Sex differences in misperceptions of sexual interest can be explained by sociosexual orientation and men projecting their own interest onto women.

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Abstract

Sex differences in misperceptions of sexual interest have been well documented; however, it is unclear whether this cognitive bias could be explained by other factors. In the current study, 1226 participants (578 men, 630 women) participated in a speed-dating study, where participants rated their sexual interest in each other as well as the sexual interest they perceived from their partners. Consistent with previous findings, we found that men tended to overperceive sexual interest from their partners, while women tended to underperceive sexual interest. However, this sex difference becomes negligible when considering potential mediators, such as the raters' sociosexual orientation, and raters projecting their own levels of sexual interest onto their partners. These findings challenge the popular notion that sex differences in misperceptions in sexual interest have evolved as a specialised adaptation due to different selection pressures in men and women.

Sex differences in misperceptions of sexual interest can be explained by men projecting their own interest onto women.

In theory, accurately detecting sexual interest from opposite-sex members should be evolutionarily adaptive for species with mutual mate choice, such as humans. Doing so allows individuals to increase their adaptive fitness by investing effort into potential mates who are likely to reciprocate sexual interest, while avoiding those who are unlikely to yield a sexual opportunity or not be committed to a relationship, depending on each individual's goals.

When investigating perceptions of sexual interest, we can distinguish between two forms of accuracy/inaccuracy – tracking accuracy and mean-level bias. First, little is known about whether and to what extent individuals can distinguish more and less sexually interested potential mates (i.e., an individual's 'tracking accuracy' regarding their perceptions of sexual interest), especially in the context of brief interactions. If there are universal cues of sexual interest, we might expect high tracking accuracy, but if cues are more idiosyncratic, these cues may not be readily interpretable in brief interactions, and tracking accuracy may be poor or absent. Second, regardless of their ability to distinguish more and less sexually interested potential mates, individuals may exhibit mean-level biases such that they tend on average to overestimate or underestimate others' sexual interest. Indeed, previous research has consistently found that, on average, men overperceive sexual interest from women and women underperceive sexual interest from men (Abbey, 1982; Farris, Treat, Viken, & McFall, 2008; Fletcher, Kerr, Li, & Valentine, 2014; Perilloux, Easton, & Buss, 2012).

This sex difference in sexual interest perception has been explained with Error Management Theory, which stipulates that cognitive biases can evolve over generations when the cost of one type of error is larger than the other type (i.e., a false-hit vs a miss; Haselton & Buss, 2000). In the context of sexual interest perceptions, the sex-differential in the minimum effort required to produce offspring (Trivers, 1972) means it is evolutionarily more costly for men to miss a mating opportunity with an interested woman than vice versa, while it is more costly for women to engage

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in sex with a low quality or uncommitted man than vice versa (Haselton & Buss, 2000; Haselton & Nettle, 2006). Error Management Theory suggests that these sex-differentiated selection pressures led each sex to evolve to bias their perceptions of sexual interest from others in favour of the error that is less costly.

Though the observed sex differences in sexual interest perception fit nicely within the framework of Error Management Theory, there has been limited exploration of potential mediators of the sex difference. Lemay and Wolf (2016) found, in the context of opposite-sex friendships, that factors such as self-perceived attractiveness, or an individual's own sexual interest predicted perceived sexual interest from their opposite-sex friend. Traits such as these that potentially differ between the sexes and are also linked to perceptions of sexual interest could lead to a situation where the sex difference in sexual interest perception is mediated by its association with other traits, which could complicate or challenge the Error Management Theory explanation. Here, we investigate three potential mediators, including those investigated by Lemay and Wolf (2016), as well as sociosexual orientation.

Men, compared to women, tend to show a greater preference for pursuing a short-term mating strategy (Gangestad & Simpson, 2000), and tend to be more open to engaging in uncommitted sexual encounters (Penke & Asendorpf, 2008; Schmitt, 2005). Sociosexual orientation may also be associated with sexual interest perceptions; Perilloux et al. (2012) found in men that short-term orientation was associated with greater perceptions of sexual interest from others (though no significant relationship was found in women), while Howell, Etschells, and Penton-Voak (2012) found that short-term orientation was associated with overperception of sexual interest regardless of sex. One could imagine the link between these traits being an adaptation: it may be more adaptive for individuals, regardless of their sex, who are pursuing a short-term mating strategy to overperceive sexual interest from others so as to avoid missing mating opportunities, and more adaptive for those pursuing a long-term strategy to underperceive sexual interest from others to avoid partners uninterested in a committed relationship.

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Another possible mediator of the sex difference in sexual interest perception is self-rated attractiveness. This could occur if individuals who think they are attractive tend to assume that others do as well (i.e., individuals assume that self-appraisals are similar to others' appraisals of them, see S. L. Murray, Holmes, & Griffin, 2000). Alternatively, individuals may possess insight into their own attractiveness based on previous interactions, which would lead previously successful individuals to both increase their own perceptions of self-attractiveness and over-perceive interest from potential partners in future interactions. Indeed, individuals who perceive themselves as more attractive tend to overperceive sexual interest from a partner (Kohl & Robertson, 2014; Lemay & Wolf, 2016), and men tend to have higher self-perceptions of attractiveness compared to women (Feingold & Mazzella, 1998; Hayes, Crocker, & Kowalski, 1999).

Another possibility is that the sex difference in misperception of sexual interest is explained by greater sexual interest of men in women compared with the sexual interest of women in men. It is known that men, compared to women, are more likely to be interested in a given potential partner (Henningsen, Henningsen, & Valde, 2006). It is also known that individuals' sexual interest in a friend is associated with individuals' perception of interest from the friend (Lemay & Wolf, 2016). The latter association has been interpreted in terms of 'projection' of one's own sexual interest onto others, because longitudinal analysis did not indicate reverse causality whereby individuals first detect interest from someone and then become (more) interested in that person (Lemay & Wolf, 2016); also, Maner et al. (2005) found that experimentally activating a mate-search goal increased perception of sexual arousal in attractive opposite-sex facial photos. Therefore, a sex difference in misperception of sexual interest could be a byproduct of men being more interested in others and projecting that interest onto them. While Lemay and Wolf (2016) found support for projection explaining sex differences in misperceptions of sexual interest within friendship pairs, where feelings would have had the opportunity to manifest (or not) and misperceptions could be reinforced through repeated exposure, it is unclear whether projection explains the sex difference in

misperception between strangers. Note that while we adopt the terminology of 'projection' for concision, we do not infer any specific psychological processes or rule out other causal possibilities.

Our study has two aims: first, we investigate whether individuals can distinguish between sexually interested and uninterested strangers in a short meeting, and second, explore possible mediators of the sex difference in mean-level bias. We conducted a speed-dating study in which we measured individuals' (raters') perception of their partners' sexual interest as well as the partners' self-reported sexual interest in each rater. Accuracy is operationalised as the correspondence between raters' perception of partners' sexual interest and partners' actual reported interest; specifically tracking accuracy refers to whether participants report higher perceive interest from partners who also give higher interest ratings, while mean-level bias refers to raters' overall tendency to over-/under-estimate their partner's sexual interest ratings. We analysed the data using linear mixed effects modelling, which allows us to account for the dyadic nature of the data and investigate mean-level bias and tracking accuracy of perceptions of sexual interest simultaneously. First, we tested whether individuals possess a degree of tracking accuracy for sexual interest perceptions, and whether traits of the raters or their partners influence this tracking accuracy. Second, we assessed sex differences in perception of sexual interest, and whether this association is mediated by traits of the rater, such as the raters' age, sociosexual orientation, and self-rated attractiveness, or is mediated by a sex difference in raters' own interest in the partners.

Method

Participants

Participants were 1226 individuals (586 males, 640 females; $M = 19.77$ years, $SD = 2.88$ years) who were enrolled in a first year psychology course between 2012 and 2018 and recruited as part of a larger study. All participants recruited between these years and met the following criteria were included in the final sample. Participation was conditional on identifying as heterosexual, not

being in a committed relationship, and open to answering personal questions regarding their sexual history. Participants signed-up to testing sessions advertised as a "Speed-meeting study" with a maximum of five males and five females per session; however, there was variation in session size either due to fluctuation in sign-up rates or participants not attending sessions they had signed up for. The total number of sessions was 187 with the average number of participants in a testing session being 3.17 males and 3.44 females, yielding 3850 interactions. The sample size for the current study is much larger than in previous research with a similar design (e.g., Perilloux et al., 2012).

Measures

Sociosexual Orientation Inventory Revised (SOI). The SOI (Penke & Asendorpf, 2008) measures participants' willingness to engage in uncommitted sex on three domains: past behavioural experiences, attitudes towards uncommitted sex, and desire for sex. Each subscale consisted of three items rated on a 9-point scale. Participant's SOI score was operationalised as the sum of all items across all three domains with greater scores indicating more willingness to engage in uncommitted sex (i.e., sociosexually unrestricted).

Self-rated Attractiveness. Participants were asked to rate their own attractiveness on a 7-point scale (1 = Not at all , 7 = Extremely) on four domains: facial attractiveness, bodily attractiveness, personality attractiveness, and overall attractiveness. Self-rated attractiveness was operationalised as the sum of these four items. These items were adapted from Perilloux et al. (2012), with the exception that we added the "personality attractiveness" item.

Procedure

When arriving to the lab to participate in the study, participants first completed an initial questionnaire, which included demographic information and the Self-rated Attractiveness measure. During this time, males and females were separated in different rooms.

Once all participants had completed the questionnaire, participants were instructed that they would be meeting each member of the opposite sex who had also signed up for the testing session. For each meeting they were given three minutes and were instructed that they were free to discuss whatever topic they liked. At the end of the three-minute period, a bell would ring, which would act as a cue for participants to finish their interaction and rate their partner on various traits. Traits that are pertinent to the analyses reported here were participants' ratings of sexual interest in their speed-dating partner on a 7-point scale, as well as the perceived sexual interest of their partner on a 7-point scale (for both items, 1 = not at all, 7 = extremely). These items were taken from Perilloux et al. (2012). Once all participants had completed their ratings, one sex (chosen randomly for each session) would rotate to the next interaction until all opposite sex pairs had met each other.

After the speed-dating task, participants were again separated by sex and completed a final questionnaire, which included the SOI.

Statistical Analysis

The data was analysed using linear mixed effects modelling using the *lme4* (Bates, Mächler, Bolker, & Walker, 2015) and *lmerTest* (Kuznetsova, Brockhoff, & Christensen, 2015) packages in R (R Core Team, 2013). To test the potential influences on perception of sexual interest, we ran five models. For all models, the outcome variable was the rater's perception of partner's interest in them (the rater). Model 1 (Base Model) only included rater sex and age, and partner's actual interest as predictors; this model was conducted to establish base estimate sizes of partner's actual interest, and rater sex on perceptions of sexual interest. In Model 2, we added each of the potential mediators as predictors, which included sociosexual orientation, self-rated attractiveness, and raters' own sexual interest in the partner (we refer to this as the Full Model). In each of the remaining models, we removed one of the potential mediators from the full model to test the potential mediation while controlling for the other variables. All predictors were z-standardised at the appropriate group-level before being entered into the model (i.e., age, SOI, self-rated attractiveness at the rater level,

partner's actual sexual interest and rater's own sexual interest at the rater-partner interaction level, i.e., grand-mean centred). As a result, estimate sizes can be interpreted as the change in the 7-point scale of the outcome variable for every 1 standard deviation increase in the predictor. Rater sex was effect coded (-.5 for female, .5 for male). Terms for interaction between partners' actual sexual interest and all rater-level variables were included to test whether traits of the rater influenced tracking accuracy of perceptions of sexual interest. To account for non-independence, random intercepts were specified for each rater, partner, and speed-dating session. Random slopes were specified maximally following recommendations in Barr, Levy, Scheepers, and Tily (2013) and Barr (2013). We assessed for causal mediation via bootstrapping using the *mediate* package in R (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014) with a simplified random effect structure. The fixed effects are reported here; for full model specifications and results, including estimated random effects, see the supplementary materials. We ran an additional model that included rater mean-interest as an additional predictor to control for potential between-rater effects (e.g, differences in scale usage). Results from this model did not change the interpretation, therefore we include this model in the supplementary materials. We also ran a model including additional predictors of partner traits to test whether perceptions of sexual interest were more accurate for certain partners (e.g., do sociosexually unrestricted partners give more easily interpretable cues of sexual interest?); this additional analysis is reported in the supplementary materials. The dataset, analysis code supporting this article, and full model results can be accessed at osf.io/je4h7.

Results

Correlations between all participant-level predictors were $r < .33$, indicating that levels of multicolinearity were not problematic (see Supplementary Materials for full details). The fixed effect estimates for base and full models are reported in Table 1 (see Supplementary Materials for full results for all models).

Tracking Accuracy

In all models, there was a small, but significant main effect of partners' actual sexual interest on raters' perceived sexual interest, suggesting that raters were somewhat accurate in perceiving the sexual interest of their partners. However, none of the interactions between rater traits (sex, age, SOI, and self-rated attractiveness) and partners' actual sexual interest were significant; that is, none of the rater traits included in the model were significantly related to the tracking accuracy of perceptions of sexual interest. Also, there was no significant interaction between raters' own sexual interest and partners' actual sexual interest, indicating that being interested in a partner was not significantly associated with increased accuracy of sexual interest perceptions.

Table 1. Fixed effect estimate for both the Base and Full Models predicting rater's perceived sexual interest received from partners. For results of all models, including full models with potential moderators removed, see the Supplementary Materials.

	Base Model			Full Model		
	Estimate (Std. Error)	*t* (approx. *df*)	*p*-value	Estimate (Std. Error)	*t* (approx. *df*)	*p*-value
Intercept		101.58			129.60	
	3.28 (.03)	(1077.53)	<.001***	3.31 (.03)	(179.50)	<.001***
Rater Sex	.44 (.07)	6.71 (175.28)	<.001***	.03 (.05)	.64 (209.81)	0.522
Rater Age	-.05 (.03)	-1.60 (1249.08)	0.109	-.07 (.03)	-2.56 (923.47)	.011*
Rater SOI				.15 (.03)	5.13 (180.19)	<.001***
Rater Self-rated Attractiveness				.35 (.03)	14.02 (135.70)	<.001***
Rater's Sexual Interest				.54 (.02)	28.78 (908.95)	<.001***
Partner's Sexual Interest	.11 (.02)	5.54 (144.12)	<.001***	.08 (.02)	5.16 (157.06)	<.001***
x Rater Sex	.03 (.03)	.83 (780.38)	0.408	.04 (.03)	1.14 (173.16)	0.257
x Rater Age	.00 (.02)	.28 (945.55)	0.782	.00 (.01)	.23 (1712.40)	0.816
x Rater SOI				.00 (.02)	.23 (919.32)	0.82
x Rater Self-rated Attractiveness				.01 (.01)	.92 (1473.00)	0.358
x Rater's Sexual Interest				-.02 (.02)	-1.27 (130.55)	0.206

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

Mean-Level Bias

When investigating mean-level bias in perceptions of sexual interest, in the Base Model (i.e., the model without any potential mediators), we found that there was a significant main effect of sex, such that men perceived higher levels of sexual interest from their partners compared to women; this is consistent with previous research suggesting that men are more likely to overperceive sexual interest compared to women. We also found that there were significant main effects of rater age such that younger participants perceived higher levels of sexual interest from their partners.

In the Full Model (i.e., with raters' own sexual interest and all potential mediators as predictors), there were significant main effects of raters' SOI and self-perceived attractiveness, such that participants who were oriented toward short-term relationships, and those who rated themselves as more attractive, perceived higher levels of sexual interest from their partners. The largest effect was a significant main effect of raters' own sexual interest on raters' perceived interest from a partner, consistent with raters projecting their own interest onto their partner. With these potential mediators in the model, the main effect of rater sex on perceptions of sexual interest found in the Base Model is no longer significant. This suggests that this sex difference can be collectively explained by the potential mediators.

To test the influence of each individual mediator, we conducted an additional three models in which one mediator was dropped. If the dropped mediator helps explain the sex difference between sex and perceived sexual interest, we should see an increase in the sex effect when compared to the Full Model. Indeed, for all three predictors, the sex effect becomes significant when dropping the mediator from the model. However, causal mediation analyses found that only SOI and rater's own sexual interest significantly mediated the association between sex and perceived sexual interest (see Table 2). Collectively, these findings suggest that the sex difference in misperceptions of sexual interest can be explained by a combination of men scoring higher on sociosexual orientation, which in turn is positively associated with perceptions of sexual interest,

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and men being more interested in their partners and this interest being associated with perceived interest from their partners. Main effects (representing factors influencing mean-level bias) for all models are visualised in Figure 1.

Table 2. Causal Mediation Analysis for each potential mediator and the association between rater sex and perceived interest received from partners (with 95% confidence intervals).

	Average Direct Effect	Average Causal Mediated Effect	Proportion Mediated
Rater SOI	.04 [-.06, .15]	.13 [.09, .17]***	.76 [.44, 1.87]***
Rater Self-rated Attractiveness	.01 [-.09, .12]	.03 [-.09, .08]	.43 [-5.06, 5.92]
Rater's Sexual Interest	.00 [-.10, .10]	.18 [.13, .23]***	.98 [.64, 2.37]**

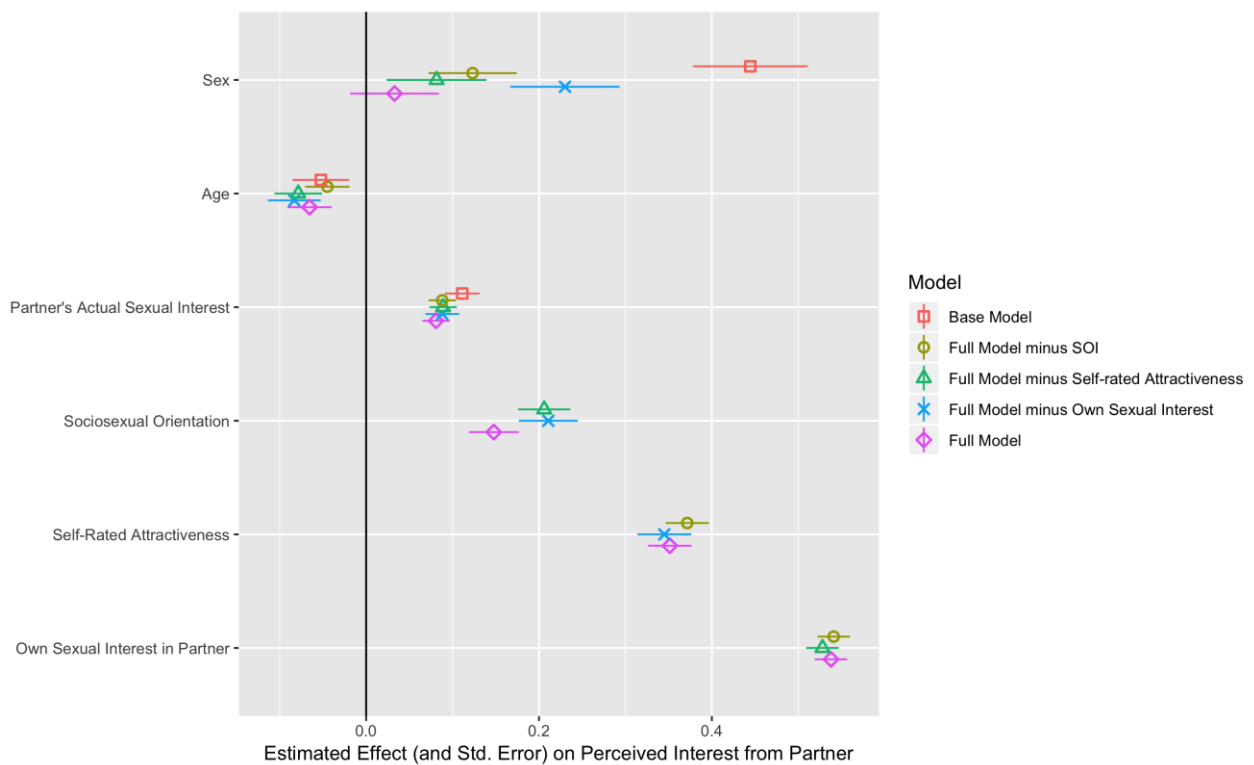*p < .05 ** p < .01 *** p < .001

Figure 1. Fixed effect estimates for main effects in Base Model, Full Model, and models without each potential mediator. When raters' sociosexual orientation, self-perceived attractiveness, and own sexual interest is included in the model, the effect of sex on perceived sexual interest becomes non-significant.

Discussion

When assessing the tracking accuracy of sexual interest perceptions, we found that there was a significant association between the rater's perceived interest from the partner and partner's actual interest. This suggests that 1) raters can accurately perceive cues of sexual interest from their partners, and 2) these cues could be detected from brief interactions with strangers, suggesting either that such cues have commonalities across individuals or that idiosyncratic cues of interest are easily interpretable even after limited acquaintance. However, in comparison to the other predictors in the model, the effect size of partners' actual interest was smaller than any rater-level predictors, or the effect of rater's own interest in the partner. This suggests that partner's actual sexual interest (and therefore, tracking accuracy) play a relatively minor role in perceptions of sexual interest from brief interactions with strangers.

When investigating mean-level bias in perceptions of sexual interest, we found that men, more so than women, tended to overperceive sexual interest from partners, consistent with previous findings (Abbey, 1982; Farris et al., 2008; Fletcher et al., 2014; Perilloux et al., 2012). However, this sex difference was not significant once sociosexual orientation, self-rated attractiveness, and raters' own sexual interest in their partner were included in the model. The estimated effect of sex in the Full Model was 6.8% the size of the sex effect of the Base Model, and, given the large number of observations, the confidence interval around this estimate is small. Further examination found that the association between sex and perceptions of sexual interest was significantly mediated by raters' sociosexual orientation and by raters' own levels of sexual interest in the partner. Also, in

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all cases, the direct effect of sex on perceptions of sexual interest was non-significant. Overall, these findings suggest that any residual effect of sex is likely to be very small or zero.

We found that sociosexual orientation was also positively associated with perceptions of sexual interest, such that a greater orientation to short-term, uncommitted relationships was associated with perceiving more sexual interest from partners. This is consistent with Error Management Theory, as it suggests that individuals may bias their perceptions of sexual interest according to their sexual strategy. For instance, individuals open to uncommitted sex may overperceive sexual interest in order to maximise mating opportunities, while individuals oriented toward long-term relationships may underperceive interest to avoid partners uninterested in a committed relationship. Given that sociosexual orientation also significantly mediated the association between sex and perceptions of sexual interest, our results suggest that the sex difference in overperception of sexual interest is, in part, due to sex differences in sociosexual orientation. This may be adaptive, given that a short-term mating strategy is thought to be more evolutionarily beneficial for men than for women (Gangestad & Simpson, 2000). A separate analysis of the subcomponents of the SOI found that the main effect of SOI was driven by the behaviour and desire subcomponents, but not the attitudes subcomponents (full results of this model are reported in the Supplementary Materials).

However, the mediator with the largest influence on perceptions of partner interest was the rater's own interest in the partner, in line with previous findings in friendship pairs (Lemay & Wolf, 2016). This finding is not consistent with the popular notion that the sex difference in misperception of sexual interest has evolved via sex-specific specialised adaptations because it is advantageous for men to overperceive and women to underperceive sexual interest. Error Management Theory does not predict that sexual interest perceptions in a person should depend on one's own sexual interest in the person; when this unpredicted effect is accounted for, the predicted sex difference disappears (this is evident by comparing the 'Full Model' with the 'Full Model minus rater's sexual interest' in Figure 1). It could be argued that projection is just the proximate mechanism for the evolved sex

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difference in sexual interest perception; however, this seems unlikely to us, given that directly shifting the sex-specific means in sexual interest perceptions only requires quantitative changes – a straightforward outcome of sex-specific selection on existing quantitative variation – whereas for sex-specific selection to create a sex difference that works via projection would require the evolution of a new, qualitatively different psychological mechanism to link perceptions of a person's sexual interest to one's own interest in that person. A more parsimonious evolutionary explanation for projection would be that the tendency for individuals to assume that potential partners reciprocate their sexual interest led to increase mating success regardless of sex (for instance, by decreasing the chances of missing mating opportunities with high quality mates). However, we note that the mediating effect of projection exists even when controlling for the effect of sociosexual orientation, suggesting that this effect is, at least in part, independent of mating strategy. Alternatively, this bias may not reflect a specialised adaptation at all, but instead reflect a broader tendency for individuals to assume that others think like themselves (e.g., the false-consensus bias, or the assumed similarity bias; for a review, see Marks & Miller, 1987).

While we have taken the perspective that rater sexual interest influences their perception of partner sexual interest, another interpretation is that individuals first detect interest from a partner (accurately or not) and as a result become more interested in them. Such a process may be adaptive as it may motivate individuals to direct mating efforts towards likely potential partners. However, a causal mediation analysis between rater sex and rater sexual interest found that only 25.5% of this association was mediated by perceived interest received from the partner (considerably lower than the mediated proportion found in line with the projection explanation; full results reported in the supplementary materials). Also, Lemay and Wolf (2016) did not find support for this reverse causal effect when conducting a longitudinal analysis on perceptions of sexual interest among friendship pairs.

Raters who perceived themselves as attractive were more likely to overperceive sexual interest from their partner. This effect persisted even when accounting for the partners' actual

interest, suggesting this bias is invariant to actual cues of interest displayed by the partners. A simple explanation for this association is that individuals who perceive themselves as more attractive expect to receive greater interest from potential partners. If we assume that individuals have some insight into their own attractiveness (indeed, self-rated attractiveness was positively associated with received sexual interest from partners in our sample), this finding could suggest a learning effect, where individuals who have received interest in the past raise their internal representation of their own attractiveness, which in turn influences their perceptions of sexual interest from potential partners in future interactions. While removing self-rated attractiveness from the Full Model led to a significant main effect of sex, we did not find that this was a significant mediation.

While we found that individuals possessed modest tracking accuracy in sexual interest perceptions even after brief interactions, this was not significantly influenced by any of the individual difference traits measured in the current study. We also did not find a significant influence of rater's own interest on accuracy of sexual interest perceptions, which suggests that being interested in a potential partner does not make individuals more able to attend to or interpret possible cues of sexual interest.

While we have interpreted the correspondence between partner's actual interest and rater's perceived interest as "accuracy", one criticism of studies such as ours that investigates the purported sex difference in misperception of sexual interest is that the effect could in principle reflect women under-reporting their own interest rather than men over-perceiving women's interest (Engeler & Raghubir, 2018; Perilloux & Kurzban, 2015; but see Murray, Murphy, von Hippel, Trivers & Haselton, 2017). However, this alternative explanation is difficult to reconcile with the current findings, given that the sex difference in misperception can be fully accounted for by the mediators in the Full Model, and it is unlikely that men projecting their interest or being more sociosexually unrestricted leads to women more accurately reporting their sexual interest. Another consideration is the potential disconnect between participants' actual beliefs about perceived sexual interest and

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how these perceptions have been measured (i.e., a behavioural response on a Likert-type scale), the latter potentially being influenced by external factors (e.g., demand characteristics), which may obscure true effects.

Previous theories for the purported sex differences in misperceptions of sexual interest emphasise that men and women have evolved different psychologies due to sex-specific selection pressures. Our findings challenge this popular notion by showing that the sex difference can be completely explained by the mediators in the Full Model, with raters' own sexual interest having the strongest mediating effect. Defenders of the interpretation forwarded by Error Management Theory would need to explain how these results could reasonably be incorporated.

Author Contributions

A. J. Lee and B. P. Zietsch developed the study concept. A. J. Lee, M. J. Sidari, and B. P. Zietsch contributed to the study design. Testing and data collection were performed by A. J. Lee, M. J. Sidari, and J. M. Sherlock. A. J. Lee, M. J. Sidari, S. C. Murphy, and B. P. Zietsch performed the data analysis and interpretation. A. J. Lee drafted the manuscript, with all authors providing critical revisions. All authors approved the final version of the manuscript.

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