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The Role of Sexual and Romantic Attraction in Human Mate Preferences

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ABSTRACT

Sex differences in mate preferences are ubiquitous, having been evidenced across generations and cultures. Their prevalence and persistence have compellingly placed them in the evolutionarily adaptive context of sexual selection. However, the psycho-biological mechanisms contributing to their generation and maintenance remain poorly understood. As such a mechanism, sexual attraction is assumed to guide interest, desire, and the affinity toward specific partner features. However, whether sexual attraction can indeed explain sex differences in partner preferences has not been explicitly tested. To better understand how sex and sexual attraction shape mate preferences in humans we assessed how partner preferences differed across the spectrum of sexual attraction in a sample of 479 individuals that identified as asexual, gray-sexual, demisexual or allosexual. We further tested whether romantic attraction predicted preference profiles better than sexual attraction. Our results show that sexual attraction accounts for highly replicable sex differences in mate preferences for high social status and financial prospects, conscientiousness, and intelligence; however, it does not account for the enhanced preference for physical attractiveness expressed by men, which persists even in individuals with low sexual attraction. Instead, sex differences in physical attractiveness preference are better explained by the degree of romantic attraction. Furthermore, effects of sexual attraction on sex differences in partner preferences were grounded in current rather than previous experiences of sexual attraction. Taken together, the results support the idea that contemporary sex differences in partner preferences are maintained by several psycho-biological mechanisms that evolved in conjunction, including not only sexual but also romantic attraction.

Introduction

Our bodies, behavior and preferences have been shaped by biological and cultural evolutionary pressures over thousands of years. Hence, women and men exhibit many similarities in behaviors and preferences across domains. As such, both exhibit equally strong preferences for partners that are kind, healthy and committed (Buss, 2006; Buss & Barnes, 1986; Buss & Schmitt, 1993, 2011; Kenrick et al., 1990; Valentine et al., 2020). However, certain preferences differ between the sexes (Buss, 1989, 2006; Buss & Schmitt, 2011, 2019; Conroy-Beam et al., 2015; Walter et al., 2020). For instance, while men typically place more importance on physical attractiveness and youthfulness in a partner (Buss, 1989; Kenrick & Keefe, 1992; Meltzer et al., 2014; Shackelford et al., 2005; Symons, 1979; Walter et al., 2020), women tend to value social status, ambition, and financial prospects more than men (Buss, 1989; Hopcroft, 2021; Walter et al., 2020; G. Wang et al., 2018).

Different theories have been posited to explain why these sex differences in partner preferences exist and persist (Eagly & Wood, 1999; Eastwick et al., 2013; Gangestad et al., 2006; Zentner & Mitura, 2012). For instance, some preferences for specific partner features differ between cultures, suggesting that they are flexible to current environmental and societal pressures (Eagly & Wood, 1999; Havlíček et al., 2017; Little, Jones et al., 2011; Neto et al., 2012; Toro-Morn & Sprecher, 2003; Zentner & Mitura, 2012). At the same time, a number of large-scale, cross-cultural (replication) studies from the last four decades provided strong evidence that some features (e.g., physical attractiveness, social status) are universally considered more appealing by one sex than the other (Bech-Sørensen & Pollet, 2016; Buss, 1989; Kenrick & Keefe, 1992; Walter et al., 2020; Zhang et al., 2019), suggesting that they reflect general behavioral adaptations to the sex-specific challenges in evolutionary history (Archer, 2019; Buss & Schmitt, 2019; Csajbók & Berkics, 2017; Gangestad et al., 2006; Todd et al., 2007).

Notably, our understanding of behavioral phenotypes, including preferences, benefits from the integration of multiple perspectives that unite ultimate as well as proximate explanations (Bateson & Laland, 2013; Tinbergen, 1963). While sex-specific evolutionary pressures offer an ultimate explanation as to why certain behavioral traits, such as specific partner preferences, may have evolved and are stable across cultures and time, these explanations should align with the proximate explanations, outlining how ontogeny and current psycho-biological mechanisms maintain these behavioral phenotypes. Importantly, ultimate and proximate explanations should not be seen as exclusive or rivaling, but rather complementary perspectives that, if taken together, can greatly enrich our understanding of why and how differences in behavior /preferences emerge and persist.

Proximate explanations for specific partner preferences can involve an ontogenetic perspective, whereby an individual's

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experience over the developmental life course is taken into account (Bereczkei et al., 2004; Fawcett & Bleay, 2009; Hasenkamp et al., 2005; Little et al., 2003; Marcinkowska & Rantala, 2012; Scheller et al., 2021), and a mechanistic perspective, which is concerned with the physiological and psychological factors mediating the expression of the behavior or preference (e.g., Adkins-Regan, 1998; Gildersleeve et al., 2014; Havlíček & Roberts, 2009). While most research in the domain of mate choice has focussed on the explanatory power of genetic determinants or pre-natal, hormonal exposure on brain development guiding partner preferences (Balthazart, 2011, 2016; Bien et al., 2012; Bogaert & Skorska, 2020; Y. Wang et al., 2019), its experiential, psycho-biological underpinnings have been insufficiently explored.

One psycho-biological mechanism that may be able to explain patterns in partner preferences is sexual attraction. That is, experiencing feelings of sexual attraction toward individuals with specific traits could provide a conduit for learning which traits to be interested in, and to develop more stable preference patterns. This is consistent with ultimate explanations, as natural selection acts not only on static partner preferences, but a system of learning and refining partner preferences. In this way, not only sexual, but also other forms of attraction (e.g., romantic, sensual, platonic) that play a role during partner choice could affect partner preferences. However, past research has rarely distinguished these forms of attraction from each other (but see Antonsen et al., 2020; Diamond, 2003, 2004; Fisher, 1998; Fisher et al., 2005, 2006).

To determine the effects of sexual attraction on partner preferences, one may assess the directionality of sexual attraction, or the intensity of sexual attraction. For instance, by comparing trait-specific partner preferences in heterosexual and gay men, or heterosexual and lesbian women, previous research asked whether attraction directed toward the own or the other sex affected the expression of partner preferences. This allowed to test whether the expression of preferences was driven by the own biological sex or by the sex of a potential partner who attraction is directed at. Results largely agreed that the directionality of attraction makes little difference to the expression of partner preferences, which are more strongly influenced by the own sex (Challacombe & Perdomo, 2021; Gobrogge et al., 2007; Kenrick et al., 1995; Lawson et al., 2014; Lippa, 2007; Lucas et al., 2011; Petterson et al., 2018; Valentova et al., 2017). However, while the directionality of sexual attraction may offer insights into the dependence of partner preferences into how one's own biological sex and the sex of a potential partner, it does not probe the broader role that sexual attraction as a psycho-biological mechanism plays for the maintenance of sex differences in partner preferences. To address this question, research needs to target the intensity, rather than directionality, of sexual attraction.

Current Research Questions and Hypotheses

The present study empirically tested the role that sexual attraction plays in the expression and maintenance of sex-specific partner preferences. The main question it addressed is (Q1) whether and how sexual attraction modulates the emergence of sex differences in partner preferences. Partner preferences were assessed in individuals that experience sexual attraction (allosexual) and those that experience reduced or no sexual attraction (asexual/ demisexual/ gray-sexual[1]) toward others. We hypothesized that sexual attraction modulates sex differences in partner preferences. This predicts that the sex differences in preferences toward specific traits that have been evidenced in allosexual (here: heterosexual) individuals would be reduced or eliminated in individuals who show little or no sexual attraction (asexual/ demisexual/gray-sexual individuals). Based on previous research, sex differences in allosexuals were expected for the importance ratings of physical attractiveness (men > women) and status/ resources (men < women) (Buss, 1989; Kenrick et al., 1990; Shackelford et al., 2005; Walter et al., 2020). When sexual attraction decreased (i.e., in demisexual/gray-sexual/ asexual individuals) we expected to find reduced or no sex differences across the partner traits, with, on average, lower importance ratings. Furthermore, to explore (Q1a) whether any effects of sexual attraction on partner preferences depend on the individual's immediate or integrated lifetime experiences of sexual attraction, we assessed whether partner preferences differed in asexual and gray-sexual individuals that never experienced sexual attraction in the past and those that did.

Secondly, following the split-attraction model (Antonsen et al., 2020; Diamond, 2003; Fisher, 1998; Fisher et al., 2005, 2006; Przybylo, 2019; Tennov, 1998), which delineates that attraction to a partner can manifest in different forms, such as romantic, platonic, aesthetic, or intellectual attraction, the present study further tested (Q2) whether romantic attraction might provide a better predictor of sex differences in partner preferences than sexual attraction. Notably, a reduction in sexual attraction does not automatically imply a reduction in romantic attraction. While for many allosexuals, sexual and romantic attraction are aligned and treated synonymously, some individuals experience differences in the intensity and directionality of sexual and romantic attraction (Ybarra et al., 2019). However, this experiential independence becomes even more evident for individuals with reduced sexual attraction. In a recent study, Antonsen et al. (2020) observed that 74% of asexual participants (N = 4032) experienced romantic attraction. Furthermore, many asexuals express the desire to engage in romantic relationships without sexual commitment (Brotto et al., 2010; Van Houdenhove et al., 2015). Indeed, feelings of sexual desire and romantic love have been argued to have evolved to sub-serve different goals, that is, mating and pair-bonding, respectively (Diamond, 2003; Fisher et al., 2005, 2006). Creating an enduring association between individuals, while not directly influencing sexual procreation per se, plays an important role for parental and social care (Fletcher et al., 2015).

Open Science Statement

In order to ascertain comparability with previous studies, we first examined whether sex differences in partner preferences replicated those reported in past studies (Buss, 1989, 2006; Buss & Schmitt, 2011, 2019; Conroy-Beam et al., 2015; Walter et al., 2020) in heterosexual allosexuals. To provide

[1]Asexual individuals do not experience sexual attraction to others. Demi-sexual individuals typically only experience sexual attraction once a strong, emotional connection has been established. Gray-sexual individuals, on the other hand, typically experience reduced sexual attraction to others, or only on rare occasions.

a more data-driven approach, the factorial structure of the research instrument was probed via principal-axis factor analysis. This study used an integrative approach by both replicating and extending previous findings in an appropriately sized sample. The hypotheses, predictors and analyses have been preregistered (https://osf.io/ap7td) and anonymized data is available on the Open Science Framework (https://osf.io/bwem6/). Any deviations from the preregistered analyses are outlined in a separate section at the end of the results.

Two additional questions have been pre-registered that were not necessary to address the main question of this study and can be found in the supplementary material (S3 and S4). These assessed (Q3) the replicability of preference-mediating effects, that is, an individual's belief in indirect appearance effects (Scheller et al., 2021). Indirect appearance effects postulate that a specific characteristic is judged as more important in a potential partner when it indirectly affects how other people perceive oneself, and hence, their own mate value (R. C. Anderson & Surbey, 2014; Little, Caldwell et al., 2011). The other question addressed (Q4) whether the importance of different sensory cues (i.e., visual, haptic, olfactory or auditory) changed with decreasing/increasing sexual attraction, which could point toward a further potential mechanism for maintaining differences in partner preferences between groups.

Method

Participants

Overall, 701 cisgender men and women[2] took part in the study. Out of those, 151 individuals were bisexual, gay, or lesbian according to self-report. The remaining 550 participants reported to be either allo-heterosexual (n_{women} = 83; n_{men} = 83), demi-sexual (n_{women} = 30; n_{men} = 18) gray-sexual (n_{women} = 23; n_{men} = 20), or asexual (n_{women} = 136; n_{men} = 83), or unsure about their sexual orientation (n_{women} = 45; n_{men} = 29). Mean age of the allo-heterosexual group (Mean ± SD: age_{women} = 25.7 ± 9.3 years; age_{men} = 27.6 ± 9.5 years) was similar to that of the demi-sexual (age_{women} = 24.9 ± 6.1 years; age_{men} = 27.1 ± 4.9 years), gray-sexual (age_{women} = 29.4 ± 10.2 years; age_{men} = 24.7 ± 4.2 years), asexual (age_{women} = 25.7 ± 8.4 years; age_{men} = 26.6.1 ± 7.4 years) and the unsure (age_{women} = 22.4 ± 5.3 years; age_{men} = 23.9 ± 6.4 years) groups. The majority of participants were from Europe (49.9%) or the United States of America and Canada (40.7%). The remaining participants came from Australia and New Zealand (2.9%) or from different nations within Central and South America (3.5%), Central and Southern Asia (1.5%), Eastern Asia (0.7%) and Central and Southern Africa (0.7%). Data from two participants that responded consistently with the same importance rating (e.g., always selected "1") were excluded from analysis as it was not possible to ascertain whether task instructions were followed.

To allow comparability with previous studies and across the sample, participants were further filtered by sexual attraction directionality toward the other sex. To that end, they reported the degree to which they experienced sexual attraction to women and to men, using a scale of 1 (not attracted at all) to 7 (highly attracted; see Table 1). The directionality of sexual attraction was quantified via the difference scores of attraction to women versus attraction to men. Only individuals that reported to be attracted to the other sex with at least 3 points more than to the same sex were included in the analysis. Furthermore, individuals that reported to experience sexual attraction to the same sex of at least 4/7 or higher were excluded from further analysis. This was done to ascertain that the sex differences in reported partner preferences were based on the own sex, without intertwining participant's own and preferred sex. After application of this criterion, responses from 155 (93%) self-reported heterosexual individuals as well as 48 (65%) individuals that responded "unsure" in regard to their sexual orientation were retained. Additionally, 8 women and 12 men that self-identified as asexual, gray-sexual, or demi-sexual were excluded as they reported to experience sexual attraction to the same sex with a score of at least 4 out of 7.

Lastly, in order to reduce heterogeneity in the group resulting from changes in partner preferences with age (Boothroyd & Vukovic, 2019; Sprecher et al., 2019), 12 participants that were aged between 50 and 72 years (> 3 SD from the mean age) were excluded from further analysis. Overall, data from 479 participants was included in the final analysis.

Measures

Demographic Questionnaire

Participants completed a demographics questionnaire in which they provided information on their assigned sex at birth, gender identity, age, and nationality.

Sexual and Romantic Attraction Intensity

Sexual orientation was assessed through the Asexual Identification Scale (AIS), a 12-item questionnaire developed by Yule et al. (2015) that offers a comprehensive and reliable instrument to assess asexuality through measures of sexual attraction/desire, sexual activity, sexual identity, sex-related disgust and disinterest in sex, the ability to relate to sexual interest, sexual avoidance and the desire for engaging in sexual activity in relationships. AIS scores were used to index the degree of sexual attraction on a gradient from strong (allosexual) to reduced (demi- and gray-sexual) to absent (asexual) sexual attraction. While AIS scores were used to measure participants' degree of sexual attraction toward others, note that the AIS was primarily developed and validated to differentiate asexual and allosexual individuals (Yule et al., 2015). As such, it incorporates measures beyond mere sexual attraction (such as sex-related disgust, sexual behavior avoidance, and sexual identity), capturing a wider experience of reduced sexual attraction and interest. To confirm that AIS scores provide a good approximation of asexuality and allosexuality, participants further indicated whether they identified as either Asexual, Demisexual, Gray-sexual, Allosexual (heterosexual, bi-/pansexual, lesbian, or gay) or Unsure. AIS scores were mapped against self-identified orientation categories to

[2]A further 180 individuals who did not identify with their sex assigned at birth took part in the study. However, large heterogeneity in gender identity within this sample resulted in small group sizes which required control criteria that lie outside of the scope of the present study.

Table 1. Asexual Identification Scale (AIS) scores, sexual attraction, and romantic attraction scores toward same and other sex partners for the different sexual orientation groups. Higher attraction scores indicate stronger sexual or romantic attraction.

				Sexual attraction toward ...		Romantic attraction toward ...	
Sex	Sexual orientation	*n*	AIS Score	... same sex	... other sex	... same sex	... other sex
Women	Asexual	131	51.53 (6.6)	1.23 (0.6)	1.3 (0.7)	2.85 (2.0)	3.56 (2.1)
	Demisexual	28	37.89 (7.9)	2.39 (1.2)	3.21 (1.6)	3.07 (1.8)	4.61 (1.9)
	Greysexual	18	42.56 (6.7)	2.44 (1.1)	2.94 (1.5)	3.17 (2.4)	4.06 (2.3)
	Allosexual	70	18.20 (7.4)	1.73 (0.6)	6.6 (0.9)	1.67 (1.1)	6.51 (1.2)
	Unsure	32	49.25 (10)	1.59 (0.9)	2.41 (1.9)	2.72 (1.3)	4.47 (1.8)
Men	Asexual	76	48.55 (7.2)	1.21 (0.7)	2.05 (1.4)	1.87 (1.4)	4.45 (2.2)
	Demisexual	12	37.83 (7.6)	1.83 (1.6)	3.92 (1.8)	2.75 (2.3)	4.25 (2.1)
	Greysexual	19	38.26 (9.2)	2.05 (1.5)	4.84 (1.7)	2.26 (1.8)	5.53 (2.1)
	Allosexual	78	15.82 (4.7)	1.35 (0.5)	6.82 (0.5)	1.38 (0.9)	6.78 (0.8)
	Unsure	15	38.81 (16.3)	2.00 (1.2)	3.38 (2.7)	3.31 (2.0)	4.50 (2.2)

ascertain that they aligned with subjective experience of sexual attraction in sexual orientation.

To contrast sexual and romantic attraction with each other directly, participants were further asked to indicate their sexual and romantic attraction strength to both men and women (four measures, one for each sex and one for each type of attraction). Attraction intensity was indicated using a 7-point Likert scale (1 – not attracted at all to 7 – highly attracted; see Table 1). As expected, AIS score and sexual attraction toward the other sex were strongly negatively correlated (r (476) = −0.871; $p < .001$), suggesting they were both converging on sexual attraction intensity. These sexual and romantic intensity scales were used in a second analysis, probing whether sexual or romantic attraction provide a higher explanatory power in sex differences of partner preferences.

As an individual's (a-)sexual orientation is typically shaped gradually by previous, diverse experiences, some participants that identified as asexual may have experienced sexual attraction in the past (Brotto & Yule, 2016; Van Houdenhove et al., 2017). Hence, in order to control for present and previous experience of sexual attraction and to allow sub-group comparisons within the asexual group, those individuals that self-identified as asexual or gray-sexual were further asked to report whether they ever experienced sexual attraction to another person before. This allowed us to assess whether partner preferences may be influenced only by a general or also by a recent absence of sexual attraction to another person.

Mate Preferences

Mate preferences were assessed with a standardized questionnaire that recorded subjective importance ratings of different characteristics in a potential partner. The questionnaire was based on an item list of partner preferences first devised by Hill (1945) and Christensen (1947) and has been used in previous studies to examine sex differences in preferences for physical attractiveness and social status (e.g. Buss, 1989; Buss et al., 1990; Hasenkamp et al., 2005; Hudson & Henze, 2006; Scheller et al., 2021; Shackelford et al., 2005). The survey included 33 items that were subjected to principal-axis factor analysis in order to extract the factorial structure of mate preferences. Sampling adequacy showed that the data was adequate for factor analysis (KMO = 0.90; $\chi^2_{325} = 6134.5$; $p < .001$; see supplementary material S1 for more details on factor analysis and items list). Importance ratings for each item were given on a scale ranging from 1 (absolutely unimportant) to 7 (absolutely indispensable). The items mapped onto four factors, for which we created composite scores: physical attractiveness (10 items, α = 0.89; 95% confidence interval (CI^{95})[0.87 0.90]), social status/financial prospects (4 items; α = 0.75 CI^{95}[0.70 0.77]), conscientiousness (6 items; α = 0.71 CI^{95}[0.67 0.73]), and intelligence/education (3 items; α = 0.79 CI^{95}[0.76 0.81]).

Procedure

The survey was hosted online and distributed via different social media networks (Reddit, Twitter, and Facebook), the Asexuality Visibility and Education Network (AVEN) as well as the University of Bath and University of Aberdeen Psychology Research Participation Schemes. Study advertisements, outlining that the study was looking at the influence of attraction on partner preferences, directed interested volunteers to the online study information, eligibility criteria (16 years or older), and electronic consent procedure. Study completion took between 15–20 minutes. Participation was entirely voluntary, and no incentives were offered. The study received ethical approval from the Psychology Ethics committees at the University of Bath and the University of Aberdeen. Data from participants that responded consistently with the same importance rating were excluded from analysis as it was not possible to ascertain whether task instructions were followed. Duplicated data from one participant was removed.

Analyses

All statistical analyses were carried out in R (version 4.0.3) using the packages: "lme4" for mixed-effect models (Bates et al., 2015), "emmeans" for follow-up contrasts and standardized effect sizes (Lenth, 2020), "ggplot2," "ggpubr" and "sjPlot" for visualization of mixed-effect model estimates (Kassambara, 2020; Lüdecke, 2017; Wickham, 2016).

Note that it is recommended to report unstandardized rather than standardized effect sizes for mixed models (Pek & Flora, 2018), which are given both by the beta coefficient as well R^2. These can directly be compared between partner characteristics in the present study. Upon reviewer request, we also added standardized effect sizes for follow-up comparisons.

Effects of Sexual Attraction on Partner Preferences

Sex differences in partner preferences, as well as the effects of sexual attraction on these differences were assessed using linear mixed-effect models. To control for individual-specific variations in rating level (i.e., individual differences in overall importance magnitude of all partner traits) we included an overall importance rating score that, for each individual, described the mean importance rating for all partner traits. The resulting cluster-based adjustment was applied as the present investigation is not primarily interested in the absolute change of importance ratings of all partner preferences, but the relative importance of each trait, taking into account that overall partner trait importance was reduced with decreasing sexual attraction (β (479) = −0.115 CI^{95}[−0.16 −0.07], $p < .001$). Fixed-effect coefficients are reported along with their respective 95% CIs (CI^{95}), p-values for ease of interpretation, as well as the conditional R-squared statistic for each separate model (Nakagawa et al., 2017), which accounts for the explained variance by both the fixed and random effects. While fixed effect coefficients can be directly used to interpret effect size and directionality of significant interactions, further follow-up contrasts were conducted for ease of interpretation by median-split subgrouping participants into two groups: those that score highly on asexual traits (AIS scores ≥ 37) and those that score low on asexual traits (AIS scores < 37). Estimated marginal means are reported for each pairwise comparison along with Tukey-adjusted p-values and standardized effect sizes.

Outliers in the mixed-effects model analyses were estimated via testing for mean-shift outliers in studentized residuals. Multiple tests were Bonferroni-corrected to control for alpha inflation. Overall, between zero and two responses were removed for each outcome analysis.

To control for the possibility that previously experiencing sexual attraction affects the development of specific partner preferences, the above analyses were followed up with a subgroup analysis contrasting asexual and gray-sexual individuals that reported to have never felt sexual attraction before with those that reported to have felt sexual attraction before. As we were mainly interested in the interaction effects, and as the sample in each subgroup was unbalanced, we used type III ANOVAs (Fox, 2008) to assess the effect of previous sexual attraction on the importance of each partner characteristic.

Romantic Attraction as an Alternative Predictor for Partner Preferences

To test whether romantic attraction might be an equally good or even better predictor of sex differences in the expression of partner preferences than sexual attraction, we compared the added explained variance when including each of the two predictors as an interaction with participant sex. To avoid multicollinearity,[3] this was done via model comparison in separate models. In a first instance, we determined the fixed effect coefficients β for the interaction terms of sexual attraction with sex and romantic attraction with sex in separate models. Higher coefficients are indicative of a stronger sex-specific modulation via the respective predictor (sexual/romantic attraction). Secondly, we determined the extent to which adding the interaction term led to an increase in the proportion of variance explained and an improvement in relative model quality. To that end, we reported the change in both marginal and conditional R^2 between the simple additive model and the interaction model (ΔR^2_m, ΔR^2_c) for each predictor as well as the relative reduction in AIC for the interaction, compared to the simple additive model.

Additionally, to check whether the best predictor significantly explained sex differences in partner preferences, we conducted follow-up contrasts by subgrouping participants into two groups: individuals with high romantic/sexual attraction (attraction scores > 3) and low romantic/sexual attraction (attraction scores < 4). Estimated marginal means are reported for each pairwise comparison along with Tukey-adjusted p-values and standardized effect sizes.

To ensure comparability with previous studies, only individuals that expressed more sexual and romantic attraction toward the opposite, rather than same sex, were included. The same inclusion criteria as in the previous analysis were applied, excluding 7.7% of the above sample, and leaving 442 participants (n_{men} = 190, n_{women} = 252). For direct comparability of predictor strength between sexual and romantic attraction interactions, both predictors were standardized.

Results

Sexual Attraction and Romantic Attraction in the Present Sample

To ascertain that the present sample mapped well onto the spectrum of sexual attraction, measures of sexual attraction (AIS and sexual attraction directionality) were visualized across the different self-identified sexual orientation groups. Figure 1 shows that AIS scores mapped well onto the self-reported sexual orientation groups, while highlighting variation within groups, which would be lost if individuals were grouped by sexual orientation. Individuals that reported to be unsure about their sexual orientation largely aligned with those who reported low sexual attraction, with few individuals showing stronger sexual attraction.

Sexual and romantic attraction directionality showed that most allosexual individuals clustered into distinct groups that exhibited strong sexual and romantic preference toward the other sex. Sexual attraction directionality scores in asexuals, on the other hand, were less widespread along the abscissa, as expected by the reduction in sexual attraction intensity, while they showed variable levels of romantic attraction. Individuals that reported to experience small or moderate sexual attraction largely scattered within the quadrants that describe attraction toward the other sex. As expected, based on previous findings (Antonsen et al., 2020; Ybarra et al., 2019), while romantic and sexual attraction directionality largely aligned in the allosexuals and demi-/gray-sexuals, asexual individuals exhibited considerably more variation in romantic attraction directionality and intensity than sexual attraction. This further supports the suggestion that perceived sexual and romantic attraction do not always align. Group-based attraction scores are

[3]Sexual and romantic attraction were strongly correlated in allosexual (r = 0.735), but to a lesser degree in asexual (r = 0.303) individuals.

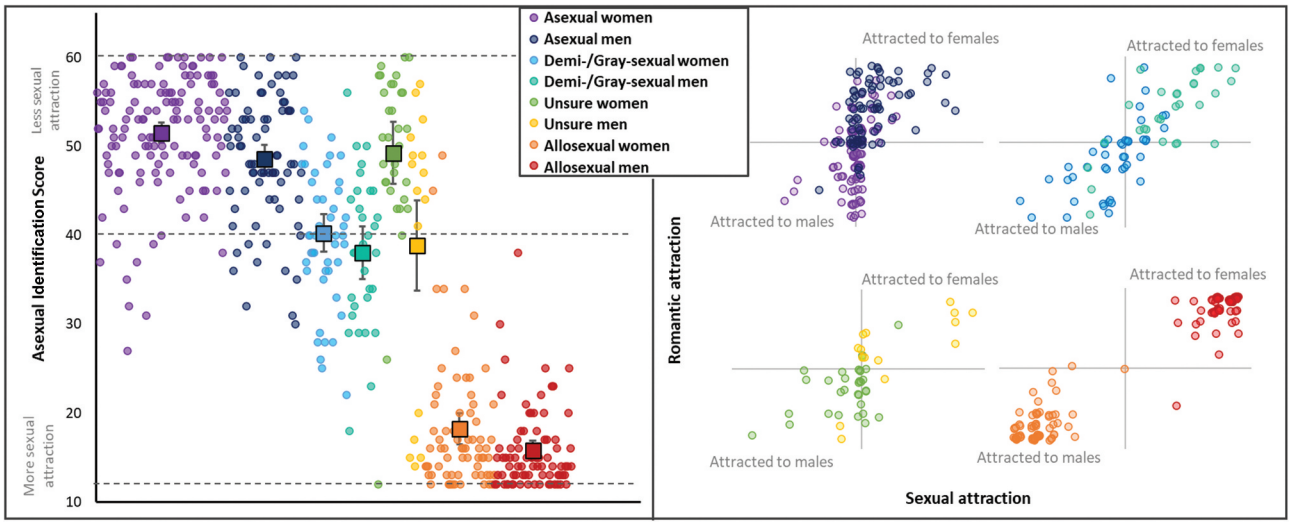

Figure 1. *Left panel*: Asexual identification score distribution across the sample. Higher AIS scores indicate less sexual attraction while lower scores indicate stronger sexual attraction. Small circles indicate individual data, filled squares with error bars indicate group means with 95% CIs. Color-mapping refers to self-identified sexual orientation groups. Dashed lines indicate the lowest and highest possible value as well as the cutoff value suggested by Yule et al. (2015) to differentiate between allo- and asexual individuals. *Right panel*: Sexual and romantic attraction strength toward men and women for the different groups based on self-reported sexual orientation. Each data point indicates one individual. Values closer to the origin indicate lower attraction ratings. Data that falls within the upper right quadrant indicates stronger sexual and romantic attraction to women. Data that falls within the lower left quadrant indicates stronger sexual and romantic attraction to men. Data that falls within the upper left or lower right quadrant indicates cases in which sexual and romantic orientation directionality are misaligned. A small jitter was introduced to each data point to reduce the degree of overlap and increase visibility.

reported in Table 1. Average partner trait importance scores for each sex and self-identified sexual orientation group are reported in supplementary table S2.1.

Effects of Sexual Attraction on Partner Preferences

Sex Differences in Allosexuals

To allow comparability with previous studies, sex differences in partner preferences were initially assessed in the subgroup of allosexual (heterosexual) individuals. Mixed-effects models indicated significant sex differences in all four factors: Men reported significantly higher preference scores for Physical Attractiveness ($\beta(146) = -0.39$ $CI^{95}[-0.64\ -0.13]$; $p = .003$; $R^2_C = 0.643$; $d = 0.30$) as well as Intelligence and Education ($\beta(146) = -0.63$ $CI^{95}[-0.96\ -0.30]$; $p < .001$; $R^2_C = 0.684$; $d = 0.38$). Women, on the other hand, reported higher importance scores for Social Status and Financial Prospects ($\beta(145) = 0.45$ $CI^{95}[0.20\ 0.69]$, $p = .001$; $R^2_C = 0.559$; $d = 0.57$) as well as on Conscientiousness ($\beta(146) = 0.6$ $CI^{95}[0.38\ 0.82]$, $p < .001$; $R^2_C = 0.469$; $d = 0.42$).

Effects of Sexual Attraction on Sex Differences

Physical Attractiveness. Linear mixed-effect models with AIS score and sex as fixed effects and the overall importance score magnitude as random intercept indicated main effects of AIS score ($\beta(479) = -0.014$ $CI^{95}[-0.02\ -0.01]$, $p < .001$; $R^2_C = 0.748$) as well as sex ($\beta(479) = -0.426$ $CI^{95}[-0.76\ -0.09]$, $p = .012$) on the importance of Physical Attractiveness in a partner (Figure 2A). Overall, physical attractiveness was rated more important by men than women, and importance increased with higher levels of sexual attraction. Notably, however, there was no interaction of AIS scores and sex ($\beta(479) = 0.001$ $CI^{95}[-0.01\ 0.01]$, $p = .893$).

Social Status and Financial Prospects. Importance ratings for social status and financial prospects were significantly influenced by AIS scores in interaction with participant sex ($\beta(477) = -0.01$ $CI^{95}[-0.02\ -0.00]$, $p = .004$; $R^2_C = 0.784$). As indicated by the interaction-coefficient, when AIS scores increased, importance ratings decreased more for women than for men (Figure 2B). Follow-up pairwise comparisons via estimated marginal means indicated a sex difference in importance ratings for individuals with high sexual attraction ($Men_{EMM} = 2.06$; $Women_{EMM} = 2.44$; $p < .001$; $d = 0.29$), while this sex difference was absent in individuals with low sexual attraction ($Men_{EMM} = 2.25$; $Women_{EMM} = 2.24$; $p = .919$; $d = 0.01$).

Conscientiousness. The importance of conscientiousness was significantly predicted by an interaction of AIS scores and sex ($\beta(478) = -0.007$ $CI^{95}[-0.01\ -0.00]$, $p = .043$; $R^2_C = 0.735$; Figure 2C). Post-hoc contrasts showed that men in both high- and low-sexual attraction groups had lower importance scores than their female counterparts; however, this sex difference was reduced in individuals with low sexual attraction ($Men_{EMM} = 4.87$; $Women_{EMM} = 5.12$; $p < .001$; $d = 0.21$) compared to those experiencing high sexual attraction ($Men_{EMM} = 4.84$; $Women_{EMM} = 5.32$; $p < .001$; $d = 0.40$).

Intelligence and Education. Importance ratings for intelligence and education were influenced by an interaction of AIS score and participant sex ($\beta(479) = 0.016$ $CI^{95}[0.01\ 0.03]$, $p = .001$; $R^2_C = 0.8$; Figure 2D). Follow-up pairwise comparisons indicated that men with high sexual attraction rated this trait as more important than women with high sexual attraction ($Men_{EMM} = 4.59$; $Women_{EMM} = 4.17$; $p < .001$; $d = 0.27$), while the sex difference in individuals with low sexual

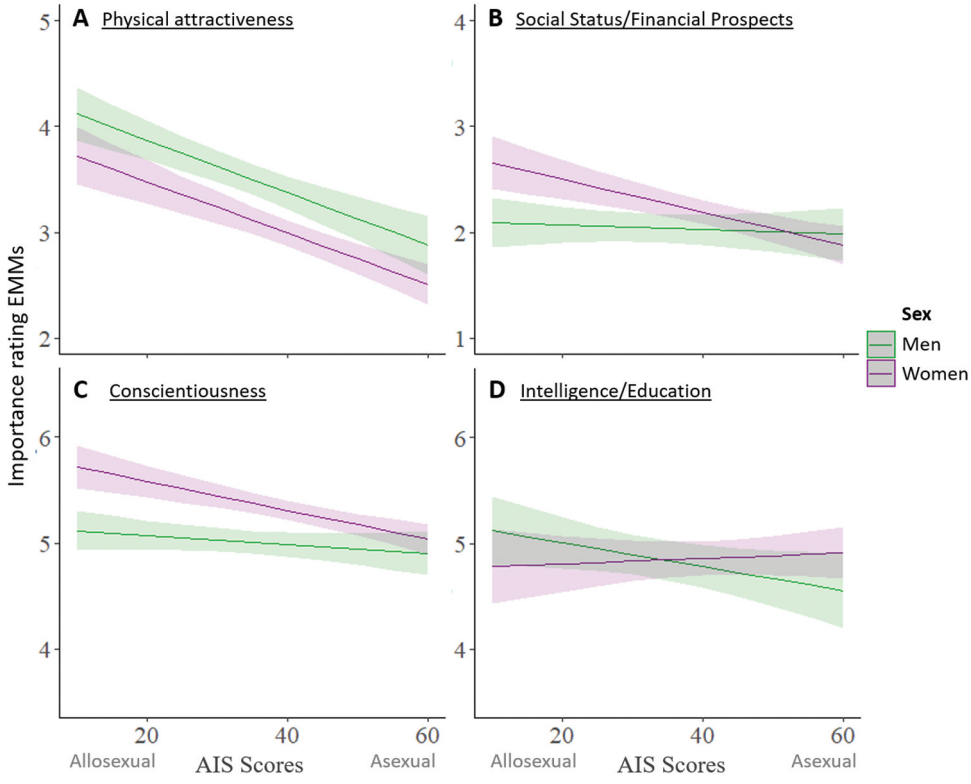

Figure 2. Marginal effects of importance ratings for the different partner characteristics, plotted against AIS scores for men and women separately. Shaded areas indicate CI^{95}. Note that the scale has been adjusted for each partner characteristic to facilitate visualization of the reported effects, and overall importance ratings differ between the traits.

attraction was non-significant (Men_{EMM} = 4.74; $Women_{EMM}$ = 4.9; p = .148; d = 0.10).

Individual main and interaction effects of sex, sexual attraction and indirect appearance beliefs on the four partner traits are listed in supplementary table S2.2.

Subgroup Analysis: Previous Experience of Sexual Attraction in Asexuals and Gray-sexuals

In the above analysis all individuals that self-identified as asexual, gray-sexual and demi-sexual were included, retaining the possibility that previous sexual attraction shaped partner preferences in this group. In order to assess whether previous sexual attraction had an effect on the importance ratings of partner preferences, a follow-up analysis was conducted on individuals that self-identified as asexual or gray-sexual and reported to have experienced sexual attraction before (n_{women} = 31; n_{men} = 39) and those that reported to have never experienced any sexual attraction to another person before (n_{women} = 117; n_{men} = 55).

There was no significant interaction of sex and previous sexual attraction for either factor (Physical Attractiveness: F(1,238) = 0.585, p = .445; Social Status and Financial Prospects: F(1,238) = 2.09, p = .15; Conscientiousness: F(1,238) = 0.086, p = .77; Intelligence and Education: F(1,238) = 1.11, p = .294). The main effect of sex in importance ratings of physical attractiveness was still present across both subgroups of asexual and gray-sexual individuals (F(1,238) = 20.78, p < . 001). There was no other main effect of either sex or previous sexual attraction for either of the other partner characteristics ($p \geq .301$).

Romantic Attraction as an Alternative Predictor for Partner Preferences

Romantic Attraction

To identify whether sexual or romantic attraction possessed more explanatory power for sex differences in partner preferences, we firstly determined the standardized coefficients β for the interaction terms of sexual attraction with sex, and romantic attraction with sex in separate models. We next determined the extent to which adding the interaction term led to a change in the proportion of variance explained (ΔR^2_m, ΔR^2_c), and the improvement in model quality (ΔAIC), compared to the simple, additive model. Table 2 lists these parameters for each model. The better predictor for sex differences in partner preferences is indicated by a larger (direction-independent) standardized interaction coefficient, a larger, positive ΔR^2_m and ΔR^2_c, as well as a larger reduction in the model AIC (ΔAIC).

Physical Attractiveness. Standardized coefficients for the two models with either sexual or romantic attraction as interaction predictors indicated that romantic attraction served as a better predictor for the sex differences in preferences for physical attractiveness than sexual attraction (see Table 2). In contrast to sexual attraction, adding romantic attraction as an interaction with participant sex increased the explained variance. Inspection of the model terms suggested a marginal modulatory effect: while the importance of physical attractiveness was positively predicted by romantic attraction, this effect was stronger in men than in women (β(442) = −0.126 CI^{95}

Table 2. Model parameter estimates for best predictor selection, split for the four partner characteristics: Standardized coefficients, including their 95% CIs, change in marginal and conditional R^2 and change in AIC between the simple additive and interaction models. Bolded numbers represent the model that explains sex differences in the preferences for the respective partner characteristics best, indicated by larger ΔR^2 and more negative ΔAIC.

	Romantic attraction* Sex				Sexual attraction * Sex			
Trait	β [CI^{95}]	ΔR^2_m	ΔR^2_c	ΔAIC	β [CI^{95}]	ΔR^2_m	ΔR^2_c	ΔAIC
Physical attractiveness	**−0.126 [−0.257 0.005]**	**0.002**	**0.005**	**−1.5**	0.005 [−0.118 0.129]	0.000	0.000	2.0
Conscientiousness	**0.174 [0.035 0.313]**	**0.004**	**0.001**	**−3.0**	0.161 [0.027 0.296]	0.003	0.000	−2.2
Social Status/ Financial Prospects	0.171 [0.036 0.306]	0.003	−0.001	−4.1	**0.241 [0.112 0.370]**	**0.007**	**0.003**	**−11.4**
Intelligence/ Education	−0.095 [−0.230 0.041]	0.001	0.002	−1.9	**−0.237 [−0.361 −0.112]**	**0.007**	**0.009**	**−13.7**

[−0.257 0.005], p = .060, Figure 3). On the other hand, there was no evidence for sexual attraction modulating sex differences in the importance of physical attractiveness (β(442) = 0.005 CI^{95}[−0.118 0.129], p = .934). Sex differences in physical attractiveness ratings were smallest in individuals with low romantic attraction (Men_{EMMz} = −0.28; $Women_{EMMz}$ = −0.36; p = .531; d = 0.07) compared to individuals with high romantic attraction (Men_{EMMz} = 0.39; $Women_{EMMz}$ = −0.06; p < .001; d = 0.35).

Social Status and Financial Prospects. Sexual attraction was a better predictor for explaining sex differences in preferences for social status and financial prospects than romantic attraction, indicated by higher standardized coefficients as well as a stronger increase in explained variance (see Table 2). Similar to results from the primary analysis, inspection of model terms indicated that sexual attraction significantly modulated sex differences in preferences for this partner trait (β(440) = 0.241 CI^{95}[0.112 0.370], p < .001, Figure 3), with sex differences increasing with higher sexual attraction. The effect of romantic attraction on sex differences in the importance ratings for social status and financial prospects was qualitatively similar, albeit smaller, as indicated by the interaction coefficient (β(440) = 0.171 CI^{95}[0.036 0.306], p = .013). Follow-up contrasts showed that sex differences in status and financial prospects preferences were smallest in individuals with low sexual attraction (Men_{EMMz} = 0.12; $Women_{EMMz}$ = 0.10; p = .869; d = 0.01), and largest in individuals with high sexual attraction (Men_{EMMz} = −0.03; $Women_{EMMz}$ = 0.35;p < .001; d = 0.28).

Conscientiousness. Sex differences in importance ratings of conscientiousness were best explained by romantic attraction, indicated by higher standardized coefficients as well as a stronger increase in the explained variance (see Table 2). Model terms indicated that romantic attraction significantly modulated sex differences in preferences for this partner trait (β(441) = 0.174 CI^{95}[0.035 0.313], p = .014, Figure 3), with

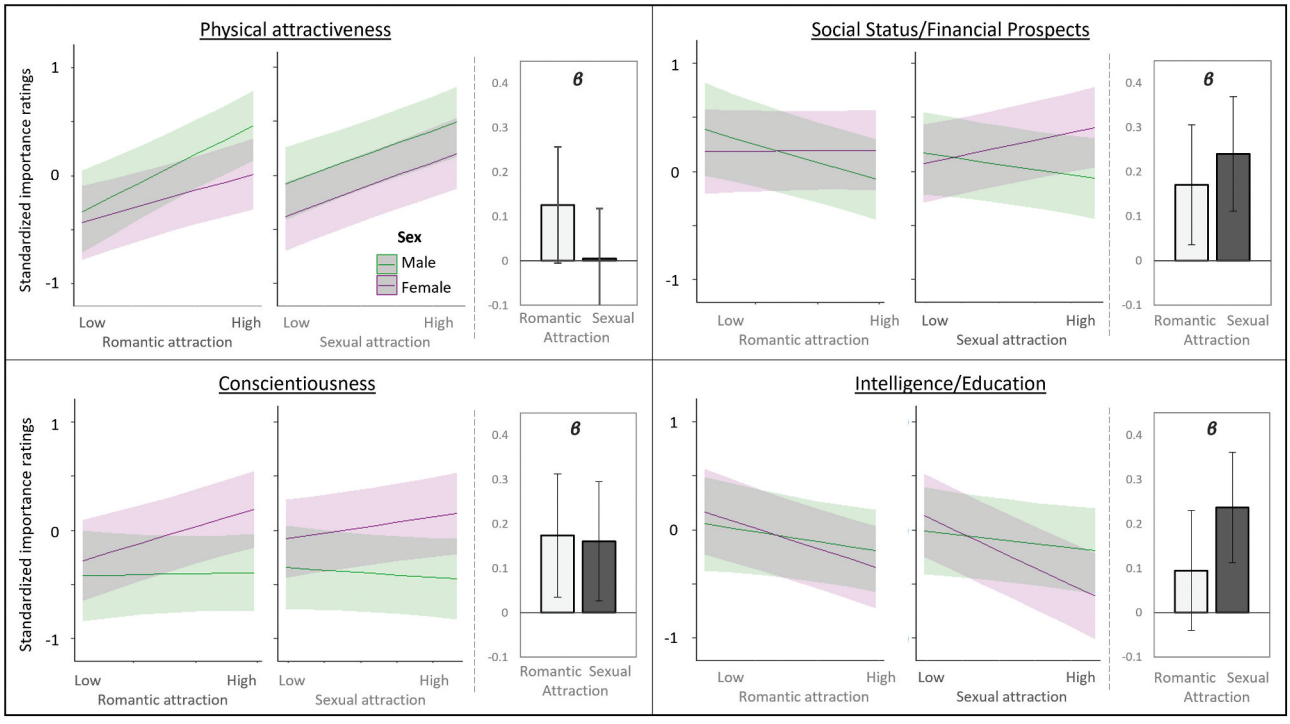

Figure 3. Estimated marginal means of standardized importance ratings of the four partner characteristics, split by participant sex and presented for the two predictors, romantic and sexual attraction, separately. Shaded areas indicate CI^{95}. Bar graphs to the right of each figure indicate the interaction coefficients of each model, indicating the strength of romantic and sexual attraction effects on sex differences in partner preferences. Error bars indicate CI^{95}.

increasing sex differences in people experiencing higher romantic attraction. Again, modulatory effects of sexual attraction were qualitatively similar, albeit smaller ($\beta(441) = 0.161$ $CI^{95}[0.027\ 0.296]$, $p = .018$). Sex differences in conscientiousness ratings were smallest in individuals with low romantic attraction ($Men_{EMMz} = -0.29$; $Women_{EMMz} = -0.17$;$p = .435$; $d = 0.09$) compared to individuals with high romantic attraction ($Men_{EMMz} = -0.43$; $Women_{EMMz} = 0.09$;$p < .001$; $d = 0.39$).

Intelligence and Education. Sex differences in importance ratings of intelligence and education were better explained by sexual than romantic attraction, indicated by higher standardized coefficients as well as a stronger increase in the explained variance (see Table 2). The model terms indicated that sexual attraction significantly modulated sex differences in preferences for this partner trait ($\beta(442) = -0.237$ CI^{95} [−0.361 −0.112], $p < .001$, Figure 3), with increasing sex differences in people experiencing higher sexual attraction. On the other hand, there was less evidence for romantic attraction modulating sex differences in the importance of intelligence and education ($\beta(442) = -0.095$ CI^{95} [−0.230 0.041], $p = .172$). Sex differences in importance ratings for intelligence education were smallest in individuals with low sexual attraction ($Men_{EMMz} = -0.03$; $Women_{EMMz} = 0.08$;$p = .252$; $d = 0.08$) compared to individuals with high sexual attraction ($Men_{EMMz} = -0.18$; $Women_{EMMz} = -0.51$;$p < .001$; $d = 0.25$).

Deviations from Preregistration

Ensuring Group Homogeneity

The preregistrations specified: "In the allosexual group, we will focus only on heterosexual individuals, that is, men and women that identify as heterosexual or report a score of at least 4 points or higher on the sexual attraction scale towards the opposite but not the same sex. This is done to provide a reference group for which sex differences in partner preferences can be predicted based on previous findings." As a deviation from pre-registration, we also applied this criterion to the other sexual orientation groups, leading to the exclusion of data from 8 women and 12 men that identified as asexual or gray-sexual. This was done to aid comparability between the groups, and because high levels of sexual attraction were not anticipated in this group. Additionally, we only included data from individuals that reported to be attracted to the other sex with at least 3 levels more strongly than to the same sex. This criterion was added in order to ensure including only participants with relatively higher sexual attraction toward the other sex, independently of the absolute sexual attraction scores that are taken into account with the first criterion.

Lastly, we excluded data from 12 participants that were aged between 50 and 72 years (> 3 SD from the mean age). This criterion was not specified in the pre-registration as we did not aim to recruit a narrow age range per se. However, as partner preferences change with age (Boothroyd & Vukovic, 2019; Sprecher et al., 2019) and only a small number of participants were aged 50 years or older, excluding these data allowed us to reduce variance resulting from age-related effects. Including these 12 participants did not change the reported effects on preferences for physical attractiveness and status; however, it reduced the interaction effects on preferences for conscientiousness and intelligence.

Note that all effects reported in the primary analysis remained unchanged when age was included as covariate in each model.

Additional Secondary Analyses

The preregistration outlined another secondary, exploratory analysis targeting the effects of libido and openness on partner preferences. However, as libido and AIS score were strongly correlated ($r(478) = -0.757$) this analysis was considered redundant. As expected, sexual desire directed toward other individuals was lower in individuals with higher AIS scores, and higher in individuals with low AIS scores. Furthermore, replacing AIS scores as predictors of importance ratings of physical attractiveness with libido did not lead to significant interaction effects with participant sex ($\beta(478) = -0.032$ CI^{95} [−0.161 0.097], $p = .630$).

We further suggested exploring whether personality traits such as openness may regulate the sex-specific differences across the sexual attraction spectrum, as these have been proposed to differ between allosexual and asexual communities. However, testing self-rated openness scores between the two groups and genders suggested no sex-specific differences between the groups ($p > 0.6$), lending little support for the claim that openness regulates sex differences in these sexual orientation groups, at least in the present sample.

Lastly, the pre-registration outlined an additional investigation of facial attractiveness judgments in asexual and allosexual individuals; however, facial attractiveness data were not analyzed for the purpose of this study to maintain focus on the main question. Furthermore, facial attractiveness ratings tap into similar preferences as physical attractiveness, for which sex differences were not affected by sexual attraction.

Discussion

While sex differences in human mate preferences have been observed across cultures and generations (Buss, 1989; Shackelford et al., 2005; Walter et al., 2020) the proximate factors contributing to its generation and maintenance remain less well understood (but see Alexander et al., 2011; Balthazart, 2011, 2016; Little, Jones et al., 2011; Scheller et al., 2021). Attraction, especially sexual attraction, is a psycho-biological mechanism that is thought to guide interest, desire or the affinity toward specific features of others and establishes an individual's preference profile. In order to better understand how sex and sexual attraction interact, and whether other forms of attraction (i.e., romantic) may explain persistent patterns in mate preferences, we assessed how partner preferences differ across the spectrum of sexual attraction intensity.

In individuals that experience high sexual attraction we replicated well-documented sex differences in partner preferences that are linked to sexual reproduction. Here, heterosexual men rated physical attractiveness higher than women, while the latter placed higher importance on social status and financial prospects than men. This is in line with a large body of research showing sex differences in preferences for these

traits (Bech-Sørensen & Pollet, 2016; Buss, 1989; Walter et al., 2020). The data-driven nature of the factor composition indicated two further partner characteristic factors that were described as conscientiousness (ambition, emotional stability/maturity, reliability, diligence, humor, and sociability) and intelligence/education (be educated, similar education, intelligence). Here, individuals that experienced high sexual attraction showed significant sex differences in preferences, with women rating conscientiousness as more important, while men gave higher importance ratings for intelligence and education. Indeed, previous studies have found conscientiousness, ambition and emotional stability to be more highly valued by women (Botwin et al., 1997; Buss & Schmitt, 2019; Furnham, 2009); however, the enhanced importance ratings of intelligence and education in allosexual men seem to contradict previous findings in hetero-allosexual samples in which women valued education more than men (Buss & Schmitt, 2019; Shackelford et al., 2005). Lippa (2007), however, reported that heterosexual women rated intelligence lower than lesbian women and gay men, which may suggest that sexual intensity and orientation may indeed mediate intelligence importance ratings. As women show lower average sexual attraction levels than men and often show higher levels of non-exclusivity in their sexual orientation (e.g., bisexual preferences; Diamond, 2016), the effect of diversity in sexual intensity and orientation in women may not have been captured in previous studies, but impacted the absolute importance ratings. However, this would likely have affected all partner characteristics, and future research into the effects of sexual orientation and intensity on the importance of specific partner traits is needed to elucidate whether these effects replicate in a different sample.

Effects of Sexual and Romantic Attraction on Sex Differences in Partner Preferences

Notably, our results show that sexual and romantic attraction both help explain the maintenance of sex-specific mate preference differentiation. Self-reported preferences for all four partner traits were significantly or marginally significantly modulated by sex as well as either sexual or romantic attraction. Furthermore, the results support the notion that both forms of attraction can function independently (Diamond, 2003, 2004; Fisher et al., 2005, 2006) and do not affect partner preferences in the same way. While sex-specific differences in preferences for a high social status and good financial prospects (women > men), as well as intelligence and education (men > women) were reduced in individuals with low or no sexual attraction, the increased preferences for a conscientious partner in women was more strongly modulated by romantic than sexual attraction. Surprisingly, the only sex-specific difference that sexual attraction could not account for was the heightened preference for a physically attractive partner in men. Even individuals that reported to have never experienced sexual attraction before showed a sex difference in the preference for this partner trait that was of similar magnitude ($\beta = -0.41$) as that present in allosexual individuals ($\beta = -0.39$). Instead, sex-specific physical attractiveness preferences were more dependent on the degree of romantic attraction, highlighting the importance of physical attractiveness in romantic contexts. Note that, while the interaction of romantic attraction and sex was only marginally significant ($p = .06$), effect sizes suggested that the average explanatory power of romantic attraction was 25 times higher than that of sexual attraction.

This suggests that physical attractiveness may serve more functions than providing good genes. In fact, the heightened preference that men express for physical attractiveness even extends outside of the mating context, affecting other social bonds such as friendships. Here, men place more importance than women on physical attractiveness in opposite-sex friends (Lewis et al., 2011). Perhaps this is due to the indirect benefit gained from being associated with physically attractive individuals. That is, partnering with a physically attractive woman may enhance the perception of someone's own social status and mate value, thereby attaching higher chances of partnering with other attractive woman in the long term (C. Anderson et al., 2001; R. C. Anderson & Surbey, 2014; see supplement S3 for indirect appearance belief effects).

Sexual attraction is not a prerequisite for romantic attraction. In fact, many individuals with reduced sexual desire still experience romantic attraction and look to engage in romantic relationships with others (Antonsen et al., 2020). However, the specific preferences for such romantic, non-sexual relationships may differ. For instance, women with low sexual attraction placed more importance on intelligence and education, and less importance on physical attractiveness, status and financial prospects or conscientiousness than women with higher sexual attraction. At the same time, men with low sexual attraction placed less importance on all partner characteristics, except social status and financial prospects, which already received the lowest importance rankings amongst all character traits. Our results show that sex differences in preferences for conscientiousness and physical attractiveness are better explained by romantic attraction, while those in social status/resources and intelligence are better explained by sexual attraction. This pattern may be explained by the types of benefits accrued in different relationship contexts (Buss & Schmitt, 1993; Li, 2007; Regan et al., 2000). For example, although previous research has often noted potential good-gene benefits from short-term partnerships, a long-term romantic relationship with a conscientious and physically attractive partner would provide commitment, investment, and potentially good gene benefits to offspring. Indeed, as romantic attraction is a crucial factor facilitating pair-bonding and (parental) care in monogamous relationships we might also expect that physical attractiveness will be important if there are associated benefits to offspring. Our data may suggest that, if sexual attraction is associated with short term mating (Edlund et al., 2021; Li, 2007), perhaps the increased preferences for status/resources reflect more material direct benefits from such partnerships.

Furthermore, our data showed that, while sexual and romantic orientation (directionality) were mostly aligned in allosexual individuals, the correlation was markedly lower among those with lower sexual attraction ratings. This divergent sexual and romantic orientation again

suggests that sexual attraction and romantic attraction operate independently not only via their intensity but also their orientation (Antonsen et al., 2020; Diamond, 2004; Tennov, 1998).

Limitations

Firstly, the AIS score was used as an indicator of progressively decreasing sexual attraction in the present study. However, it was primarily developed to differentiate those identifying as asexual from those who do not (Yule et al., 2015). As the AIS incorporates further measures that go beyond mere sexual attraction (such as sex-related disgust, sexual behavior avoidance, or sexual identity), it captures a wider experience of reduced sexual attraction and interest. In order to ensure that the main feature of interest i.e., reduced sexual attraction, was the modulating factor, we included a second, isolated measure of sexual attraction intensity, along with a measure of romantic attraction intensity. Here, participants were asked to indicate how strongly they felt sexually or romantically attracted to men and to women on a 7-point Likert scale. Comparing our findings from the first analysis using AIS scores and the second analysis using raw sexual attraction intensity scores, we found that results were similar across both analyses: both AIS scores and sexual attraction intensity show no interaction with sex in explaining preferences for physical attractiveness, while they both explain sex differences in the preferences for social status, conscientiousness, and intelligence (note that the inverse coefficients result from low sexual attraction being indicated by high AIS scores). This suggests that, while the AIS score offers a more fine-grained and experience-dependent measure of sexual attraction, desire and interest, sexual attraction alone is a large contributing factor to the expression of specific partner preferences.

Secondly, while sexual attraction is considered here as a psycho-biological mechanism that evolved to maintain partner preferences that adapted to evolutionary reproductive pressures, reduced sexual attraction does not automatically equate to a lowered desire to procreate. That is, individuals with reduced sexual attraction may not seek sexual encounters for pleasure but may still express the desire to have and raise children. If the desire is not reduced, this can suggest that partner preferences in people with reduced sexual attraction may not be targeted at a partner with whom genetic material or resources are exchanged to provide for offspring. Instead, the alteration in partner preferences might be driven by other factors, depending on the function of the partnership. Indeed, previous research suggests that the function of a partnership, such as in short-term or long-term mating, alters mate preferences (Bode & Kushnick, 2021; Jonason et al., 2013; Li, 2007). However, we observed, on average, a reduced desire to have and raise children across sexual orientation groups with low sexual attraction (demi-, gray- and asexuals), compared to individuals with high sexual attraction (see supplement S6). This suggests that reduced sexual desire and reduced desire to have and raise children with a partner may shape the expression of specific partner preferences.

Conclusions

Overall, our findings support the notion that sexual and romantic attraction constitute related but separate mechanisms (Antonsen et al., 2020; Diamond, 2003; Fisher, 1998; Tennov, 1998) that subserve the development and maintenance of well-established sex differences in partner preferences. High sexual attraction, which is associated with a higher rate of sexual encounters and therefore higher chances of reproduction (Bode & Kushnick, 2021; Fisher et al., 2002; Pfaus et al., 2012), altered preferences for status/financial prospects, conscientiousness/ambition, and intelligence in a sex-specific fashion, while low sexual attraction reduced those sex differences. At the same time, romantic attraction, more strongly associated with selective mate choice and courtship (Bode & Kushnick, 2021; Fisher et al., 2002), mediated preferences for conscientiousness/ambition more than sexual attraction did. It also better explained the sex difference in preferences for physical attractiveness, which was not affected by sexual attraction. Overall, the present study suggests that both sex and the strength of sexual and romantic attraction influence individuals' mate choice preferences.

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Data Availability

The data associated with this research are available in the project-specific Open Science Framework repository https://osf.io/ap7td.

Open Science

The study has been pre-registered (https://osf.io/ap7td) and provides openly accessible materials on the Open Science Framework (OSF), in the project-specific repository: https://osf.io/bwem6/ Deviations from pre-registration are listed in the results.

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