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# Who perceives sexual harassment? Sex differences and the impact of mate value, sex of perpetrator, and sex of target<sup> $\star$ </sup>



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#### ABSTRACT

The #MeToo movement has drawn attention to sexual harassment in the workplace. Using an adaptationist approach, two studies were designed to investigate sex differences in perceptions of a sexually ambiguous comment and individual differences that may explain variation in those perceptions. Study 1 (n = 179) was a within-subjects study to investigate whether there is a sex difference in perceptions of sexual harassment and whether sex of speaker/target influences these perceptions. We found women were more likely than men to perceive the comment as sexual harassment when the speaker was a woman. However, for men and women, the comment was more likely to be perceived as sexual harassment, insulting, intentional, and less funny when the speaker was a man and the target was a woman. Study 2 (n = 742) was a between-subject study examining the effect of individual differences on perceptions of sexual harassment. We found, beyond sex differences and sex of speaker/target, one's own self-perceived mate value predicted perceptions of sexual harassment while socio-sexuality did not. These findings suggest men and women perceive sexually ambiguous situations differently and that sex of the perpetrator/target as well as one's own mate value influences those perceptions.

#### 1. Introduction

The #MeToo movement has renewed scientific and cultural attention to the issue of sexual harassment. In the United States, sexual harassment is defined as sex discrimination consisting of two main forms (Browne, 1997, 2006). The first is known as quid pro quo harassment in which a subordinate is required to acquiesce to sexual advantages to obtain workplace benefits (e.g., promotion) or avoid costs (e.g., being fired). The second is what is commonly referred to as *hostile environment* harassment, where an employee experiences a work environment that is overly sexual in such a way as to be pervasively unwelcome and insulting, thus creating a hostile workplace. Such experiences could include sexual advances (without clear rewards or costs) or a generally sexualized atmosphere (e.g., sexual photographs or sharing of sexual jokes) where an individual may be targeted or not. Relatively recent attempts to assess the frequency of such experiences, suggest it varies across settings, with some studies reporting as many as 60–80% of female employees have experienced some form of sexual harassment (Buchanan, Settles, Wu, & Hayashino, 2018; Mathews et al., 2019; Pitot et al., 2021). However, not all studies report such high rates and the rates of charges or lawsuits are also much lower than some survey studies indicate (EEOC, 2020). While there are a number of possible reasons for women to not file complaints (from retaliation concerns to it not being seen as worth the trouble), it may be that there are also individual differences in how certain behaviors are perceived, not just between men and women but within sex, and that some studies may be oversampling those more likely to interpret actions in a negative light. In addition, men and women may perceive the same behavior rather differently. Which, of course, raises the question of how the various types of behaviors that fall into the category of sexual harassment are perceived by men and women as well as whether all men and all women see them in the same light.

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### 1.1. Perceptions of sexual invitations may be reflections of sex differences in sexual strategies

From an adaptationist perspective, selection favors traits that enhance an organism's ability to survive and reproduce. While many problems faced by men and women are the same (e.g., obtaining food, water, shelter), in the mating domain the problems they face differ in meaningful ways. This creates sex differences that are not only physical but also psychological, especially those highlighted by sexual strategies theory (Buss & Schmitt, 1993, 2019).

Sexual strategies theory predicts the development of sex-specific strategies related to parental investment. According to parental investment theory, obligatory male investment in offspring requires a small amount of time and the sharing of gametes, even though most men over time invest a great deal more time, attention, and provisioning toward the mother and offspring (Trivers, 1972). As a result, one would expect men to display a great deal of interest in mating opportunities given that more successful matings will have led to improved reproductive success over generations. The situation for female mammals is quite different. Women experience far more substantial obligatory investment involving gametes, gestation, lactation, and post-partum childcare, because of the importance of maternal care to infant and child survival (Hrdy, 1999; Keller & Chasiotis, 2007). The result of these different problems in maximizing fitness would suggest that women should be especially concerned with seeking quality mates who will invest in the raising of children, in addition to investing in a long-term committed relationship as a conduit for providing paternal care and resources (Buss, 1994; Thomas & Stewart-Williams, 2018; Thornhill & Gangestad, 2008). Of course, the fact that women prefer committed, invested, quality mates indicates that men do engage in long-term mating, despite their interest in short-term opportunities (Buss & Schmitt, 1993; Salmon, 2017). Sexual strategy theory, which builds on parental investment theory, emphasizes that human mating psychology includes between-sex as well as within-sex differences, particularly regarding long-term and shortterm mating psychology (Schmitt, Shackelford, & Buss, 2001).

Such sexual strategies might be relevant to sexual harassment and sexual invitations in the workplace in that sex differences in sexual strategies appear to have led to sex differences in how men and women perceive sexual interest in interpersonal contexts (Li, Sng, & Jonason, 2012). Error management theory suggests that biases in the perception of sexual interest are shaped by fitness costs and benefits (Haselton, 2003; Haselton & Buss, 2000). This can happen in two types of uncertain circumstances. In one, friendliness can be perceived as sexual interest (i. e., sexual overperception bias, a false positive). In the other, one can perceive sexual advances as friendliness (i.e., underperception bias, false negative). It has been suggested that men are more likely to experience the overperception bias because of the fitness benefits that accrued to men who took advantage of short-term sexual opportunities that came their way. There is a fitness benefit to the perception of sexual interest, even if it sometimes is in error. As a result, men not only initiate more sexual invitations, but they also are more likely to overestimate the sexual interest women have in them (Grontvedt et al., 2015). As women do not generally accrue the same fitness benefits from short-term mating, they underperceive interest, show commitment skepticism bias, and are generally more selective when it comes to sexual offers (Cyrus, Schwarz, & Hassebrauck, 2011; Haselton & Buss, 2000). Thus, sexual advances are more likely to be perceived as a reproductive opportunity to men and a reproductive cost to women (Browne, 2006). As a result, men and women interpret behavior differently with some studies suggesting men believe their actions to be flattering (and desirable if directed toward themselves) whereas women may see the same behavior as undesirable (Rotundo, Nguyen, & Sackett, 2001; Russell & Trigg, 2004).

Evolutionary-minded researchers have examined the influence of sexual strategies on perceptions of sexual intent and harassment. In studies where participants evaluate hypothetical scenarios of workplace sexual advances, men perceive sexual advances less negatively than women (Klümper & Schwarz, 2020), viewing them more as an opportunity than a cost. A similar pattern can be seen in studies assessing perceptions of one's own experiences of sexual invitations (Dyer et al., 2019; Otterbach, Sousa-Poza, & Zhang, 2021). Studies examining sex differences in perceptions that have varied the sex composition of the dyad (target being a man, a woman, or unspecified) report that women were less tolerant of sexual harassment and more likely to perceive a wider range of behaviors or situations as constituting sexual harassment than men (Rothgerber, Kaufling, Incorvati, Andrew, & Farmer, 2021; Shechory Bitton & Ben Shaul, 2013). Interestingly, a recent study has suggested that the more "prototypical" the female target (i.e., more attractive face, more desirable, the more likely harassment will be recognized by men and women (Goh, Bandt-Law, Cheek, Sinclair, & Kaiser, 2021). In that line of research, "prototypical" feminine features have been defined in terms of both physical features (e.g., attractive face, hourglass body shape) and psychological traits (e.g., being gentle, caring; Goh et al., 2021; Helgeson, 1994; Prentice & Carranza, 2002).

## 1.2. Individual differences that may influence perceptions of sexual harassment

In addition to sex differences in perceptions, there are several individual differences likely to play a role in perceptions of sexual harassment. One such factor is sociosexuality, a measure of different mating strategies not only between but within sex. The sociosexuality dimension ranges from restricted to unrestricted where restricted is more reflective of a long-term approach to mating and unrestricted to a shortterm mating orientation. Unrestricted individuals will be more likely to report interest in a greater number of partners and less need for love and attachment before consenting to sex. While sociosexuality tends to show sex differences with men, on average, scoring higher than women, there is within-sex variation as well (Buss, 2006; Salmon, 2015) that reflects different sexual interests and attitudes. Some research has shown that sexually unrestricted individuals perceive more sexual interest (Kohl & Robertson, 2014; Penke & Asendorpf, 2008) and that sexually unrestricted men show strong evidence of the sexual overperception bias mentioned previously (Perilloux, Easton, & Buss, 2012). Studies that have tested the influence of sociosexuality on perceptions of sexual harassment have indicated that greater sociosexuality scores are associated with more positive perceptions of sexual overtures and when manifested in actual behavior are an outcome of high levels of interest in the solicitation of short-term sex (Bendixen & Kennair, 2017; Kennair & Bendixen, 2012; Klümper & Schwarz, 2020).

Another individual difference likely to be relevant to assessments of sexual harassment is mate value. Several studies have assessed the impact of target or "perpetrator" in sexual intent or harassment scenarios with advances from an attractive or high-status actor perceived as less offensive than advances from an unattractive actor (Klümper & Schwarz, 2020) and that when the target is perceived as less prototypically feminine, they are perceived to be less likely targets (Goh et al., 2021). However, the influence of individuals' self-assessed mate value on their own perceptions of sexual harassment has not been assessed in most studies. Mate value can be defined as an individual's desirability to members of the opposite sex. Several variables are relevant to mate value. For men, some major aspects are resource availability and status, physical attractiveness, and masculinity (Buss, 2006). Several studies have suggested that self-assessed mate value can influence the overperception bias such that men who perceive themselves as high in mate value may be more likely to overperceive female sexual interest (Kohl & Robertson, 2014; Perilloux et al., 2012). Such men may be more likely to create situations they perceive as opportunities and women may perceive as costs. As a result, high mate value (as opposed to low mate value) men may generally perceive less sexual harassment than women. In addition to the question of the influence of men's own mate value on perceptions, an unanswered question is whether women's mate value

influences their perceptions of sexual intent or harassment.

#### 1.3. Current studies

In the current studies, we examine factors that influence whether a sexually ambiguous comment is perceived to be sexual harassment, an insult, or funny. Does the sex of the speaker and target influence these perceptions? Do individual differences in self-perceived mate value and one's own openness to casual sex influence how the comment is perceived? Do these same factors also influence perceptions of intent (i. e., whether the speaker intended to sexually harass the target)? To isolate the potential effect of sex of perpetrator/target on these different perceptions, a minimal pair design methodology was used for both studies in that the only factor that varied was whether the sexually ambiguous comment was made by a man to a female colleague or by a woman to a male colleague. This controls for other factors that may influence perceptions of sexual harassment, including the relative status of the perpetrator/target, if the potential harassment is not the first offense, and whether the potential harassment was personally directed at the target or a more generally made comment (Kessler et al., 2020). These factors have been associated with perceptions of sexual harassment (Kessler et al., 2020). Therefore, those factors were important to control for in the current studies. This was done by holding the relative status of speaker/target constant by explicitly referring to the speaker/ target as equal status peers, and by leaving other factors out of the description to investigate how ambiguous situations in the workplace are perceived.

#### 2. Study 1

Study 1 used a within-subjects design to test whether (i) there is a sex difference in perceptions of sexual harassment; and (ii) whether the sex of the speaker/target influences perceptions of sexual harassment. The following predictions were tested:

Prediction 1: There will be a sex difference in perceptions of sexual harassment such that women will be more likely to perceive harassment, insult, and intent to harass than men. Women will also be less likely than men to report that the target would find the comment funny.

Prediction 2: There will be a difference in perceptions of sexual harassment as a function of the sex of perpetrator/target such that men will be more likely to be perceived as engaging in sexual harassment and intending to sexually harass the target than women. As such, female targets will be perceived as being more insulted and finding the comment less funny than the male targets.

#### 2.1. Method

#### 2.1.1. Participants

The sample was composed of 179 undergraduate students (125 women, 54 men) recruited from introductory psychology courses at a private university in the southwestern USA who completed an online survey for course credit. Participants' ages ranged from 17 to 28 (M = 18.83, SD = 1.48). Approximately 48% of participants self-reported their ethnicity as being Caucasian, 32% Hispanic or Latina/o, 5% African American, 5% Asian, 3% Native American, 2% Middle Eastern, 1% Pacific Islander, and 5% "other."

#### 2.1.2. Measures

2.1.2.1. Demographics. Participants were asked to self-report their age, biological sex assigned at birth (*male, female, or intersex*), and their ethnicity.

2.1.2.2. Perceptions of sexual harassment. Perceptions of sexual harassment were measured using two short vignettes in which two individuals

(i.e., Diane and Jason) were described to have worked together, as managers for the same company, for more than two years and to occasionally socialize after work with several colleagues (see Reynolds et al., 2020). One day, during a lunch break at a professional conference, one of them drops their fork and bends over to get it. As they straighten up, the other person says to them, "You must get a lot of practice doing that." The only difference between the two vignettes was whether Jason drops the fork and Diane makes the comment; or whether Diane drops the fork and Jason makes the comment. For each vignette, participants were asked to indicate whether (i) the comment should be considered sexual harassment; (ii) the target would feel insulted by the comment; (iii) the speaker intended to sexually harass the target; and (iv) the target would consider the comment funny by selecting either *yes* or *no* to each of those items. For analyses, *yes* responses were coded as '1' and *no* responses were coded as '0.'

#### 2.1.3. Procedure

Participants were sent a link to complete an online survey. Participants first responded to the demographic questions, followed by the perceptions of sexual harassment questions for each vignette (presented one at a time). To control for a potential order effect, participants were randomly assigned to receive either the vignette in which Jason drops a fork and Diane makes the comment first, or the vignette in which Diane drops a fork and Jason makes the comment first. After completion of the survey, participants were compensated for their time.

All procedures and measures were approved by the first four authors' university's Institutional Review Board (IRB). Participants gave full informed consent before participating in the study, and no deception was used. Parental consent was received for participants under the age of 18.

#### 2.2. Results

#### 2.2.1. Testing for sex differences in perceptions

All statistical analyses were conducted using IBM SPSS (Version 28). The percentages of men and women who endorsed 'yes' the comment was intended to sexually harass the target, the target would consider the comment funny, the target would be insulted, and the comment should be considered sexual harassment are reported in Table 1. Chi-square analyses revealed no sex difference in perceptions of intent, humor, or insult. Women were, however, found to be 1.72 times more likely to consider the comment to be sexual harassment than men. Further investigation of sex differences in perceptions as a function of who made the comment (see Table 1) revealed this sex difference between men and women in any of the perceptions when Jason was the speaker (i.e.,

#### Table 1

Percentages of men and women who endorsed 'yes' for perceptions of intent, humor, insult, and sexual harassment reported overall as well as a function of who made the comment (Jason vs. Diane).

Measure	Men	Women	$\chi^2$
Intent	13.9%	15.2%	0.10
Jason	13.0%	11.2%	0.11
Diane	14.8%	19.2%	0.49
Funny	37%	33.2%	0.49
Jason	18.5%	12.8%	0.99
Diane	55.6%	53.6%	0.06
Insult	63%	67.2%	0.60
Jason	81.5%	88.8%	1.74
Diane	44.4%	45.6%	0.02
Sexual harassment	70.4%	80.4%	4.33*
			(OR = 1.72)
Jason	81.5%	85.6%	0.49
Diane	59.3%	75.2%	4.60*
			(OR = 2.08)

\* p < .05.

potential perpetrator). When Diane was the speaker, however, more women reported the comment should be considered sexual harassment than men. The odds ratio indicates women were 2.08 times as likely as men to endorse '*yes*' the comment was sexual harassment when Diane was the potential perpetrator.

#### 2.2.2. Testing for effect of sex of speaker/target

McNemar change tests were used to test whether there was a difference in perceptions (within subjects) as a function of vignette (i.e., whether Jason or Diane made the comment). This analysis indicated there was a difference in perceptions of whether (i) the comment should be considered sexual harassment ( $\chi^2 = 21.33$ , p < .001, OR = 0.04); (ii) the target would feel insulted ( $\chi^2 = 64.99, p < .001, OR = 0.05$ ); (iii) the speaker intended to sexually harass the target ( $\chi^2 = 4.00, p = .04, OR =$ 2.57); and (iv) the target would consider the comment funny ( $\chi^2$  = 60.49, p < .001, OR = 15.20) as a function of whether Jason or Diane made the comment. As can be seen in Fig. 1, a greater proportion of participants perceived the comment to be sexual harassment when Jason made the comment; a greater proportion of participants perceived Diane would be insulted when Jason made the comment; a greater proportion perceived that Diane intended to sexually harass Jason when she made the comment; and a much greater proportion perceived that Jason would consider the comment funny when Diane made it. The odds ratios indicate the largest effects were for perceptions of humor and intent. Although participants were 2.57 times more likely to perceive intent when Diane was the speaker, they were also 15.2 times more likely to perceive humor when she was the one making the comment.

#### 3. Study 2

Study 2 used a between-subjects design to examine the effect of individual difference factors on perceptions of sexual harassment in addition to the factors investigated in Study 1. Specifically, Study 2 was designed to test whether one's own self-perceived mate value and sociosexuality influences perceptions of sexual harassment beyond what can be explained by sex differences and sex of the speaker/target. Mate value was assessed in terms of self-perceived attractiveness as a longterm mate, a short-term mate, as well as self-perceived general unattractiveness as a mate. Sociosexuality was assessed in terms of individuals' attitudes, desire, and engagement in casual sexual behavior. The following predictions were tested:

Prediction 1: There will be a sex difference in perceptions of sexual harassment such that women will be more likely to perceive harassment, insult, and intent to harass than men. Due to greater perceptions of harassment, women will also be less likely to report that the target would consider the comment funny.

Prediction 2: There will be a difference in perceptions of sexual



**Fig. 1.** Percentage of Study 1 participants who endorsed 'yes' the comment should be considered sexual harassment, the target would feel insulted by the comment, the speaker intended to sexually harass the target, and the target would consider the comment funny as a function of who made the comment (Jason vs. Diane) with standard error bars.

harassment as a function of the sex of perpetrator/target such that men will be more likely to be perceived as engaging in sexual harassment and intending to sexually harass the target than women. As such, female targets will be perceived as being more insulted and finding the comment less funny than the male targets.

Prediction 3: Individuals who have higher self-perceived mate value as a long-term mate and those with higher self-perceived general unattractiveness as a mate will perceive more sexual harassment, insult, and intent to harass; while those who have higher self-perceived mate value as a short-term mate will perceive less sexual harassment, insult, and intent to harass. As such, perceptions of whether the target would consider the comment funny would decrease with higher self-perceived general unattractiveness as a mate and increase with higher selfperceived mate value as a short-term mate. This prediction was based on assumptions that those who perceive themselves to be highly attractive for long-term relationships as well as those who perceive themselves to be generally unattractive as a long or short-term mate would be less likely to see short-term sexual opportunities in a positive light and/or as something they could take advantage of.

Prediction 4: Individuals with more restricted sociosexuality will perceive more sexual harassment, insult, and intent to harass; while those with higher sociosexuality will perceive less sexual harassment, insult, and intent to harass. As such, perceptions of whether the target would consider the comment funny would increase as individuals' sociosexuality increased.

#### 3.1. Method

#### 3.1.1. Participants

Participants were 742 adults (433 women, 309 men) between the ages of 17 and 76 (M = 30.0, SD = 13.57). Undergraduate students (n = 336; 227 women, 109 men; age range 17–26, M = 18.78, SD = 1.14) were recruited from introductory psychology courses at a private university in the southwestern USA and received course credit for their participation. To extend the sample beyond that of the typical college undergraduate, participants were also recruited through Amazon M-Turk (n = 406; 206 women, 200 men; age range 19–76, M = 39.26, SD = 12.05) and received \$2 (USD) in compensation for their participation. Overall, approximately 55% of participants self-reported their ethnicity as African American, 20% Caucasian, 10% Hispanic or Latina/o, 9% Asian, 1% Middle Eastern, 1% Native American, <1% South Asian, and 4% "other." Approximately 83% of participants self-reported being exclusively heterosexual, 14% bisexual, and 4% exclusively homosexual.

#### 3.1.2. Measures

3.1.2.1. Demographics. In addition to the demographics collected in study 1, participants were asked to self-report their sexual orientation (exclusively heterosexual, bisexual, exclusively homosexual, or asexual).

3.1.2.2. Perceptions of sexual harassment. Perceptions of sexual harassment were measured using the same two vignettes from Study 1 (see Reynolds et al., 2020). Instead of using yes/no responses, however, participants were asked to indicate their level of agreement (1 = strongly disagree, 7 = strongly agree) with the items (i) the comment should be considered sexual harassment; (ii) the target would feel insulted by the comment; (iii) the speaker intended to sexually harass the target; and (iv) the target would consider the comment funny.

3.1.2.3. Sociosexuality. Sociosexuality was measured using the revised Sociosexuality Inventory (SOI-R; Penke & Asendorpf, 2008). The SOI-R consists of nine items on 9-point Likert scales with three items measuring casual sexual behavior (from 0 to 20 or more), three items measuring attitudes toward casual sex (from strongly disagree to strongly

agree), and three items measuring desires for casual sex (from never to at least once a day). Scores were creating by computing an overall mean for a possible range of scores from 1 to 7, with higher scores indicating greater sociosexuality (i.e., more openness, desire, and engagement in casual sex behavior). Cronbach's alpha indicated there was a high level of internal consistency for the scale ( $\alpha = 0.86$ ).

3.1.2.4. Self-perceived mate value. Self-perceived mate value was measured using Li's Mate Vale scale (Li, 2017; see Jonason & Bulyk, 2020; Jonason et al., 2019). The scale consists of 20 items where participants report their agreement (1 = strongly disagree, 7 = strongly agree)with six items measuring attractiveness as a short-term mate (e.g., "I get a lot of flirtations or signals indicating interest from potential mates"), eight items measuring attractiveness as a long-term mate (e.g., "People seem to consider me more suitable for a long-term relationship than short term (casual sex) ones"), and six items measuring general unattractiveness as a mate (e.g., "I tend to have a more difficult time attracting potential mates than other people do"). Scores were created by computing a mean of each set of items, with higher scores indicating greater self-perceived mate value (i.e., attractiveness as a short-term mate and long-term mate, and self-perceived general unattractiveness as a mate). Cronbach's alpha indicated there was a high level of internal consistency for the short-term mate attractiveness subscale ( $\alpha = 0.93$ ), the long-term mate attractiveness subscale ( $\alpha = 0.89$ ), and the general unattractiveness as a mate subscale ( $\alpha = 0.90$ ).

#### 3.1.3. Procedure

Participants were given a link to complete an online survey. Participants first responded to the demographic questions, followed by the sociosexuality questions, the self-perceived mate value questions, and finally the perceptions of sexual harassment questions for one of the vignettes. Participants were randomly assigned to receive either the vignette in which Jason drops his fork and Diane makes the comment, or the vignette in which Diane drops her fork and Jason makes the comment. After completion of the survey, participants were compensated for their time.

All procedures and measures were approved by the first four authors' university's Institutional Review Board (IRB). Participants gave full informed consent before participating in the study, and no deception was used. Parental consent was received for participants under the age of 18.

#### 3.2. Results

Descriptive statistics for the self-perceived mate-value scores, sociosexuality scores, and perception ratings for men and women appear in Table 2. There were sex differences in self-perceived long-term attractiveness (i.e., women reporting greater long-term attractiveness), sociosexuality (i.e., with men reporting greater sociosexuality), as well as all four perception ratings. Women were more likely to report that the comment should be considered sexual harassment, the target would feel insulted, and the speaker intended to sexually harass the target. Women were less likely to report that the target would consider the comment funny.

The means (and standard deviations) of the perception ratings as a function of sex of participant and vignette appear in Table 3. As shown in the table, one notable difference between the two vignettes was the perception of intent. While there was no sex difference in perceptions of intent when Jason made the comment, when Diane made the comment, women attributed more intent to sexually harass than men. Another notable difference is that the observed sex differences in perceptions (apart from whether the target would consider the comment funny) appear to be larger when Diane made the comment.

As the dependent variables were expected to influence each other, a cascade model was used to test the effect of individual differences on

#### Table 2

Means (and standard deviations) of self-perceived mate value scores, sociosexuality scores, and perceptions ratings as a function of sex of participant.

Measure	Men	Women	t	Cohen's d
	Mean (SD)	Mean (SD)		
Short-term	3.65	3.55	-0.91 <sup>c</sup>	
attractiveness <sup>a</sup>	(1.42)	(1.53)		
Long-term	5.13	5.31	2.17*	0.16**
attractiveness <sup>a</sup>	(1.09)	(1.13)		
General	3.13	2.91	-1.92	
unattractiveness <sup>a</sup>	(1.53)	(1.47)		
SOI-R <sup>b</sup>	4.35	3.14	-10.36 <sup>c,***</sup>	-0.79
	(1.66)	(1.43)		
Sexual harassment	4.12	4.90	5.57 <sup>c,***</sup>	0.42
	(1.95)	(1.81)		
Insult	4.03	4.56	3.85***	0.29
	(1.92)	(1.80)		
Intent	3.21	3.49	2.10*	0.16
	(1.84)	(1.76)		
Funny	4.15	3.34	-6.19***	-0.46
	(1.84)	(1.69)		

<sup>a</sup> Self-perceived mate value scores (Li, 2017).

<sup>b</sup> Mean sociosexuality score (Penke & Asendorpf, 2008).

<sup>c</sup> The degrees of freedom for this *t*-test were corrected to account for unequal variances based on Levene's test for equality of variances.

#### Table 3

Means (and standard deviations) of the perceptions of sexual harassment (SH), insult, intent, and humor (funny) as a function of sex of participant and who made the comment (Jason vs. Diane).

Measure	Jason ma	Jason made comment		Diane made comment		
	Men	Women	t	Men	Women	t
SH	4.84 (1.76)	5.45 (1.69)	3.34*** ( <i>d</i> = 0.35)	3.36 (1.84)	4.36 (1.75)	5.30*** ( <i>d</i> = 0.56)
Insult	4.86 (1.71)	5.23 (1.71)	2.03* ( <i>d</i> = 0.22)	3.15 (1.74)	3.92 (1.65)	4.31*** ( <i>d</i> = 0.45)
Intent	3.80 (1.87)	3.97 (1.82)	0.90	2.58 (1.59)	3.02 (1.56)	$2.63^{**}$ ( $d = 0.28$ )
Funny	3.63 (1.86)	2.68 (1.68)	$-5.15^{***}$ ( $d =$ -0.54)	4.69 (1.65)	3.97 (1.45)	$-4.33^{a,***}$ ( $d = -0.46$ )

*Note. n* = 309 men, 433 women.

<sup>a</sup> The degrees of freedom for this *t*-test were corrected to account for unequal variances based on Levene's test for equality of variances.

these perceptions (Bose & Figueredo, 2021; Davis, Guggenheim, Figueredo, & Locke, 2007; Figueredo et al., 2020). A series of hierarchical linear regressions were conducted with each prior dependent variable entered as the first predictor variable in each subsequent model. This strategy statistically controls for indirect effects of the predictor variables through the other dependent variables, allowing for each regression model to test the direct effects of the predictors. The hypothesized sequence of dependent variables in terms of their order of influence was from greater perceptions of intent to lower perceptions of humor to more insulting perceptions to more perceptions of sexual harassment. In each model, the predictor variables were entered in the following order: sample (Undergraduate vs. M-Turk), sexual orientation (bisexual/homosexual vs. heterosexual), sex of respondent, vignette (Diane vs. Jason as speaker), self-perceived mate value (short-term attractiveness, longterm attractiveness, and general unattractiveness), and sociosexuality.

\_\_\_\_\_ *p* < .05.

*p* < .01.

*p* < .001.

3.2.1. Cascade equation 1: predicting perceptions of intent

Equation 1 tested the effect of vignette (who made the comment) and individual differences on perceptions of whether the speaker intended to sexually harass the target. Overall, the model predicts approximately 14% of the variance in perceptions of intent, F(8,733) = 14.31, p < .001,  $R^2 = 0.135$ . Inspection of Table 4 indicates that sample, sexual orientation, sex of respondent, vignette, and self-perceived general unattractiveness were significant unique predictors of perceptions of intent; whereas, self-perceived short-term and long-term attractiveness and sociosexuality were not. The main effects of sample and sexual orientation indicate that college undergraduates and heterosexuals perceived less intent. The other main effects indicate that men perceived less intent than women, less intent was perceived when Diane made the comment, and that perceptions of intent increased as self-perceived general unattractiveness as a mate increased. Inspection of the squared semi-partial correlations indicates the strongest predictor of perceptions of intent was vignette (explaining approximately 8% of unique variance) followed by sexual orientation (explaining approximately 5% of unique variance).

#### 3.2.2. Cascade equation 2: predicting perceptions of humor

Equation 2 tested the effect of vignette and individual differences on perceptions of whether the target would consider the comment funny, controlling for perceptions of intent. Overall, the model predicts approximately 35% of the variance in perceptions of humor, F(9,732) =42.77, p < .001,  $R^2 = 0.345$ . Table 5 indicates that intent, sample, sex of respondent, vignette, all three self-perceived mate value scores, and sociosexuality were significant unique predictors of perceptions of humor. Sexual orientation, however, did not predict unique variance in perceptions of humor. The main effect of intent indicates that as perceptions of intent increased, perceptions of humor decreased. The main effect of sample indicates the college undergraduates perceived less humor. The other main effects indicate that men perceived more humor, more humor was perceived when Diane made the comment, and as selfperceived mate value and sociosexuality increased, so did perceptions of humor. Inspection of the squared semi-partial correlations indicates the strongest predictors of perceptions of humor were perceptions of intent (explaining approximately 14% of unique variance), followed by vignette (explaining approximately 8% of unique variance) and selfperceived general unattractiveness (explaining approximately 5% of unique variance).

#### 3.2.3. Cascade equation 3: predicting perceptions of insult

Equation 3 tested the effect of vignette and individual differences on perceptions of whether the target would consider the comment

#### Table 4

Cascade equation 1: Hierarchical linear regression analysis predicting perceptions of whether speaker intended to sexually harass the target.

Variable	В	SE(B)	β	sr <sup>2</sup>
Sample <sup>a</sup>	-0.46	0.13	-0.13***	0.02
Sexual orientation <sup>b</sup>	-0.34	0.17	-0.07*	0.05
Sex of respondent <sup>c</sup>	-0.37	0.14	-0.10**	0.01
Vignette <sup>d</sup>	-1.02	0.12	-0.28***	0.08
Short-term attractiveness <sup>e</sup>	0.02	0.05	0.02	
Long-term attractiveness <sup>e</sup>	0.08	0.06	0.05	
General unattractiveness <sup>e</sup>	0.19	0.05	0.16***	0.02
SOI-R <sup>f</sup>	-0.02	0.05	-0.02	

<sup>a</sup> Coded as 0 = M-Turk, 1 = Undergraduates.

 $^{\rm b}$  Coded as 0 = bisexual/homosexual, 1 = heterosexual.

<sup>c</sup> Coded as 0 =female, 1 =male.

 $^{d}$  Coded as 0 = Jason made comment, 1 = Diane made comment.

<sup>e</sup> Self-perceived mate value scores (Li, 2017).

<sup>f</sup> Sociosexuality score (Penke & Asendorpf, 2008).

\* p < .05.

 $\sum_{***}^{**} p < .01.$ 

*p* < .001.

#### Table 5

Cascade equation 2: Hierarchical linear regression analysis predicting perceptions of whether target would consider the comment funny.

Variable	В	SE(B)	β	sr <sup>2</sup>
Intent	-0.35	0.03	-0.35***	0.14
Sample <sup>a</sup>	-0.65	0.11	$-0.18^{***}$	0.04
Sexual orientation <sup>b</sup>	0.17	0.15	0.04	
Sex of respondent <sup>c</sup>	0.47	0.12	0.13***	0.02
Vignette <sup>d</sup>	0.90	0.11	0.25***	0.08
Short-term attractiveness <sup>e</sup>	0.20	0.04	0.16***	0.03
Long-term attractiveness <sup>e</sup>	0.20	0.04	0.21***	0.02
General unattractiveness <sup>e</sup>	0.25	0.04	0.21***	0.05
SOI-R <sup>f</sup>	0.09	0.04	0.08*	0.04

<sup>a</sup> Coded as 0 = M-Turk, 1 = Undergraduates.

<sup>b</sup> Coded as 0 = bisexual/homosexual, 1 = heterosexual.

<sup>c</sup> Coded as 0 = female, 1 = male.

<sup>d</sup> Coded as 0 = Jason made comment, 1 = Diane made comment.

<sup>e</sup> Self-perceived mate value scores (Li, 2017).

<sup>f</sup> Sociosexuality score (Penke & Asendorpf, 2008).

\* p < .05.

*p* < .001.

insulting, controlling for perceptions of humor and intent. Overall, the model predicts approximately 53% of the variance in perceptions of insult, F(10,731) = 82.31, p < .001,  $R^2 = 0.53$ . Table 6 indicates that perceptions of humor and intent, sample, vignette, and all three selfperceived mate value scores were significant unique predictors of perceptions of insult. Sexual orientation, sex of respondent, and sociosexuality did not predict unique variance in perceptions of insult. The main effect of humor indicates that as perceptions of humor increased, perceptions of insult decreased. The main effect of intent indicates that as perceptions of intent increased, so did perceptions of insult. The main effect of sample indicates the college undergraduates perceived more insult. The other main effects indicate that more insult was perceived when Jason made the comment, and as self-perceived mate value increased, so did perceptions of insult. Inspection of the squared semipartial correlations indicates the strongest predictors of perceptions of insult were perceptions of intent (explaining approximately 20% of unique variance), followed by perceptions of humor (explaining approximately 15% of unique variance).

#### 3.2.4. Cascade equation 4: predicting perceptions of sexual harassment

Equation 4 tested the effect of vignette (who made the comment) and individual differences on perceptions of whether the comment should be considered sexual harassment, controlling for perceptions of insult,

#### Table 6

Cascade equation 3: Hierarchical linear regression analysis predicting perceptions of whether target would be insulted by the comment.

Variable	В	SE(B)	β	sr <sup>2</sup>
Funny	-0.37	0.03	-0.36***	0.15
Intent	0.42	0.03	0.40***	0.20
Sample <sup>a</sup>	0.35	0.10	0.09***	0.02
Sexual orientation <sup>b</sup>	-0.07	0.13	-0.01	
Sex of respondent <sup>c</sup>	-0.12	0.11	-0.03	
Vignette <sup>d</sup>	-0.52	0.10	-0.14***	0.03
Short-term attractiveness <sup>e</sup>	0.08	0.04	0.06*	0.01
Long-term attractiveness <sup>e</sup>	0.16	0.05	0.10***	0.01
General unattractiveness <sup>e</sup>	0.14	0.04	0.11***	0.02
SOI-R <sup>f</sup>	0.04	0.04	0.04	

<sup>a</sup> Coded as 0 = M-Turk, 1 = Undergraduates.

 $^{\rm b}$  Coded as 0 = bisexual/homosexual, 1 = heterosexual.

<sup>c</sup> Coded as 0 = female, 1 = male.

 $^{\rm d}\,$  Coded as 0 = Jason made comment, 1 = Diane made comment.

<sup>e</sup> Self-perceived mate value scores (Li, 2017).

f Sociosexuality score (Penke & Asendorpf, 2008).

\**p* < .05.

*p* < .001.

humor, and intent. Overall, the model predicts approximately 56% of the variance in perceptions of sexual harassment, F(11,730) = 85.99, p  $< .001, R^2 = 0.564$ . Table 7 indicates that perceptions of insult, humor, and intent, sample, sex of respondent, vignette, and self-perceived longterm attractiveness were significant unique predictors of perceptions of sexual harassment. Sexual orientation, vignette, self-perceived shortterm attractiveness and general unattractiveness, and sociosexuality did not predict unique variance in perceptions of sexual harassment. The main effect of insult indicates that as perceptions of insult increased, perceptions of sexual harassment also increased. The main effect of humor indicates that as perceptions of humor increased, perceptions of sexual harassment decreased. The main effect of intent indicates that as perceptions of intent increased, so did perceptions of sexual harassment. The main effect of sample indicates the college undergraduates perceived more sexual harassment. The other main effects indicate that women perceived more sexual harassment than men, and as selfperceived long-term attractiveness as a mate increased, so did perceptions of sexual harassment. Inspection of the squared semi-partial correlations indicates the strongest predictors of perceptions of sexual harassment were perceptions of intent (explaining approximately 13% of unique variance), followed by perceptions of insult (explaining approximately 9% of unique variance) and sample (explaining approximately 5% of unique variance).

#### 4. Discussion

Using an adaptationist perspective, the purpose of the current studies was to replicate previously found sex differences in perceptions of sexual harassment and extend those findings by investigating the effects of sex of potential perpetrator/target and individual differences in selfperceived mate value and sociosexuality. Consistent with what was predicted, in both studies, we found that women were more likely than men to perceive a sexually ambiguous comment as sexual harassment. Interestingly, while we did not find the expected sex differences in perceptions of intent, humor, or insult within subjects (Study 1), there was evidence of sex differences between subjects in the predicted directions with women perceiving more intent and insult and less humor than men (Study 2). It should also be noted the sex difference in perceptions of sexual harassment within subjects was specific to when the potential perpetrator was a woman. In Study 1, when interpreting the ambiguous comment made by a man, over 80% of both men and women agreed the comment should be considered sexual harassment. This

#### Table 7

Cascade equation 4: Hierarchical linear regression analysis predicting perceptions of whether comment should be considered sexual harassment.

Variable	В	SE(B)	β	sr <sup>2</sup>
Insult	0.31	0.04	0.30***	0.09
Funny	-0.18	0.04	-0.17***	0.03
Intent	0.36	0.03	0.34***	0.13
Sample <sup>a</sup>	0.63	0.10	0.16***	0.05
Sexual orientation <sup>b</sup>	-0.14	0.13	-0.03	
Sex of respondent <sup>c</sup>	-0.25	0.11	-0.07**	0.01
Vignette <sup>d</sup>	-0.17	0.10	-0.04	
Short-term attractiveness <sup>e</sup>	0.01	0.04	0.004	
Long-term attractiveness <sup>e</sup>	0.10	0.05	0.06*	0.01
General unattractiveness <sup>e</sup>	0.03	0.04	0.03	
SOI-R <sup>f</sup>	0.01	0.04	0.01	

<sup>a</sup> Coded as 0 = M-Turk, 1 = Undergraduates.

<sup>b</sup> Coded as 0 = bisexual/homosexual, 1 = heterosexual.

<sup>c</sup> Coded as 0 = female, 1 = male.

 $^{d}$  Coded as 0 = Jason made comment, 1 = Diane made comment.

<sup>e</sup> Self-perceived mate value scores (Li, 2017).

<sup>f</sup> Sociosexuality score (Penke & Asendorpf, 2008).

\* p < .05.

 $\sum_{***}^{**} p < .01.$ 

*p* < .001.

suggests that male and female college students similarly perceive that a man's ambiguous behavior (directed to a female target) likely infers his sexual interest/advances. They did not, however, tend to agree when interpreting the same ambiguous comment from a woman and directed to a male target. Female college students were about twice as likely to perceive the female speaker's comment as sexual harassment than male college students. This is consistent with other evidence that, in cases of hostile work environment situations (e.g., telling a sexualized joke, asking a colleague out on a date, and giving a colleague a sexualized hug), men perceive less sexual harassment when the potential perpetrator is a woman targeting another man (Kessler et al., 2020). In Study 2, when inspecting this sex difference between subjects, we found the expected sex differences for both the male and female potential perpetrator, though it should be noted the sex differences for perceptions of harassment and insult were larger when the potential perpetrator was a woman and the target was a man (similar to Study 1). Furthermore, the cascade model indicates that sex of respondent continues to have a direct effect on perceptions of sexual harassment after controlling for sex differences in perceptions of intent, humor, and insult. This corresponds to the results reported by other researchers regarding sex differences in perceptions of sexual advances with men seeing them as less negative (Klümper & Schwarz, 2020) and women perceiving a wider range of situations as constituting sexual harassment than men (Rothgerber et al., 2021).

Both studies also provide evidence that the sex of the potential perpetrator/target is relevant to perceptions. In Study 1, regardless of sex of respondent, when a man made the comment to a woman, college undergraduates were more likely to perceive it as an insult and sexual harassment. Unexpectedly, we found (within subjects) when a woman made the same ambiguous comment to a man, it was more likely to be perceived as intentional sexual harassment and the target was also perceived to find it more humorous. It is important to note that the effect of speaker/target was rather small for perceptions of sexual harassment and insult, whereas it had a much larger effect on perceptions of whether the comment was perceived to be intentional and humorous. And, although Study 1 undergraduates were two and a half times more likely to perceive the ambiguous comment as intentional sexual harassment when a woman was the potential perpetrator compared to a man, they were also 15 times more likely to perceive the comment as humorous when the woman made the comment and the target was a man. This suggests a potential double standard when interpreting ambiguous situations. Perceptions of potential harassment against men appear not to be taken as seriously as harassment against women, even though the harassment directed toward men is perceived as being more intentional than that directed toward women. This would be consistent with Reynolds et al. (2020) work suggesting that male suffering is not viewed with as much sympathy as female suffering. Evidence from the Study 2 cascade model suggests that sex of speaker/target had an indirect effect on perceptions of sexual harassment by directly influencing perceptions of intent, humor, and insult such that, when the potential perpetrator was a man, there were greater perceptions of intent, less humor, and more insult.

Regarding individual differences influencing perceptions, selfperceived mate value did contribute to perceptions. As predicted, individuals with higher self-perceived general unattractiveness perceived greater intent to sexually harass the target. Self-perceived general unattractiveness was also found to have a direct effect on perceptions of humor and insult. However, inconsistent with what we predicted, perceptions of humor were found to increase with higher self-perceived general unattractiveness. Furthermore, there was no direct effect of self-perceived general unattractiveness as a mate on perceptions of sexual harassment controlling for the effect on perceptions of intent, humor, and insult. Self-perceived attractiveness as a short-term mate was found to only have a direct effect on perceptions of humor and insult such that as self-perceived short-term mate attractiveness increased, so did perceptions of both humor and insult. Lastly, although self-perceived

attractiveness as a long-term mate did not influence perceptions of intent as predicted, self-perceived long-term mate attractiveness did have a direct effect on perceptions of humor, insult, and sexual harassment. Out of the three mate value measures, self-perceived attractiveness as a long-term mate was the only mate value measure to have a direct effect on perceptions of sexual harassment. As predicted, individuals with higher self-perceived long-term mate value perceived more sexual harassment. While there has been limited research published on the impact of one's own mate value on perceptions of sexual harassment or intent, Kohl and Robertson (2014) reported that, for men, high mate value was associated with high levels of sexual overperception in a nightclub scenario. Future studies of perceptions of harassment, as well as studies of actual behavior, should include self and/or other perceived mate value measures to further investigate its influence. Our results suggest that a long-term mating mindset has a direct effect on perceptions of sexually ambiguous behavior, while selfperceived unattractiveness as a mate has an indirect effect. However, caution should be used when interpreting these relatively small effects as future research is needed to clarify their role.

Interestingly, our predictions that individual differences in sociosexuality would influence perceptions were largely not supported. Sociosexuality had no direct effect on any perceptions other than perceptions of humor. Consistent with what was predicted, individuals with less restricted (i.e., higher) sociosexuality perceived more humor. The general lack of effects was unexpected as studies have reported that higher sociosexuality is associated with perceiving sexual advances as less harmful (Klümper & Schwarz, 2020). Studies have also reported a relationship between sociosexuality and sexual harassment behavior such that individuals who score high on some components of sociosexuality are more likely to report being sexually harassed as well as harassing other opposite-sex individuals (Bendixen & Kennair, 2017).

There may be several reasons for our inconsistent findings. One may be the different methodologies between the current studies and previous research, specifically differences in what was being measured (i.e., perceptions versus actual behavior). While the current studies assessed perceptions, Bendixen and Kennair (2017) asked participants to report their experiences of being sexually harassed and sexually harassing others, finding men who reported more unrestricted attitudes were more likely to sexually harass women as well as be sexually harassed by women and that both men and women who reported more unrestricted sexual behavior were more likely to be sexually harassed by both same sex and opposite sex perpetrators. It is also important to note that the studies of behavior (Bendixen & Kennair, 2017; Kennair & Bendixen, 2012) have also produced larger effect sizes than those focused on perceptions of sexual intent (Kohl & Robertson, 2014) suggesting that sociosexuality may explain more variance in behavior than in perceptions. In addition, we were explicitly measuring perceptions of sexual harassment while several studies that found effects for sociosexuality were focused on perceptions of sexual interest and/or sexual advances (Klümper & Schwarz, 2020; Kohl & Robertson, 2014). Another difference in the use of scenarios is that participants in our studies were asked to report their perceptions of how the "target" would interpret the comment (i.e., as sexual harassment, an insult, funny) and whether the "speaker" intended to sexually harass the target. This could be different than asking participants to report on how they themselves would react as the target or their intent as the speaker. Do people interpret/perceive their behavior/intentions in the same way as they perceive others' behavior/intentions? To determine whether these methodological differences account for the inconsistent results, additional research will be required.

There were also differences between the samples in terms of participants. Study 1 included only college undergraduates. Study 2 included both college undergraduates and M-Turk community participants. According to the cascade model, sample had a direct effect on all four perceptions such that the community sample perceived less insult and less harassment as well as more humor despite also perceiving more intent. This suggests that college samples may be more sensitive to indicators of insult and harassment, perhaps the result of the abundance of attention to sexual harassment on college campuses (Bondestam & Lundqvist, 2020). Another possible factor influencing this difference between populations is differential life experience, particularly as participants from the general population perceived more intent/humor yet less sexual harassment. This might suggest the general population sample is more likely to judge intent as inoffensive.

#### 4.1. Limitations and future directions

There are a few limitations to our studies that should be acknowledged. The first one being that we had more women than men in our sample, particularly in the undergraduate portion. This is largely a reflection of the demographic sex difference in college students, which is particularly prominent in psychology programs. While we included sex of the participant in the cascade model, future research with larger samples of men and women would allow for better testing of whether some of these findings were driven by sex-specific interactions. Although we did not make any a priori predictions about interactions in the current studies, in Study 2, we found when Jason made the comment to Diane, men and women did not differ in their perceptions of intent. However, when Diane made the comment to Jason, women were more likely to perceive intent on Diane's behalf than men. This suggests there may be an interaction between sex of observer and sex of perpetrator/ target, at least with regard to perceptions of one's intent to sexually harass a target.

When scenarios are used to assess perceptions of sexual harassment, it could be useful to examine differences between ambiguous versus clear situations of harassment (e.g., touching, groping, sexually explicit comments). It may be that sex differences in perceptions are more likely to occur (and to be greater) when individuals are presented with ambiguous situations that are more open to interpretation; whereas the sex difference may go away in cases that are clearly deliberate sexual harassment. This explanation would be consistent with evidence from studies that have compared perceptions of sexual harassment using clear instances of hostile work environment harassment and quid pro quo harassment, finding less sex differences in the instances of the obvious quid pro quo acts of harassment (Kessler et al., 2020, 2021). It would be interesting to investigate the effect of the sex of the perpetrator/target in ambiguous versus clear situations of harassment within the same study. The current studies suggest that in ambiguous situations, the sex of the potential perpetrator/target influences how the interaction is perceived. Does the sex of perpetrator/target in clear situations of harassment also influence how those situations are interpreted?

As noted earlier, further research should investigate whether there are differences between perceptions of one's own behavior and another's behavior that may also explain some inconsistencies within the literature. Future research is also needed to examine other relevant factors that may influence perceptions of sexual harassment and intent. While the current study was able to explain some of the variance in perceptions, it is important to note that (1) factors in the current study explained more variance in the perceptions of sexual harassment (56%) than perceptions of intent (14%); and (2) there is still substantial remaining variance that was not explained. Other factors that may explain additional variance include one's own status as well as the status and physical attractiveness of the perpetrator/target. It may also be the case that levels of perceived and/or experienced intrasexual competition may make women more sensitive to indicators of other women's sexual strategies.

#### 4.2. Conclusions

Although further research assessing the role of additional factors is needed to more fully explain variation in perceptions of sexual harassment, it seems clear that sex, sex of perpetrator/target, and one's own

#### J.A. Hehman et al.

self-perceived mate value influence how people interpret situations with ambiguous content that can be interpreted as sexual harassment. What remains unclear is the relevance of sociosexuality or sexual strategies beyond sex differences in shaping these perceptions. These results, along with some of the literature previously discussed, suggest that differences in sexual strategies along with sexual overperception biases may play a significant role in this aspect of conflict between the sexes. Together these findings support the importance of using an adaptationist perspective when evaluating perceptions of sexual harassment by underlining the relevance of sex of the observer and the relevance of other individual difference factors that also influence those perceptions. Given the standard used in the US legal system is that of whether a "reasonable" person would consider the situation sexual harassment, sex differences in perceptions of ambiguous situations suggest that a reasonable man and reasonable woman may disagree in their interpretation and that their perceptions also depend on the sex of the perpetrator/target. Our findings suggest that, at least for women, these types of ambiguous comments (even those that could be a single transgression) are likely to be perceived as sexual harassment. This could suggest that the #MeToo movement has sensitized women to be hyperaware of potential harassment. Regardless, sex differences in perceptions of ambiguous situations and the influence of the sex of the perpetrator/target have implications for workplace harassment prevention training.

#### CRediT authorship contribution statement

Jessica A. Hehman: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization, Supervision, Funding acquisition. Catherine A. Salmon: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Visualization, Funding acquisition. Anthony Pulford: Conceptualization, Methodology, Investigation, Writing – review & editing. Eric Ramirez: Conceptualization, Methodology, Investigation, Writing – review & editing. Peter K. Jonason: Conceptualization, Methodology, Writing – review & editing.

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#### J.A. Hehman et al.

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