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ORIGINAL PAPER

Sex Differences in Response to Deception Across Mate-Value Traits of Attractiveness, Job Status, and Altruism in Online Dating

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Abstract

Sex differences in mate preferences are well established. It is also well understood that humans often seek to manipulate their standing on important mate-value traits. Yet, there is a paucity of work examining potential sex differences in response to deception along these important dimensions. In Study 1, a sample of 280 undergraduates (123 females) responded to a hypothetical online dating scenario asking participants to rank how upset they would be if deceived about a date's attractiveness, occupation, or volunteerism. Women ranked occupation deception as more upsetting than men did, and men ranked attractiveness deception as more upsetting than women did. Given potential measurement differences between forced-choice and continuous response options, Study 2 randomly assigned 364 undergraduates (188 females) to one of the deceptions conditions and asked them to report their level of upset and willingness to go on the date using a continuous response scale. Women were more likely than men to cancel the date if the deception involved volunteerism or occupation. There was no significant sex difference in the attractiveness condition. Neither mate value nor sociosexuality moderated the sex difference in the levels of upset due to the deception. Together, these findings demonstrate that women and men exhibit differences in the degree to which they become upset by opposite sex deceptions in online dating, regardless of self-perceived mate value and sociosexuality, in alignment with evolved sex differences in mate preferences.

Keywords Online dating · Dating deception · Sex differences · Mate-value · Sociosexual orientation · Mate preferences

Introduction

With almost 50 million users and nearly 8000 different digital services available globally, online dating is becoming an increasingly common approach to search for a mate. Although online dating can facilitate finding a partner, the lack of initial physical interaction coupled with the ability to curate one's image and information put forth to prospective mates allows for the possibility of deception in important areas of mate choice. For example, Toma, Hancock, and Ellison (2008) found that 81% of online daters included information in their profile that differed from the truth.

Deception can be defined as the act of causing someone to accept information as true or valid what is really false or invalid (Merriam-Webster, 2019). Deception has been implicated in many facets of society, including in mating relationships (Rowatt, Cunningham, & Druen, 1998). Both women and men sometimes engage in deception when trying to attract a mate, and such deceptions appear to align closely with evolved mate preferences held by the opposite sex. Men tend to deceive about their status and/or their career, whereas women tend to deceive in order to appear more youthful and attractive (Abramova, Baumann, Krasnova, & Buxmann, 2016). Even when both sexes engage in deception within the same domain, they do so in characteristically different ways. For instance, when deceiving about one's physical appearance in an online dating profile, men are more likely to exaggerate their height, whereas women are more likely to underreport their weight (Toma et al., 2008).

Although some research has recently explored sex differences in perpetrating dating deception, relatively little

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is known about how people react to being deceived by a potential mate. If selection has shaped divergent tendencies between men and women to deceive members of the opposite sex in order to appear more desirable to prospective mates, then sex differences should also exist in the degree to which men and women become *upset* by being deceived by a prospective mate across different mate-value dimensions. Accordingly, the goal of this study was to examine potential sex differences in response to imagined online dating deception among young adults across three domains of mate value that differ in importance between the sexes: status/resources, physical attractiveness, and altruism.

Deception and Mate Preferences

Research has established that individuals can alter their mate value, defined as an individual's desirability as a mate (Sela, Mogilski, Shackelford, Zeigler-Hill, & Fink, 2016), by using dishonest signaling via manipulation of one's self-presentation (Gibbs, Ellison, & Heino, 2006). Deception is often used when initiating a relationship to attract a potential mate (Rowatt et al., 1998).

According to Darwin's (1896) theory of sexual selection, humans compete intrasexually and intersexually for reproductive success. Such competition can include exaggeration of traits that are linked to the mate preferences of the opposite sex (Buss, 1988). Males more than females seek youth and physical attractiveness in potential mates (Buss, 1989). Females physical attractiveness serves as a cue to their reproductive capacity; identification of such females was an important reproductive challenge for ancestral males (Buss, 1989; Chang, Wang, Shackelford, & Buss, 2011). Not surprisingly, the male preference for physically attractive females has also been identified in the online dating context (Abramova et al., 2016). Specifically, men prefer online dating profiles from attractive, younger, and shorter women (Hitsch, Hortaçsu, & Ariely, 2010), and women who were more attractive received more emails from prospective mates (Hitsch, Hortaçsu, & Ariely, 2005).

Conversely, females more than males prefer mates with higher social status and resource acquisition and provision capabilities (Buss, 1989). Good earning capacity, social status, education, intelligence, ambition, and industriousness are examples of characteristics that have been found to be highly sought after by women (Chang et al., 2011; Toma et al., 2008). Buss (1989) suggested that indicators of resource acquisition are more important for females because ancestral women's reproductive success was constrained by access to resources. This preference has also been observed within the online dating literature, such that women, more than men, value a partner's socioeconomic status (Abramova et al., 2016). A study conducted by Hitsch et al. (2005) found that men with higher income received more emails from prospective dates. Furthermore, women prefer online dating profiles of men with higher income than them, as well as men with occupations such as lawyer, law enforcement, firefighter, military and health professional (Hitsch et al., 2010).

Related to direct status and resource indicators is the mate preference for altruism, for which women appear to exhibit a stronger preference than men (Farrelly, 2013; Oda, Okuda, Takeda, & Hiraishi, 2014; Phillips, Barnard, Ferguson, & Reader, 2008). Due to this preference, men tend to increase their self-presentation of altruism. Men have been found to contribute more to charity if a member of the opposite sex is observing than when an individual of the same sex was observing, or if there is no observer at all (Iredale, Van Vugt, & Dunbar, 2008). Furthermore, men tend to exaggerate their levels of trust, sincerity, and kindness more than women when trying to impress a potential mate (Tooke & Camire, 1991).

In light of these sex-divergent mate preferences, it is unsurprising that men and women also differ from one another in the manners by which they attract mates. Females are more likely to employ tactics for altering physical appearance, such as wearing makeup or revealing clothing to attract males, whereas males are more likely to display resources, athleticism, and strength to attract potential mates (Buss, 1988). These sex differences in the display of mate-value characteristics have also been extended into the deception and self-presentation literature. Rowatt et al. (1998) found that men with high self-monitoring (i.e., being more sensitive to their audience's expressions) were more likely to alter their self-presentation based on what women prefer in a mate. When trying to impress potential mates, men were more likely to attempt to deceive women about their levels of dominance (i.e., by acting more dominant or masculine around both members of the same and opposite sex) and resources (i.e., by spending money on members of the opposite sex even when they cannot afford it and mislead them about their career expectations), whereas females were more likely to deceive about their bodily appearance (Tooke & Camire, 1991). Not only did men deceive more about social status indicators, they were also more accepting when a woman lied about these cues than when other men used these deception tactics (Toma et al., 2008), suggesting that sex differences in response to deceptions surrounding mate-value traits might exist.

Deception in Online Dating

Deceptive self-presentation has become easier with the emergence of online dating and mobile app dating. Research indicates that online daters report deception being the primary disadvantage of online dating, and over a quarter of online daters reported misrepresenting certain aspects of their profiles (Brym & Lenton, 2001). Surveys have indicated that

86% of online daters felt that others misrepresented their physical appearance on online dating websites (Gibbs et al., 2006), and they believed the other person was more deceptive than they were (Sharabi & Caughlin, 2019). When creating online dating profiles, individuals will base their presentation on their idealized self, which can conflict with a more accurate representation of their traits (Ellison, Hancock, & Toma, 2011). Most deceptions on mobile dating applications were done at the beginning of the interactions between two users (Markowitz & Hancock, 2018). Moreover, individuals rated discrepancies involving traits that could be easily changed or minimized before the first date as more acceptable to lie about than traits that could not be easily changed (Ellison et al., 2011), suggesting that there is likely a strategic component surrounding the manner by which we mislead others in our online dating behavior.

Because there is no initial face-to-face interaction, deception is easier to engage in and more difficult to detect (Toma et al., 2008). Therefore, dishonest signaling and the manipulation of self-presentation would be potentially useful in online dating context when individuals are competing against a plethora of other prospects. Not surprisingly, deception researchers have observed sex differences in the perpetration of online dating deception that map on to those described above. Women were more likely to be dishonest about their weight and physical attractiveness, whereas men were more likely to be dishonest about their personal interests, their assets, and mating goals (Abramova et al., 2016). Women posted less accurate pictures of themselves as their profile pictures of dating websites, where most of the discrepancies between the picture and their real self was due to physical attractiveness features (i.e., skin, hair style, and age) (Hancock & Toma, 2009). When primed with a first date scenario with an attractive individual, men were more likely to engage in acts of conspicuous spending relative to women (Griskevicius et al., 2007). Men have been found to consistently overestimate their height in their profiles, a cue which is associated with higher status men (Toma et al., 2008). Men also indicated a higher social acceptance of deception in these areas (Toma et al., 2008).

Although evidence suggests that individuals sometimes attempt to alter their self-presentation by employing deceptive tactics in online dating (Abramova et al., 2016; Ellison et al., 2006; Hitsch et al., 2005, 2010; Toma et al., 2008), there is a lack of research on individuals' reactions to these deceptions, and whether sex differences exist in the extent to which they are upsetting to men and women. Given that deception across mate-value traits such as attractiveness and status is pervasive in the modern online dating context, it is important to study how men and women respond to such deceptions. To our knowledge, only one study has examined the receiver's reaction to online dating deception. Steiger, Eichinger, and Honeder (2009) found both males and females were more disturbed about gender switching (e.g., a female pretending to be a male online), followed by augmentation of physical appearance and age deceptions. However, this study lacked examination of the sex differences between different types of deceptions. Based on the aforementioned literature on mate preferences, it is anticipated that sex differences will exist in the forms of deception that are most upsetting, such that males will be more upset than females surrounding physical attractiveness deceptions and females will be more upset than males regarding deceptions surrounding access to, and sharing of, resources.

Might Mate Value and Sociosexuality Moderate Sex Differences in Upset over Dishonesty?

Two factors that might moderate sex differences in the types of deception that are most upsetting are individuals' sociosexual orientation and mate value. Research has found that both men and women were less upset about deceptions in a short-term versus long-term mating scenario (Haselton, Buss, Oubaid, & Angleitner, 2005). With resource exaggeration deceptions, females' upset was greater than male's only for long-term relationships; for short-term mating, there were no significant differences between the sexes (Haselton, et al., 2005). In terms of deception about kindness, females were more upset than males, but only in in short-term mating scenarios (Haselton et al., 2005). Moreover, previous research has found that unrestricted individuals tend to prioritize physical attractiveness in a partner, whereas more restricted individuals exhibit stronger preference for kindness and reliability (Simpson & Gangestad, 1992). Together this suggests that sociosexuality, as an individual difference measure of relationship orientation, could moderate the sex differences in the level of upset due to deceptions surrounding specific mate-value traits. Additionally, individuals with higher mate value are generally more selective across partner traits when choosing a mate (Arnocky, 2018; Buss & Shackelford, 2008). Accordingly, higher mate-value individuals may be generally less tolerant of deceptions than individuals of lower mate value.

The Present Studies

Online dating has become normative in contemporary culture. Online dating scenarios could provide a novel mechanism for testing adaptive hypotheses about sex differences in mate preferences in strategies. Yet to date, we are unaware of any research examining potential sex differences in how upset men and women would feel when exposed to online dating deception regarding a potential mate's attractiveness, resources, and altruism, three important mate-value characteristics which appear to differ in importance between men and women. In two studies differing

in measurement approach (continuous versus rank-order ratings of upset and willingness to continue dating the deceiver, described further in Study 2), we tested the following hypotheses:

Hypothesis 1 (H1) Male comparison across deception categories: Males will feel most upset and most likely to cancel a date, when the deception surrounds a date's physical attractiveness relative to deceptions about resources (job status) and volunteerism.

Hypothesis 2 (H2) Sex differences in response to physical attractiveness deception: Males will feel more upset and will be more likely to cancel a date, than women when deceived about a date's physical attractiveness.

Hypothesis 3 (H3) Females comparison across deception categories: Females will feel most upset and most likely to cancel the date, when the deception relates to indicators of social status, such as occupation status, compared to other characteristics.

Hypothesis 4 (H4) Sex differences in response to occupation deception: Females will feel most upset and most likely to cancel the date when deceived by employment status than males.

Hypothesis 5 (H5) Sex differences in response to volunteering deception: Females will be most upset and most likely to cancel the date when deceived by cues of altruism, such as volunteering than males.

Hypothesis 6 (H6) The individual difference traits of sociosexual orientation and mate value will moderate the sex differences in the level of distress over the deceptions received by potential mate.

H6a At high levels of sociosexuality, there will be no sex difference in levels of upset due to deceptions of attractiveness and employment (resource acquisition), but there will be a sex difference in levels of upset due to deceptions of volunteering (kindness).

H6b At low levels of sociosexuality, there will be a sex difference in levels of upset due to deceptions of attractiveness and employment (resource acquisition), where females are more upset about resource acquisition and less upset about attractiveness than males. There will be no sex difference in levels of upset due to deceptions of volunteering (kindness) at low sociosexuality.

H6c There will only be a sex difference in all three deceptions type (attractiveness, employment, and volunteering) at high mate value, but not a low mate value.

Study 1

Participants

The sample consisted of 280 heterosexual undergraduate students (123 females) recruited from classrooms and various locations at a university and college campus. The age ranged between 18 and 40 (M_{age} = 21.06, SD = 5.55; 87% Caucasian, 5% African-American, 5% Native, 4% Asian, 2% South East Asian, 1% South Asian, 1% Latin).

Measures and Procedure

Participants completed a survey that included basic demographic information (e.g., sex and age) and self-report measures including the following measures:

Sociosexual Orientation

The participants completed the Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008). The SOI-R measures an individual's restricted (long-term mating strategy) versus nonrestrictive (short-term mating strategy) through three components: past sexual behavior ("with how many different partners have you had sexual intercourse with on one and only one occasion?"), attitudes toward uncommitted sex ("Sex without love is ok."), and desire for uncommitted sex ("How often do you fantasies about having sex with someone you are not in a committed romantic relationship with?"). The SOI-R consists of nine items, with 3 items per component, scored on a 5-point Likert-type scale ranging from 1 = S*trongly disagree* to 5 = *Strongly agree*. Average global sociosexuality scores and component scores were calculated, where a low score indicated a restricted sociosexuality. The SOI-R demonstrated good internal consistency (α = 0.86).

Mate Value

The Mate Value Scale (Edlund & Sagarin, 2014) is a brief scale measuring overall self-perceived mate value. The four-item scale was anchored from 1 = *extremely undesirable/very much lower than average/very bad catch* to 7 = *extremely desirable/very much higher than average/very good catch*. Example items are: "Overall, how would you rate your level of desirability?" and "Overall, how do you believe you compare to other people in desirability as a partner on the

following scale?" In the present study, the Mate Value Scale demonstrated good internal consistency ($\alpha = 0.86$).

Deception

After completing the questionnaire portion of the study, participants read a scenario (see supplementary materials, Appendix A) in which they had just signed up for an online dating website, met someone, and connected instantly. After their online communication, the participants found out the potential mate deceived them about one of three conditions of deception: their date had lied about: (1) his/her attractiveness, (2) his/her occupation, or (3) his/her volunteer work. After reading the scenario, participants were given a forced choice to rank each deception condition from least to most upsetting (1 = *least upsetting* to 3 = *most upsetting*). Although recent research in evolutionary psychology has focused on the role of specific negative emotions in motivating adaptive compensatory actions (e.g., Arnocky et al., 2015a, 2015b; Bird et al., 2016), we adopted the emotional response of "upset" to more broadly capture negative emotionality toward the deception, rather than limiting our assessment to more specific emotion (e.g., anger, betrayal, and frustration), given no a priori predictions about any of these more specific emotions being more or less relevant to the deception scenarios.

Data Analysis

A multivariate analysis (MANOVA) was run to assess the sex difference (male versus female) on how upset each deception type (attractiveness, occupation, and volunteering) made the participant. Furthermore, to test whether mate value and SOI-R moderated the sex on degree of how upset the participant was for each condition, moderator analyses (Model 2) were run using multiple regression in the PROCESS macro for SPSS (Hayes, 2013).

Results

The composite dependent variate was significantly affected by sex, Wilk's $\lambda = .93$, $F(3, 276) = 6.73$, $p < 0.001$, $\eta^2 = 0.068$, indicating a significant MANOVA. Multiple ANOVAs were run on each of the dependent variables (each deception condition). The family-wise error rate to evaluate the three tests was set at 0.01 for each ANOVA using the Bonferroni method for control for Type 1 error. There was a significant difference in the level of upset regarding occupation, $F(1, 278) = 8.43$, $p = .004$, $\eta^2 = 0.03$, where women ($M = 2.02$) were more upset in response to deception involving their prospective date's occupation than men ($M = 1.75$). There was also a significant difference in the level of upset in response to deception involving attractiveness, $F(1, 278) = 18.56$, $p < 0.001$, $\eta^2 = 0.06$, where men ($M = 2.18$), compared to women ($M = 1.76$), were more upset over deception regarding attractiveness. There was no significant sex difference of the level of upset for the volunteering deception, $F(1, 278) = 2.37$, $p < 0.13$, $\eta^2 = 0.008$. See Fig. 1.

A moderator analysis was run for the sex difference in the occupation deception. When examining each of the interaction effects for both moderators, neither the sex by mate-value interaction ($b = -0.003$ $SE = 0.09$ $t = -0.03$ $p = .97$, 95% confidence intervals: LL = −0.18, UL = 0.18) nor the sex by SOI-R interaction ($b = -0.19$ $SE = 0.12$ $t = -1.55$ $p = .12$, 95% confidence intervals: LL = −0.44, UL = 0.05) was significant.

Next, a moderator analysis was run to assess the sex difference in the attractiveness deception. When examining each of the interaction effects for both moderators, neither the sex by mate-value interaction ($b = 0.01$ SE = 0.10 $t = 0.13$ $p = .9$, 95% confidence intervals: LL = −0.18, UL = 0.21) nor the sex by SOI-R interaction ($b = 0.20$ SE = 0.13 $t = 1.52$ $p = .13$, 95% confidence intervals: LL = −0.06, UL = 0.45) was significant.

Lastly, a moderator analysis for the sex difference in the volunteer deception was analyzed. When examining each of the interaction effects for both moderators, neither the sex by mate-value interaction ($b = -0.01$ SE = 0.10 $t = -0.11$ $p = .9$, 95% confidence intervals: LL = −0.21, UL = 0.19) nor the sex by SOI-R interaction ($b = -0.006$ SE = 0.14 $t = -0.05$ $p = .96$, 95% confidence intervals: LL = −0.28, UL = 0.26) was significant. Results suggest clear sex difference in how upset the participants were for the attractiveness and occupation deceptions, regardless of the individual differences in their self-perceived mate value and sociosexuality.

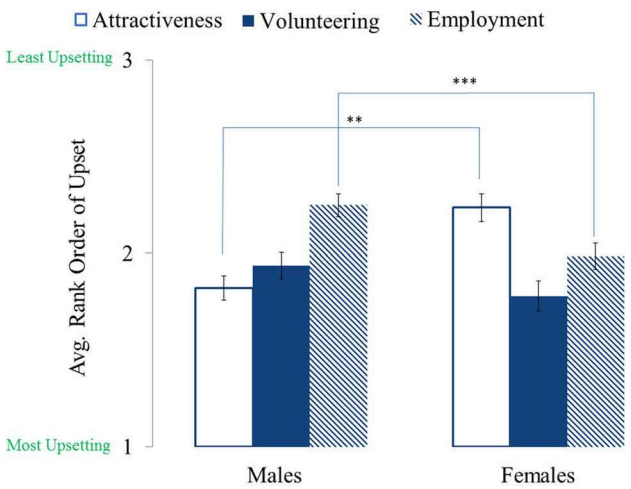

Fig. 1 Sex differences in the rank ordering of how upset participants reported they would feel after experiencing each form of deception, from 1 = Most Upsetting to 3 = Least Upsetting. $^{**}p < .01$, $^{***}p < .001$

Study 2

Previous literature examining sex differences in reported emotional responses to various reproductive challenges has identified potential measurement biases that might influence observed results. For example, regarding sex differences in response to jealousy, Zengel, Edlund, and Sagarin (2013) found that when examining a continuous response scale for jealousy, there was no interaction effect of sex by type of infidelity (sexual versus emotional). However, when examining a forced-choice measure of jealousy, there was a sex difference, whereby males were more likely to be upset about sexual infidelity, whereas females were more upset about emotional infidelity (see also Harris, 2002; Tagler, 2010). This body of literature demonstrates that potentially when examining the sex difference in responses due to deceptions through continuous measure, we may not see the same effect. The second study is designed to replicate study 1 through difference measurements.

Participants

Participants were 364 undergraduate students (188 females) from the same university as the first study. The age ranged from 18 to 40 years old ($M_{age} = 21.6$, $SD = 5.06$; 91% Caucasian, 5% Native, 4% African-American, 3% Asian, 2% South Asian, 1% Latin, 0.5% Arab, 0.3% South East Asian). All procedures were approved by the university research ethics board.

Measures and Procedure

Participants completed a survey that included basic demographic information (e.g., sex and age) and self-report measures including the following measures:

Mate Value and Sociosexuality

Following Study 1, self-report questionnaires on mate value and sociosexuality were assessed using MVS (Edlund & Sagarin, 2014) and SOI-R (Penke & Asendorpf, 2008), respectively.

Deception

After completing the questionnaire portion, participants read the same hypothetical scenario as in Study 1; however, instead of the three conditions being presented and a forced-choice response, participants were randomly represented one of three conditions (i.e., attractiveness, employment, or volunteering deceptions). After reading the scenario (see supplementary materials, Appendixes B, C, and D), participants were asked two (continuous) follow-up questions. "How upset would this dishonesty make you?" was anchored from 1 = *not at all upset* to 7 = *very upset.* "How likely would you be to cancel your date?" was anchored from 1 = *I would cancel* to 7 = *I would cancel the date*.

Data Analysis

Two-way ANOVAs were used to assess the interacting effect of sex (male versus female) and deception types (attractiveness, occupation, and volunteering) on attitudinal (how upset the participant was about the deception) and behavioral (how likely the participant was to cancel the date) outcome measures. Furthermore, to test whether mate value and SOI-R moderated the sex and condition differences in participants' level of upset about the dishonesty or their likelihood of canceling the date, four moderator analyses (Model 2) were run using multiple regression in the PROCESS macro for SPSS (Hayes, 2013).

Results

How Upset Would this Dishonesty Make You?

First, the degree of how upset the individual was about the deception was analyzed. There was no significant interaction between sex and deception type, $F(1, 353) = 0.76$, $p = .47$, $\eta^2 = 0.004$, nor a main effect of condition $F(1, 353) = 0.59$, $p = .55$, $\eta^2 = 0.003$. There was a trend toward a main effect of sex, $F(1, 353) = 3.61$, $p = .058$, $\eta^2 = 0.01$, where men ($M = 3.44$) were more upset than women ($M = 3.20$) about the dishonesty in general.

Second, a moderator analysis was run to analyze if mate value and SOI-R moderated the sex and condition differences in the participants' degree of feeling upset about the deception. When examining mate value and SOI-R's ability to moderate the condition difference in the level of upset, neither the mate value by condition ($b = 0.14$ SE = 0.1 $t = 1.33$ $p = .19$, 95% confidence intervals: LL = − 0.07, UL = 0.34) nor the SOI-R by condition interactions was significant ($b = 0.11$ SE = 0.11 $t = 1.01$ $p = .32$, 95% confidence intervals: LL = − 0.11, UL = 0.33). When examining mate value and SOI-R's ability to moderate the sex difference in the level of upset, neither of the interactions were significant: sex by mate value ($b = -0.11$ SE = 0.17 $t = -0.64$ $p = .53$, 95% confidence intervals: LL = − 0.44, UL = 0.22) and sex by SOI-R ($b = 0.2$ SE = 0.18 $t = 1.11$ $p = .27$, 95% confidence intervals: LL = − 0.16, UL = 0.56).

How Likely Would You Cancel the Date?

A two-way ANOVA was used to analyze the effects of sex and deception condition on the likelihood of canceling the date. There was a significant interaction between sex and type of dishonesty, $F(2, 353) = 5.79$, $p = .003$, $\eta^2 = 0.03$. Further post hoc analyses were run to analyze the significant interaction through L-Matrices. Within the attractiveness condition, there were no significant sex differences in how likely they were to cancel the date, $F(1, 353) = 0.01$ $p = .92$, $\eta^2 < 0.001$. Within the volunteering condition, women ($M = 4.97$) were significantly more likely to cancel the date than men ($M = 3.37$), $F(1, 353) = 23.44$, $p < 0.001$, $\eta^2 = 0.06$. Women were also more likely to cancel the date ($M = 3.85$) than men ($M = 3.02$) if the potential mate lied about their occupation, $F(1, 353) = 6.21$, $p = .01$, $\eta^2 = 0.02$. See Fig. 2. Among men, there were significant differences in how likely participants were to cancel the date between each condition $F(2, 353) = 6.35$, $p = .002$, $\eta^2 = 0.04$. Analyses of simple main effect were conducted to evaluate the three pairwise comparisons among the means for the male participants, with an alpha set at 0.05 to control for Type I error using the Holm's sequential Bonferroni. Men were more likely to cancel the date when deceived about their prospective date's attractiveness ($M = 4.17$) than their volunteerism and occupation ($M = 3.37$, and $M = 3.02$, respectively). The different conditions also affected the likelihood of women canceling their prospective date $F(2, 353) = 6.18$, $p = .002$, $\eta^2 = 0.03$. After controlling for Type I error using the Holm's sequential Bonferroni with an alpha set at 0.05, women were more likely to cancel their date when deceived about their future date's volunteerism ($M = 4.97$) than either their attractiveness ($M = 4.21$) or occupation ($M = 3.85$).

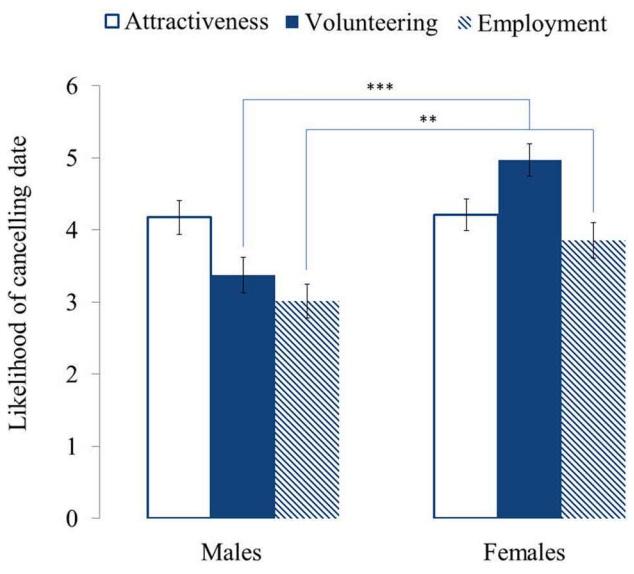

Fig. 2 Sex differences in the likelihood that participants would cancel the date after experiencing each form of deception. $^{**}p < .01$, $^{***}p < .001$

Moderator analysis to examine the ability of mate value and SOI-R to moderate the sex and condition differences in participants' likelihood of canceling the date. When examining the interactions for each of the moderators, none of the interaction were significant: mate value by condition ($b = -0.25$ SE = 0.14 $t = -1.85$ $p = .06$, 95% confidence intervals: LL = −5.2, UL = 0.02), SOI-R by condition ($b = -0.19$ SE = 0.14 $t = -1.34$ $p = .018$, 95% confidence intervals: LL = −0.47, UL = 0.09), sex by mate value ($b = -0.007$ SE = 0.22 $t = -0.03$ $p = .97$, 95% confidence intervals: LL = −0.44, UL = 0.43) nor sex x SOI-R ($b = -0.14$ SE = 0.24 $t = -0.6$ $p = .55$, 95% confidence intervals: LL = −0.62, UL = 0.33).

Results suggest clear sex differences in participants' willingness to cancel a date based upon the type of deception experienced regardless of individual differences in sociosexual orientation or own mate value, such that women were more likely than men to cancel the date when confronted with male deception about job status or volunteerism.

General Discussion

Even though both men and women believe it is unacceptable to lie in an online dating profile, 81% of online dating users have admitted to deceiving on their profile information (Toma et al., 2008). Multiple previous research studies have identified who are the type of people who are deceiving their self-presentation online, but there is a limited amount of research focused on how these deceptions would be received. The purpose of this study was to examine the sex differences in response to being lied to in an online dating context. Through the use of surveys and an online dating scenario, we discovered these sex differences do exist.

In Study 1, by using a force-choice question the sex differences in each deception type were examined. Men were most upset when deceived about attractiveness compared to women, supporting *H2*. Women were more upset than men when lied to about their prospective date's occupation, supporting *H4*. These findings are reflective of mate preferences of men and women. Since men value attractiveness and women value status (Buss, 1989), men being most upset regarding deceived attractiveness and women being most upset regarding deceived occupation suggest deception regarding these mate preferences is most upsetting. *H5* was no supported, such that there was very little difference in the level of upset between men and women in response to deception pertaining to volunteerism, which suggests men and women are equally upset about deception concerning altruistic tendencies. This finding falls within the unclear sex difference in the preference for altruism as a mate-value

characteristic viewed in the previous literature. We hypothesize this sex difference is lost due to the force-choice question pulling apart the sex differences in the other characteristics, which leaves the altruistic mating preference the least important trait.

In Study 2, participants were randomly assigned to deception type conditions, and they were asked to answer continuous items about being upset about the deception and their likelihood of canceling the date. Men were most likely to cancel their prospective date when lied to about attractiveness rather than employment or volunteerism, supporting *H1*. This could reflect men's preferences for a youthful and attractive partner (Buss, 1989), and since these characteristics are important to men in terms of mating, being lied to about these traits could be most upsetting. However, *H2* was not supported, such that there was no sex difference in the likelihood of canceling the date due to the attractiveness deception. The fact that both sexes were equally likely to cancel the date due to attractiveness deception could reflect women's preferences for partner attractiveness potentially being higher in a university dating population. For example, Mucci and Mason (2015) found no sex difference in the degree to which young women and men rated the importance of a partner's attractiveness, with both sexes viewing this trait as highly important (> 4 out of 5). Yet some evidence shows that women may "trade-off" a partner's attractiveness to satisfy other mating goals, such as access to resources (Waynforth, 2001). Moreover, although previous research has shown congruence between individuals in their ratings of others' attractiveness, males appear to demonstrate stronger consensus regarding which traits contribute to female physical attractiveness, whereas there is more variability among females (Wood & Brumbaugh, 2009). It is possible that women more than men conflate other facets of men's mate value with attractiveness, which might influence subsequent reactions to deception on this dimension. Together, this may help to explain the differences observed between the forced choice versus continuous measurement models employed across the two studies. In Study 1, a sex difference in attractiveness was observed when individuals had to rank their degree of upset over attractiveness deception while considering deception surrounding other important mate-value dimensions, whereas in the continuous measurement study, participants were only given one deception category and were asked to rate their upset and willingness to cancel the date on a continuum. With no other restrictions on their ratings, women may prioritize attractiveness equally with men or they may be using other characteristics aligned with physical attractiveness to make their response (e.g., that the date is generally untrustworthy or undesirable for long-term mating). Prioritizing attractiveness aligns with research on mate preference trade-offs whereby invoking a more restrictive mating budget enhances sex differences in the prioritization of resources by women at the expense of attractiveness (e.g., Li, Kenrick, Bailey, & Linsenmeier, 2002; Waynforth, 2001). Interestingly, Li et al. also demonstrated that both sexes appear to prioritize kindness. To the extent that volunteerism signals (among other things) kindness, this may explain that lack of sex difference in upset over volunteerism deception in our forced-choice paradigm.

H3 was also not supported because women were most likely to cancel the date in response to deception regarding their prospective date's volunteerism, and not occupation like we anticipated. We speculate this could be because women may have placed greater emphasis on their prospective date's altruistic tendencies, reflected in volunteer habits, in terms of what women find to be most upsetting when lied to. In a university setting, it may be difficult for women to envision occupation deception, given that most of their real dating experiences likely involve other students who are not yet in the workforce. Future research might utilize samples of young working professionals or alter the deception scenario to focus on expected average incomes of specific college majors or career goals of the deceiver. *H4* and *H5* were both supported, such that women were more likely to cancel the date than men over both volunteering and employment deceptions.

Interestingly, *H6* was not supported in either Study 1 or 2. Neither mate value nor sociosexual orientation moderated the sex differences in the level of upset felt due to the deceptions, or the likelihood of canceling the date. This finding supports the idea that these core sex differences in mating preferences may be unaffected by individual differences in both self-perceived mate value and their mating strategies (i.e., long-term versus short-term mating). This appears to contrast with established findings that men and women of higher mate value hold more stringent mate preferences across dimensions of attractiveness, kindness, and resources (e.g., Arnocky, 2018; Buss & Shackelford, 2008) and that individual differences in sociosexual orientation relate to divergent preferences for attractiveness and kindness (Simpson & Gangestad, 1992). Recent research has shown that self-perceived mate value and third-party ratings of mate value in women may not be a predictor of preferences for more attractive masculine faces (Clarkson et al., 2020; Docherty, Lee, Hahn, DeBruine, & Jones, 2020), supporting our findings of mate value's lack of moderation effect on the sex difference in deception. Similar findings have been shown for sociosexuality, where there was little effect of women's self-perceived sociosexuality on preferences for attractive masculine faces (Stower et al., 2020). Another possible explanation for why there was a lack of moderation effect for both mate value and sociosexuality in the current study is that we may have lacked the variability in our outcome measures due to the assignment of only one deception scenario to each participant. Future research might consider assigning a counterbalanced

outcome measure where participants are presented with each type of deception and are asked to respond on a continuous measure rating their degree of upset and likelihood of canceling the date for each. Future research might also consider using a more heterogeneous sample by including community members to potentially increase variability in responses to all measures.

Limitations

Although this study produced multiple significant results, it is not without limitations. Our sample consists of a WEIRD population, which decreases the potential for generalizability (Henrich, Heine, & Norenzayan, 2010). Further, our sample was focused on a young demographic, with a mean age for both studies being approximately 21 years old, which cannot define the results of an older population. Past research has demonstrated younger adults have a more self-focused presentation when it comes to their online dating profiles, while older adults used fewer self-referencing words, but rather used words relating to social connectedness (Davis & Fingerman, 2015). Future research could examine different populations in terms of their online dating use.

Another limitation is in our dating scenario. We did not indicate on which online dating platform the participant met their prospective date. In this case, the participant, in imagining the scenario, would infer their own choice of online dating platform. This could be problematic because individual difference characteristics, such as sociosexuality, have recently been shown to differ across online dating platforms (Holler, Shepard, & Welling, 2019). For example, individuals who were using the online dating application Zoosk were more restricted in their sociosexuality than those using Tinder and OKCupid (Holler et al., 2019). However, as shown in this study, the individuals' sociosexuality did not moderate the current findings.

Additionally, the dating scenario employed in research was hypothetical. Such hypothetical responses are common in social psychology ranging across difficult to measure topics such as aggression (Arnocky, Ribout, Mirza, & Knack, 2014) and mating preferences/decision making (e.g., Li et al., 2002). One drawback of such scenarios is that individuals may believe they would respond in one manner but might actually behave differently when faced with the scenario in the natural environment (Pager & Quillian, 2005). Future research should consider examining real scenarios of dating deceptions on online dating before making firm conclusion about extant sex differences in response to such deceptions. For example, researchers could ask participants whether they have had experiences with each form of deception, and how upset it made them. Experimental speed dating paradigms could perhaps be implemented by providing a biography of each participant prior to interactions, with a confederate engaging in deception along one of the target dimensions. Researchers could subsequently measure both level of upset and willingness to date the individual again to glean more naturalistic information.

Conclusion

This study is one of the first to examine responses to deception in an online dating context and the first to our knowledge to examine sex differences in the level of upset in response to deception in online dating. Succumbing to deception in these areas of mate preference prioritization would have negatively impacted ancestors' reproductive success. Accordingly, humans may have evolved sex differences in negative emotionality surrounding different forms of areas of deception surrounding a potential mate's value. This study shows that mate preferences are still relevant in the modern context of online dating and sex differences are still implicated in these mate preferences. Results from this study provide a framework for future research in online dating and responses to deception in a modern online dating context.

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Compliance with ethical standards

Conflict of interest All authors declare that they have no conflcit of interest.

Ethical approval All procedures were approved by the university research ethics board.

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