because I just got out of a relationship*" ($B = -.027$, $p = .001$), or "*single because I prefer to be this way*" ($B = -.021$, $p = .005$).

Flirting self-efficacy was also a significant predictor, associated with a decreased likelihood of reporting difficulty finding a partner and an increased likelihood of being "*in a romantic relationship*" ($B = .034$, $p < .001$), "*single because I just got out of a relationship*" ($B = .027$, $p = .002$), or "*single because I prefer to be this way*" ($B = .030$, $p < .001$). Age was also associated with singlehood status, with older participants being less likely to report being "*single because it is difficult to find a partner*" than reporting being "*in a romantic relationship*" ($B = .187$, $p < .001$). The Hosmer-Lemeshow test indicated good model fit, $H(24) = 30.51$, $p = .168$.

Mediation models

The fit indices for the three mediation models were satisfactory (see Table 3). As shown in Table 4, the results of the SEMs indicated that sociosexuality had a positive association with flirting self-efficacy in all three models. The models also showed that sociosexuality was significantly related to singlehood status (all $p < .05$), where participants with more unrestricted sociosexuality were more likely to report being "single because it is difficult to find a partner." In contrast, flirting self-efficacy was associated with higher chances of reporting being "in a romantic

relationship" (B = .026, $p < .001$), "single because I just got out of a relationship" (B = .033, $p = .004$), or "single because I prefer to be this way" (B = .022, $p = .001$; see Figures 1-3). Moreover, the mediation pathway between sociosexuality, flirting self-efficacy beliefs, and singlehood status was statistically significant in all three models (all $p < .03$).

Discussion

In the present study, we explored whether the relationship between sociosexuality and singlehood status is mediated by participants' perceived flirting abilities in a sample of Colombian young adults. Our findings support the direct relationship between sociosexuality and flirting self-efficacy, aligning with previous research on courtship behaviors (Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017). Interestingly, our results also show that higher levels of sociosexuality are associated with a greater likelihood of participants reporting being "single because it is difficult to find a partner," which contrasts with earlier studies suggesting that individuals with unrestricted sociosexuality are less likely to be involuntarily single (Apostolou & Philippou, 2022). Moreover, all SEM models revealed a significant mediating pathway between sociosexuality, flirting self-efficacy, and singlehood status, highlighting the crucial role of flirting skills in both short-term and long-term matchmaking contexts (Clark et al., 2021; Kennair et al., 2022; Speer, 2017). Overall, these findings highlight the association between sociosexuality, flirting self-efficacy, and singlehood status.

Consistent with the first hypothesis (H1), the results of the linear regression model indicated that sociosexuality is directly related to flirting self-efficacy. These findings are in line with previous research, which has shown a direct relationship between sociosexuality and courtship behaviors (Penke & Asendorpf, 2008; Rodrigues & Lopes, 2017). In this case, we departed from Bandura's (1997) hypothesis by using flirting self-efficacy beliefs as an indirect measure of courtship behavior. This might imply that people with unrestricted sociosexuality tend, on average, to feel confident in their flirting abilities and motivated to approach potential partners. It is also likely that the effect of sociosexuality is, at least in part, associated with people's flirting skills.

On the other hand, the results of the multinomial logistic regression model did not support our second hypothesis (H2). Although we expected that participants with unrestricted sociosexuality would be more likely to report being "*single because I prefer to be this way,*" results

indicated that a higher level of sociosexuality is related to a higher probability of participants being "*single because it is difficult to find a partner.*" These results contrast with past research, which has described how people with unrestricted sociosexuality are less likely to be involuntarily single (Apostolou & Philippou, 2022). This difference may be due to the cultural context (Apostolou et al., 2021; Baumeister & Mendoza, 2011; Kennair et al., 2022; Penke & Asendorpf, 2008; Schmitt, 2005). In the Latin American mating market, individuals with unrestricted sociosexuality may face difficulties finding a partner who is open to casual relationships, or agrees to non-consensual monogamous relationships, unless manipulation or persuasion is employed (Burtăverde & Ene, 2021; Jauk et al., 2016; Jonason et al., 2010; Jones & Olderbak, 2014). In contrast, in Europe and Asia, there is a greater chance of finding a compatible partner who agrees to stay in a consensual non-monogamous relationship (de Rivas et al., 2022; Jones & Olderbak, 2014; Thompson et al., 2020; Træen & Thuen, 2022).

In line with our third hypothesis (H3), the multinomial logistic regression model shows that participants who report higher flirting self-efficacy are less likely to report being "single because it is difficult to find a partner." These results are in line with studies by Ang et al. (2020) and Apostolou (2019, 2021b; Apostolou, Papadopoulou, et al., 2019), in which low self-confidence and shyness in flirting were determinants for finding a partner. People with low levels of flirting self-efficacy may become less motivated to seek partners or flirt, as they consider that they are unlikely to succeed (Apostolou & Philippou, 2022). Likewise, these results are consistent with past studies (Adamczyk, 2021, 2023; Apostolou, 2017, 2021a; Donnelly et al., 2001; Mrozowicz-Wrońska et al., 2023), in which a large proportion of involuntary singles have been found to report poor flirting skills, failure to perceive signs of interest, and making little effort to find a partner.

Finally, the mediating pathway between sociosexuality, flirting self-efficacy, and singlehood status was statistically significant in all SEM models, supporting our fourth hypothesis (H4). These results are consistent with previous studies that underscore the importance of flirting in both short- and long-term matchmaking contexts (Clark et al., 2021; Kennair et al., 2022; Speer, 2017). More research is needed to determine how this model holds across different mating markets and to identify other individual characteristics that explain the remaining variability associated with singlehood status.

Strengths, Limitations, and Future Directions

A key strength of this study is its novel exploration of the interplay between sociosexuality, flirting self-efficacy, and singlehood status, which has not been jointly examined before, especially within the Latin American context. By focusing on a sample of young, single adults, this research provides valuable insights into both their courtship dynamics and sexual behavior, offering a unique understanding of how these factors interrelate and influence singlehood.

This study has several important limitations. First, the cross-sectional design restricts causal inference, as causality cannot be established from these data. Although Structural Equation Modeling (SEM) was employed to examine directional associations based on theoretically informed pathways (Bollen & Pearl, 2013; Zyphur et al., 2023), these associations should be interpreted as associative rather than causal due to the potential influence of unobserved confounding factors or bidirectional effects (Bollen & Pearl, 2013). Additionally, the use of a non-probabilistic snowball sampling method, while yielding an adequate sample size, limits the generalizability of the findings due to potential selection biases that reduce applicability to broader populations (Sedgwick, 2013; Stratton, 2021; Zickar & Keith, 2023). Future studies employing longitudinal or experimental designs, along with probabilistic sampling methods, are recommended to enhance causal inference and generalizability (Rohrer & Murayama, 2023). Similarly, one notable limitation of the study is that approximately 15% of survey responses did not pass the attention check-item. While this percentage indicates that most responses were valid, it highlights the need for caution when interpreting the findings, as this could affect the generalizability of the results. Future research could benefit from employing additional measures to ensure response quality and enhance the robustness of the data.

Moreover, this research does not account for the effect of sexual orientation on the evaluated model and treats singlehood solely as a union status (Hostetler, 2009; Kislev & Marsh, 2023). To enhance understanding of the complex and multidimensional nature of singlehood, future studies should consider additional constructs, including social identity, relationship satisfaction, and attitudes toward singlehood (Beckmeyer & Jamison, 2023; Hostetler, 2009; Tessler, 2023). Although sexual orientation and other demographic variables were initially included in the model, they were subsequently excluded due to a lack of significant association with singlehood status (see supplementary material, S.2-4). This could be attributed to the low

proportion of non-heterosexual participants in the sample, limiting statistical power to detect such effects (Goeman & Le Cessie, 2006). Additionally, sexual orientation, along with the dynamics of gay and lesbian communities, may shape the experience of singlehood and sexuality by influencing how individuals navigate relationships and sexual norms within their social environments (Suen, 2015; Træen & Kvalem, 2022; Træen & Thuen, 2022). The availability of potential partners within these communities can significantly affect the formation of romantic and sexual connections, thereby reshaping the experience of being single. Future research should include more diverse samples and comprehensive demographic measures to better understand these dynamics.

Future research should also explore the effects of culture on sociosexuality, singlehood, and courtship behaviors by recruiting cross-cultural samples. The influence of cultural norms pertaining to relationships and sexual behaviors could shape the links between sociosexuality, flirting self-efficacy, and singlehood (Apostolou et al., 2023; Clark et al., 2021; Schmitt, 2005). Further research replicating and extending these findings within diverse cultural contexts, while also considering the roles of biological sex, gender, and sexual orientation, is essential for a more comprehensive understanding. This study represents an important step in the study of singlehood by revealing that sociosexuality is directly related to flirting self-efficacy, with the latter mediating the relationship between sociosexuality and singlehood status.

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Table 1. General Descriptive Statistics of the Sample (n = 816)

Item	
Age	M = 23.6 (SD = 7.35)
Sex	
Male	n = 329 (40.3%)
Female	n = 487 (59.7%)
Sexual orientation	
Heterosexual	n = 685 (84.0%)
Gay/Lesbian	n = 39 (4.8%)
Bisexual	n = 9 (11.3%)
Educational Level	
High/middle school	n = 242 (29.7%)
Technical	n = 120 (14.7%)
Undergraduate degree	n = 400 (49.0%)
Graduate degree	n = 54 (6.6%)

Note. Age is reported as mean and standard deviation (SD) in years. Sex, sexual orientation, and educational level are reported as absolute frequencies (n) and relative percentages (%).

Table 2. Multinomial Logistic Regression.

Predictor	'In a romantic relationship'				'I just got out of a relationship'				'I prefer to be this way'			
			OR 95% CI				OR 95% CI				OR 95% CI	
	B	SE	Lower	Upper	B	SE	Lower	Upper	B	SE	Lower	Upper
(Intercept)	-1.295	1.128	.030	2.499	.134	1.302	.089	14.671	-1.013	1.172	.037	3.611
Age	.187***	.054	1.086	1.340	.024	.062	.907	1.158	.084	.056	.976	1.213
Sociosexuality	-.055***	.007	.932	.960	-.027**	.008	.958	.990	-.021**	.008	.965	.994
Flirting Self-Efficacy	.034***	.008	1.019	1.051	.027**	.009	1.010	1.046	.030**	.008	1.014	1.047

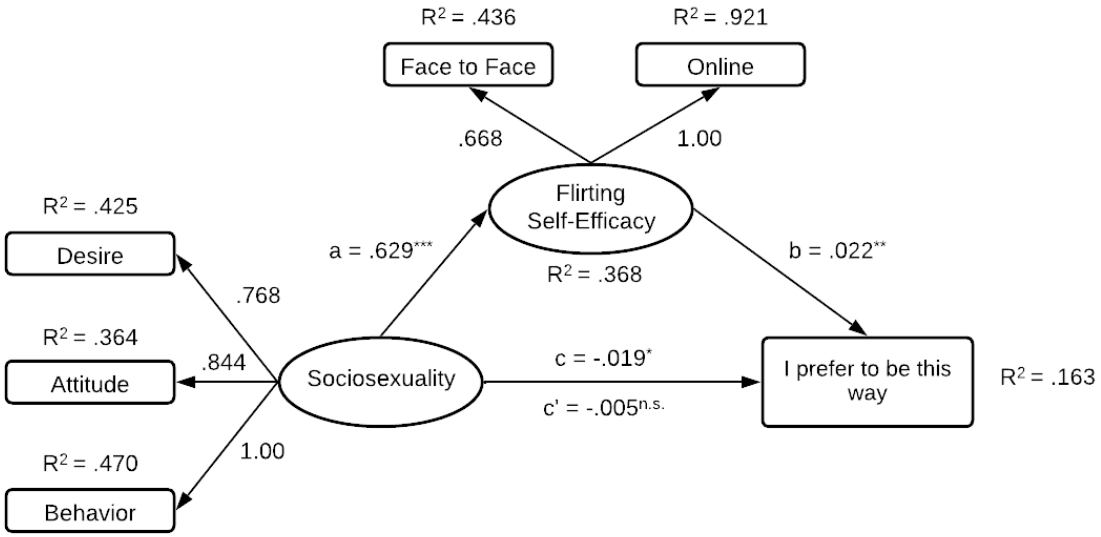
Note. B = Regression coefficients; SE = Standard Error; OR = Odds Ratio; CI = Confidence Interval. Participants reporting being 'single because it is difficult to find a partner' were used as reference category. 'I prefer to be this way' refers to participants who declare being 'Single because I prefer to be this way'. $^{*}p < .05.$; $^{**}p < .01$; $^{***}p < .001$

Table 3. Fit Statistics of the Structural Equation Models

Model	χ^2	df	*p*	RMSEA	SRMR
'It is difficult to find a partner' VS 'I prefer to be this way'	4.096	7	.769	<.001	.035
'It is difficult to find a partner' VS 'In a romantic relationship'	13.925	7	.053	.044	.047
'It is difficult to find a partner' VS 'I just got out of a relationship'	4.786	7	.686	<.001	.041

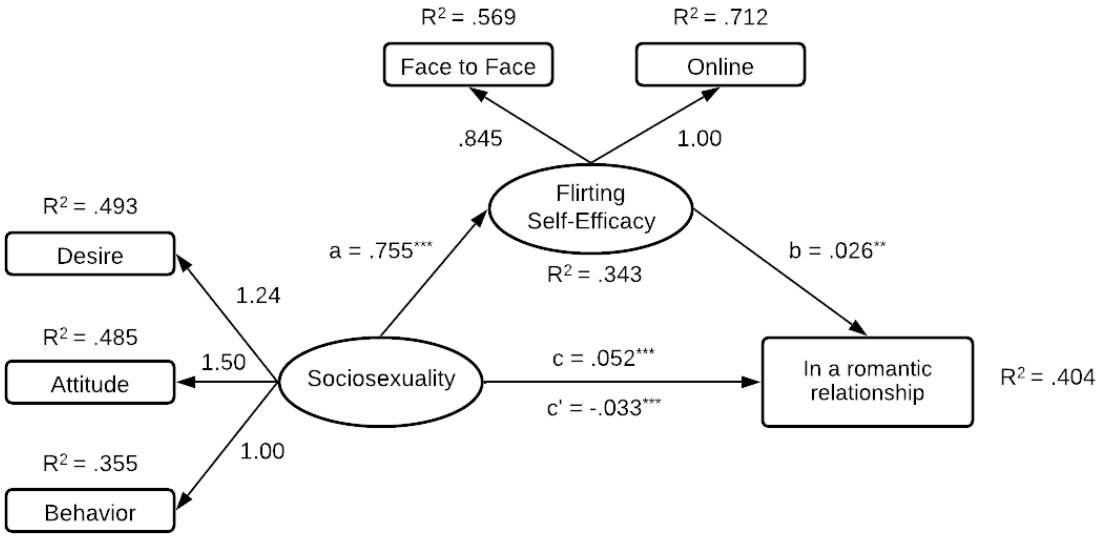
Note. df = degrees of freedom. *p* = p-value. RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual. 'I prefer to be this way' refers to participants who declare being 'Single because I prefer to be this way'. 'It is difficult to find a partner' refers to participants who declare being 'single because it is difficult to find a partner'.

Figure 1. Mediating effect of flirting self-efficacy on the relation between sociosexuality and singlehood status ('It is difficult to find a partner' VS 'I prefer to be this way').



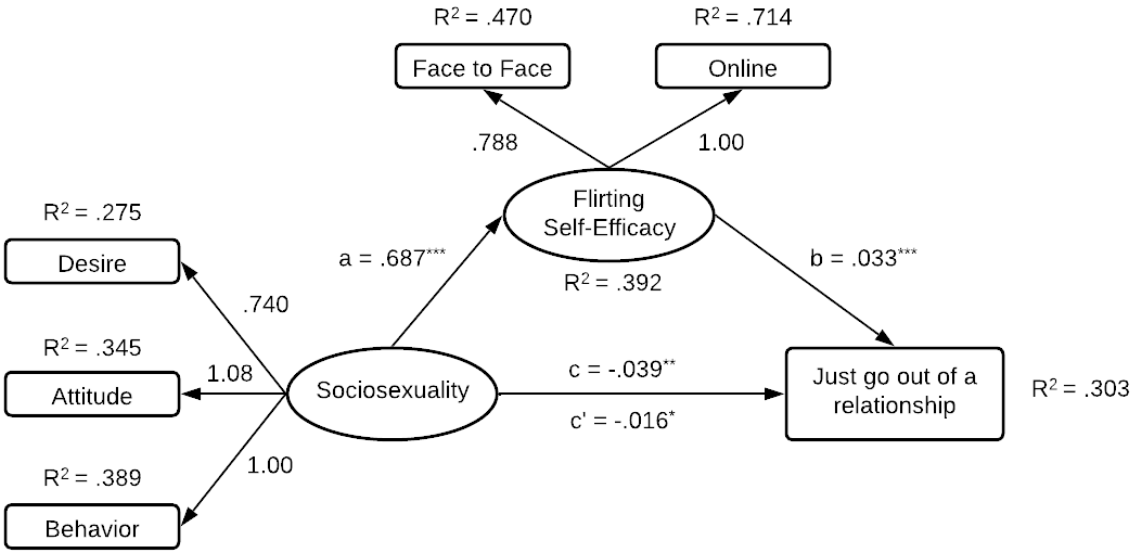
Note. a, b, c y c' are path coefficients representing regression weights. The path coefficient c represents the total effect of sociosexuality on involuntary singlehood after controlling for the mediation effect. The coefficient c' refers to the direct effect of sociosexuality on involuntary singlehood. 'I prefer to be this way' refers to participants who declare being 'Single because I prefer to be this way'. Participants who declare being 'single because it is difficult to find a partner' were use as reference category. $^{*}p < .05$.; $^{**}p < .01$; $^{***}p < .001$; n.s. = not statistically significant.

Figure 2. Mediating effect of flirting self-efficacy on the relation between sociosexuality and singlehood status (‘It is difficult to find a partner’ VS ‘in a romantic relationship’).



Note. a, b, c y c' are path coefficients representing regression weights. The path coefficient c represents the total effect of sociosexuality on singlehood status after controlling for the mediation effect. The coefficient c' refers to the direct effect of sociosexuality on singlehood status. Participants who declare being ‘single because it is difficult to find a partner’ were use as reference category. $^{*}p < .05.$; $^{**}p < .01$; $^{***}p < .001$.

Figure 3. Mediating effect of flirting self-efficacy on the relation between sociosexuality and singlehood status ('It is difficult to find a partner' VS 'I just got out of a relationship').



Note. a, b, c y c' are path coefficients representing regression weights. The path coefficient c represents the total effect of sociosexuality on singlehood status after controlling for the mediation effect. The coefficient c' refers to the direct effect of sociosexuality on singlehood status. Participants who declare being 'single because it is difficult to find a partner' were use as reference category. $^{*}p < .05.$; $^{**}p < .01$; $^{***}p < .001$.

Table 4. Summary of the Indirect and Direct Effects of Sociosexuality and Flirting Self-Efficacy on Singlehood Status.

Model/Effects	B (SE)	β	Z	*p*	95% CI	
					Lower	Upper
'It is difficult to find a partner' VS I prefer to be this way						
Sociosexuality X 'I prefer to be this way' category [a]	-.019 (.008)	-.400	-2.471	.013	-.033	-.004
Sociosexuality X Flirting Self-Efficacy	.629 (.101)	.607	6.199	<.001	.430	.827
Flirting Self-Efficacy X 'I prefer to be this way' category	.022 (.007)	.492	3.232	.001	.009	.035
Sociosexuality X Flirting Self-Efficacy X 'I prefer to be this way' category	.014 (.005)	.299	2.729	.006	.004	.024
Total effect of sociosexuality on 'I prefer to be this way' category	-.005 (.005)	-.102	-1.029	.304	-.014	.004
'It is difficult to find a partner' category VS 'In a romantic relationship'						
Sociosexuality X 'In a romantic relationship' category[a]	-.052 (.008)	-.783	-6.595	<.001	-.068	-.037
Sociosexuality X Flirting Self-Efficacy	.755 (.083)	.586	9.096	<.001	.592	.917
Flirting Self-Efficacy X 'In a romantic relationship' category	.026 (.006)	.497	4.316	<.001	.014	.037
Sociosexuality X Flirting Self-Efficacy X 'In a romantic relationship' category	.019 (.005)	.291	3.770	<.001	.009	.030
Total effect of sociosexuality on 'In a romantic relationship' category	-.033 (.005)	-.492	-6.478	<.001	-.043	-.023
'It is difficult to find a partner' VS 'Just go out of a relationship'						
Sociosexuality X 'Just go out of a relationship' category [a]	-.039 (.013)	-.661	-2.921	.003	-.065	-.013
Sociosexuality X Flirting Self-Efficacy	.687 (.153)	.626	4.486	<.001	.387	.987
Flirting Self-Efficacy X 'Just go out of a relationship' category	.033 (.011)	.609	2.854	.004	.010	.055
Sociosexuality X Flirting Self-Efficacy X 'Just go out of a relationship' category	.022 (.010)	.381	2.258	.024	.003	.042
Total effect of sociosexuality on 'Just go out of a relationship' category	-.016 (.007)	-.280	-2.438	.015	-.030	-.003

Note: B = Unstandardized Regression Coefficients; β = Standardized Regression Coefficients; SE = Standard Error; CI = Confidence Interval; *p* = p-value; 'It is difficult to find a partner' = 'Single because it is difficult to find a partner'; 'I prefer to be this way' = 'Single because I prefer to be this way'; 'Just go out of a relationship' = 'Single because I just got out of a relationship'. [a] Effect of sociosexuality on singlehood status after controlling for mediation effec