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RESEARCH ARTICLE

Examining Ecological Harshness, Sociosexuality, and Mate Value in Women's Preferences for Men's Height and Shoulder-to-Hip Ratio

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Abstract

Physical features in men, such as height and shoulder-to-hip ratio (SHR), have been shown to contribute to women's mate preferences. The independent and interactive effects of height and SHR have been shown to be associated with attractiveness, masculinity, dominance, and fighting ability. It is suggested that these sexually dimorphic features are a reflection of men's genetic quality, in addition to the ability to provide direct benefits (e.g., protection, resource provisioning). The current study investigated how ecological harshness may modulate women's mate preferences to men displaying variations in height and SHR ratio. In a sample of predominately Hispanic women ($N = 247$), manipulating ecological harshness did not affect their ratings of men. Women considered taller men with larger SHRs as more attractive, masculine, dominant, and higher in fighting ability. Interestingly, these ratings were moderated by individual differences in women's mate value but not sociosexuality. Women with higher mate value rated all men who were taller than the anchor woman (172 cm) in the presentation sequence as more attractive, masculine, dominant, and higher in fighting ability. The findings replicated previous research on the interactive effects of men's height and SHR and showed that women calibrate their mating preferences as a function of their overall mate quality (i.e., mate value).

Keywords Ecological harshness · Sociosexuality · Mate value · Shoulder-to-hip ratio · Height · Mate preferences

Women's mate preferences for male mates are contingent upon factors that convey indirect (i.e., genetic) and direct benefits (i.e., resources) (Buss & Schmitt, 1993). Physical traits such as facial and body masculinity, and height, are cues that are used in the perception of physical attractiveness in mate choice (Little et al., 2001; Sell et al., 2017; Symons, 1995). These physical cues are important in mate assessment as they may convey information that may increase reproductive success, as men with exaggerated sexual dimorphic features are thought to be advertising high-quality genes (Jones et al., 2001; Krams et al., 2014; Little et al., 2001; Scheib et al., 1999). Nonetheless, women's mate preferences are also considered to be contingent upon ecological conditions, where they may calibrate their mate preferences as a function of the availability of resources (Garza et al., 2021). It has been suggested that women's sociosexuality, which is a measure of overall short-term mating interest, and mate value, a measure of self-perceived attractiveness, may drive women's mate preferences for men with enhanced secondary sexual characteristics (e.g., facial masculinity, muscularity) (Reeve et al., 2017; Simpson & Gangestad, 1992). In the current study, we assess if ecological harshness influences women's preferences for men's upper body mass (i.e., shoulder-to-hip ratio (SHR)) and height. We also consider the role of individual differences in sociosexuality and mate value in moderating women's overall mate preferences.

Height

It has been suggested that height plays a role in men's physical attractiveness. Height conveys information about a mate's indirect (i.e., genetic) and direct benefits (i.e., resource acquisition) in relation to mate choice. Height is considered an underlying signal of biological quality due to its association with overall fitness (Pawlowski et al., 2017) and reproductive potential (Mueller & Mazur, 2001; Nettle, 2002). Indeed, research has shown that taller men are more successful in reproduction (i.e., more sexual opportunities and offspring) (Mueller & Mazur, 2001; Nettle, 2002), and they are better able to implement their

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mating strategy (i.e., short-term mating) compared to shorter men (Frederick & Jenkins, 2015; Pawlowski et al., 2000). However, research has also shown that there is a curvilinear relationship with height and reproductive success, with average height men attaining the highest reproductive success (Stulp et al., 2012). In mate choice, women consider height to be an important factor in what they consider attractive in men (Salska et al., 2008). Women rate men who are taller as more attractive (Pazhoohi et al., 2023a; Sell et al., 2017). They demonstrate a stronger preference for men to be taller than them and, they report a higher satisfaction in their mate choice if their current partner is taller than them (Stulp et al., 2013). In reference to men's self-perceptions, taller men report higher satisfaction with themselves (Brewer & Riley, 2009; Stulp et al., 2013) and report that they have more attractive partners (Feingold, 1982).

In addition to women's perceptions of men's attractiveness, height also influences perceptions of intrasexual-related traits, such as dominance, masculinity, and fighting ability. Men and women perceive taller men to be stronger (Sell et al., 2009), aggressive (Archer & Thanzami, 2007), higher in fighting ability (Von Rueden et al., 2008), dominant (Ellis, 1994), and therefore, prefer larger distances from them for social interactions compared to shorter men (Pazhoohi et al., 2019b, 2023b). They report more dominant type of behavior, such as providing limited space in interpersonal interactions (Stulp et al., 2015). Men who are successful in competitive contests also have an advantage in accessing potential partners in a mating arena (Puts, 2010). Although males who are competitive may have an advantage in mating, they may present a potential cost to their partners, in the form of partner desertion or conflict in a relationship (Boothroyd et al., 2008, 2013). Therefore, in mate choice, women may make trade-offs in obtaining indirect over direct benefits.

Shoulder-to-Hip Ratio

Shoulder-to-hip ratio is a sexually dimorphic trait in humans, where men on average have larger SHR compared to women. SHR is used as a metric of upper body mass and is considered an honest signal of immunocompetence, as only high-quality males would be able to withstand environmental pressures and be able to display a costly trait (Folstad & Karter, 1992; Zahavi & Zahavi, 1997). Muscularity may reflect underlying physiological quality (e.g., parasite and disease resistance) given the energetic demands of growing larger and fitter bodies (Sell et al., 2017). Men with greater upper body mass, as measured by SHR, are rated higher on attractiveness (Braun & Bryan, 2006; Dixson et al., 2014; Furnham & Nordling, 1998; Garza & Byrd-Craven, 2019; Garza et al., 2017; Horvath, 1981; Pazhoohi et al., 2019a. 2023a; Sidari et al., 2021; Sell et al., 2017; Tovée et al., 1999), and ratings have shown cross-cultural consistency (Dixson et al., 2007a, b , 2010; Mautz et al., 2013). Men's SHR is also associated with perceptions of intrasexual competition. Men with larger SHR are rated as more masculine, dominant, and higher on fighting ability compared to men with lower SHR (Pazhoohi et al., 2023a), and larger SHR differentially modulates neural activity at regions associated with body perception (Pazhoohi et al., 2023b). This may suggest that men's physical morphology is instrumental in contest competitions, such as appearing more masculine and dominant, which may be advantageous in providing direct benefits, such as protection and resource provisioning.

However, in mate choice, women rely on a combination of phenotypic traits, rather than one (Hill et al., 2013). The combination of phenotypic traits may amplify these preferences across perceptions. For instance, women rate taller men with broader shoulders as more attractive, masculine, dominant, and higher on fighting ability, suggesting that the interactive effects of men's morphology contribute to women's assessments of them (Pazhoohi et al., 2023a).

Ecological Harshness

Ecological conditions, such as resource scarcity and violence, play an instrumental role in mate choice. Ecological cues provide individuals with an assessment of availability of resources, and women may accordingly modify their preferences for men who have traits that may provide indirect or direct benefits. For instance, ecological harsh environments may drive individuals to pursue a faster reproductive strategy (i.e., earlier investment in reproduction), and therefore choose a partner based on overall genetic quality (Belsky et al., 1991; Gangestad & Simpson, 2000). Women show a preference for facial masculinity in harsher environments, suggesting a prioritization for high-quality genes (DeBruine et al., 2010; Marinkowska et al., 2019). Women also show a preference for facial masculinity in countries with higher income inequality and in experimental studies where women are primed with violence (Little et al., 2011a; Snyder et al., 2011). Given the degree of unpredictability and extrinsic mortality, women may trade off the benefits obtained from choosing a partner with high-quality genes over a partner that can provide direct benefits.

Conversely, environmental harshness may promote mating strategies that favor parental investment from both parents (Geary et al., 2004; Mace, 2000), which may lead to higher survival of offspring. Women show a preference for men with parental qualities (i.e., good dad traits) when primed with ecological harshness (Lee & Zietsch, 2011). They favor qualities associated with formidability when crime rates are higher in their environment (Meskelyte & Lyons, 2022; Ryder et al.,

2016). Stronger men are perceived as effective leaders and fathers when ecologies are desperate (Brown et al., 2024). Women have a lower masculinity preference when considering exposure to public violence and violence directed to their children (Borras-Guevara et al., 2017). Stronger men are preferred over weak men when primed with resource scarcity, in comparison to safe or violent type of ecological primes (Garza et al., 2021). Other research has suggested that women may prioritize good gene traits in safer environments, as resources that may be provided from an investing partner have already been met (Marcinkowska et al., 2019). This latter perspective suggests that in a safer environment, there may be fewer benefits obtained from an investing partner. This, in turn, would favor women to pursue mating strategies that maximize high-quality genes over parental investment.

Individual Differences in Sociosexuality and Mate Value

Individual differences in sociosexuality and mate value have shown to contribute to women's perceptions of men's attractiveness. Sociosexuality, or one's propensity to engage in uncommitted sexual encounters, has been used as a measure of short-term mating orientation. According to sexual strategies theory (Buss & Schmitt, 1993), women have faced the ancestral problem of finding a mate that displays good genes. One solution to the adaptive problem faced by women is to pursue a short-term mating strategy to incur the genetic benefits over pursuing a long-term investment. Women show preferences for physical attractiveness when pursuing short-term mating opportunities (Li et al., 2002). They demonstrate preferences for facial masculinity as a function of short-term mating orientation (Ekrami et al., 2021; Little et al., 2002, 2011b; Marcinkowska et al., 2018, 2019; Penton-Voak et al., 2003; Stower et al., 2020; Waynforth et al., 2005) and demonstrate increased visual attention to those men (Garza & Byrd-Craven, 2023). Further, short-term mating-oriented women show a preference for men's somatotypes indicative of body muscularity (Garza & Byrd-Craven, 2021; Little et al., 2007, 2011b; Provost et al., 2006, 2008). These findings point to the role of short-term mating in women and their overall preferences for features in men that connote high-quality genes.

Another individual difference measure that is associated with women's preferences for men is mate value. It has been suggested that women may calibrate their mating preferences as a function of their self-perceived mate value (Edlund & Sagarin, 2014). Women with high mate value may be more successful in implementing their mating strategy and obtain desirable traits in a partner, such as attractiveness and earning potential (Buss & Shackelford, 2008). They are better able to match what they prefer in a partner to their actual choices in a relationship (Winceniak et al., 2015). Research on physical morphology has shown that mate value is associated with preferring men with attractive traits. Women who report a higher self-perceived attractiveness show a stronger preference for men with masculine faces (Garza & Byrd-Craven, 2021; Little et al., 2001), and view them longer in a visual preference task (Garza & Byrd-Craven, 2023). These findings suggest that mate value in women may serve as a calibrating tool in choosing partners that have ideal features.

Current Study

The current study investigated whether ecological harshness moderates the effects of men's SHR and height on women's perceptions of attractiveness, masculinity, dominance, and fighting ability. Past research has suggested that ecological harshness cues (e.g., resource scarcity, violence) can modify women's preferences for men's morphology that indicate high-quality genes, such as facial masculinity and body formidability (Garza et al., 2021; Little et al., 2007). In turn, research has also shown that cues of safety can drive women's preferences for men with high-quality features (Little et al., 2007; Marcinkowska et al., 2018). We predicted that ecological harshness cues would modulate women's perceptions of men's height and SHR. Additionally, we investigated individual differences in mating strategies (i.e., sociosexuality) and mate value in women's perceptions of men. Mating strategies and mate value have been shown to moderate preferences for men with upper body strength (Garza & Byrd-Craven, 2021; Garza et al., 2021; Little et al., 2001). Therefore, in the current study, we used individual differences measures in mating strategies (i.e., SOI-R; Penke & Assendorpf, 2008) and mate value (i.e., Mate Value Inventory; Edlund & Sagarin, 2014) to assess women's preferences for men's SHR and height. We predicted that women's sociosexuality and mate value would positively predict women's perceptions of men's attractiveness, masculinity, dominance, and fighting ability in relation to their height and SHR.

Method

Participants

Participants were two-hundred and forty-seven self-identified heterosexual women ($M = 24.46$, $SD = 5.56$) from a predominantly Hispanic serving institution. The sample demographics were Hispanic ($N = 235$), White ($N = 8$), Asian-American ($N = 1$), African-American ($N = 1$), Native-American ($N = 1$), and Other ($N = 1$).

Materials

Ecological Harshness Cues The ecological harshness cues used were prompts and images that connote information about resource safety (Little, 2007), resource scarcity, and

violence (Hill et al., 2013). The safe cue was a reading prompt, while the resource scarcity and violence condition were slideshows used in previous research on ecological harshness and behavior (Garza et al., 2021; Griskevicius, et al., 2011; Hill et al., 2013). In the safe prompt, participants read a paragraph (127 words) including information that their lives are stable and of good financial prospects. The resource scarce condition (7 slides) included a slideshow depicting a failing economy, poor job prospects, and information about an unpredictable future. The violent condition (7 slides) included a slideshow about gang violence, homicides, and living life in a dangerous twenty-first century.

Sociosexual Orientation Inventory-Revised (SOI-R) The revised Sociosexual Orientation Inventory (SOI-R; Penke & Assendorpf, 2008) is a measure of individual differences in one's willingness to engage in uncommitted sexual encounters. It is a 9-item measure, where higher scores are indicative of being in favor of uncommitted sexual encounters while lower scores are indicative of being in favor of more restrictive sexual encounters. The SOI-R includes 3 subscales that measure domains in reference to behavior, desire, and attitude. Sample items on the scale include measures of behavior, such as, "With how many partners have you had sex with in the past 12 months," where response options varied from "1 = 0" to "9 = 20 or more;" attitude measures, such as, "Sex without love is OK," where response options varied from "1 = strongly disagree" to "9 = strongly agree;" and desire measures, such as, "How often do you have fantasies about having sex with someone you are not in a committed romantic relationship with?, where response options varied from "1 = never" to "9 = at least once a day." For the purpose of this study, we used the global measure of the SOI, which is the average of the entire scale. The SOI-R demonstrated good reliability (α = 0.77).

Mate Value Inventory (MVI) Women's mate value was assessed using the mate value inventory (MVI) (Edlund & Sagarin, 2014), which measures women's responses to their overall attractiveness and mate quality. The MVI is a 4-item instrument that includes the following statements, "Overall, how would you rate your level of desirability as a partner on the following scale?," and "Overall, how would members of the opposite sex rate your level of desirability as a partner on the following scale?," where response options varied from "1 = extremely undesirable" to "7 = extremely desirable." For the 3rd item, "Overall, how do you believe you compare to other people in desirability as a partner on the following scale," response options varied from "1 = very much lower than average" to "7 = very much higher than average." For the last item, "Overall, how good of a catch are you?," response options varied from "1 = very bad catch" to "7 = very good catch." Higher scores on the MVI are indicative of women expressing a higher mate value while lower scores are indicative of women expressing a lower mate value. The composite score of the 4 items was used to indicate a mate value index. The MVI demonstrated good reliability (α = 0.74).

Stimuli The stimuli used were adopted from Pazhoohi et al. (2023a). They comprised of white male stimuli varying in SHR (small (1.1), intermediate (1.2), and high (1.3)) created in the Daz3D program. Each of the three male stimuli had 7 variations in height which differed by 5 cm each (160 cm, 165 cm, 170 cm, 175 cm, 180 cm, 185 cm, 190 cm). This resulted in a total of 21 male images. The images were positioned on a height chart which ranged from 100 to 190 cm and were positioned on the left side of a white female stimulus who was anchored in all of the images at 172 cm (Fig. 1). The female was anchored at 172 cm to be somewhere in between the range of men's height of 170 to 175 cm, which encompasses the average height of men in the USA (e.g., 173 cm; Fryar et al., 2021). The images were in color and were forward facing.

Procedure

Participants signed up for the approved study (#2022–02-16) on the university's SONA system for participant recruitment. They were then directed to an online Qualtrics link where they completed demographic questions, the SOI-R, and MVI. They were then randomly assigned to either the safe, resource scarce, or violent condition. Once participants read the information from the condition, they viewed 21 images presented in random order. After viewing each image, participants rated the image for the following: "How attractive do you find this man?," "How masculine do you find this man?," and "If this man was involved in a physical confrontation, how successful would he be?" using a 7-point Likert scale, where response options varied from "1 = not at all" to "7 = very."

Manipulation Check

To determine the effectiveness of the manipulation of ecological conditions, a between-subjects ANOVA was run on participant's responses to the following: (1) How much did this make you feel that the world is becoming more violent? (2) How much did this make you feel that you are becoming the victim of a crime? (3) How much did this make you feel emotionally aroused? and (4) To what extent did this make you feel that the world is becoming uncertain? Each question was answered on a "1 = not very much" to "7 = very much" Likert scale. Table 1 presents the overall means and *F*-tests

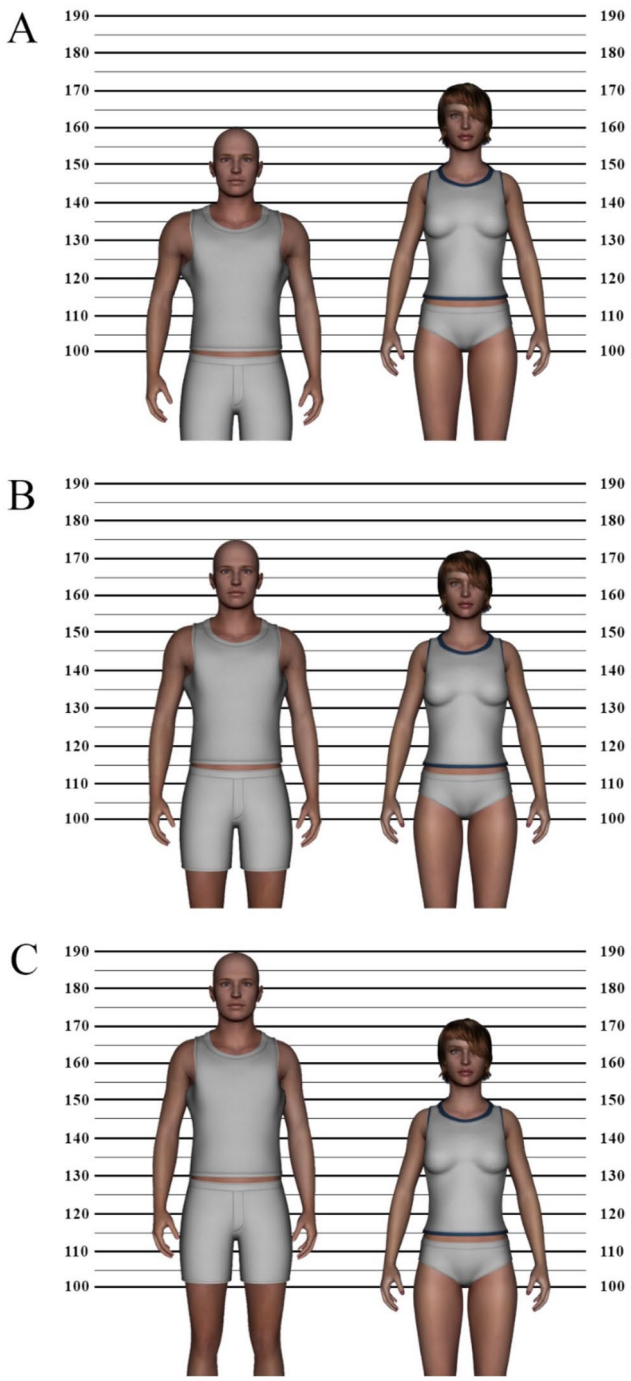

Fig. 1 Examples of the stimuli. **A** A male stimulus with a height of 160 cm and large SHR. **B** A male stimulus with a height of 175 and intermediate SHR. **C** A male with a height of 190 cm and small SHR. In all stimulus presentations, the same female is anchored at 172 cm while the range for the male's height varied between 160 and 190 cm

for the manipulation. Participants indicated that they felt the world was becoming more violent, uncertain, and being a victim of a crime when exposed to the violent and resource scarce conditions compared to the safe. The violent and resource scarce conditions were not significantly different from each other. For the world becoming more violent, the conditions were not different from each other.

Data analyses

Analysis 1 To examine the conditional effects of ecology across perceptions of men's SHR and height, data were analyzed using a 3(ecological condition: safe, resource scarce, violent) × 3(SHR: low, intermediate, high) × 7(height: 160 cm, 165 cm, 170 cm, 175 cm, 180 cm, 185 cm, 190 cm) mixed ANOVA with ecological condition as a between-subjects factor and height and SHR as within-subjects factors. All mixed ANOVAs used a Greenhouse–Geisser correction, and all post-hoc comparisons were conducted using a Bonferroni correction.

Analysis 2 To investigate the moderating role of women's mate value and sociosexuality, a linear-mixed effect model was conducted with height, SHR, mate value, and sociosexuality as fixed effects, and participants (Subject ID) as a random factor. The dependent variables in all analyses were attractiveness, masculinity, dominance, and fighting ability. The categorical variables for height and SHR were dummy-coded so that the lowest value (e.g., 160 cm, Small SHR) served as the reference category. All continuous variables (sociosexuality and mate value) were mean-centered. For any significant main effects or interactions, the unstandardized beta is reported.

Results

Attractiveness

There was a significant main effect of men's height on women's attractiveness ratings, $F(2.23, 521.47) = 249.24$, $p < .001$, $\eta^2_p = .51$, and SHR, $F(1.89, 461.06) = 19.26$, $p < .001$, $\eta^2_p = .07$. Women rated men as more attractive as height increased and all comparisons among height were significant (all ps $< .001$). Women rated larger SHRs ($M = 3.27$, $SE = .08$) as more attractive compared to smaller SHRs ($M = 3.08$, $SE = .08$), but ratings for larger SHRs were not significantly different compared to intermediate SHRs ($M = 3.14$, $SE = .08$). Smaller SHRs were not significantly different compared to intermediate SHRs ($p = .14$). The results were further qualified by a significant height by SHR interaction, $F(9.95, 2430.01) = 2.91$, $p < .001$, $\eta^2_p = .02$ (Fig. 2). At 165 cm, women rated larger SHRs as more attractive compared to intermediate but not smaller SHRs. For heights 180–190 cm, larger SHRs were rated as more attractive compared to intermediate and smaller SHRs. The main effect for ecology, $F(2, 244) = .44$, $p = .64$, $\eta^2_p = .005$, and interactions between ecology and height, $F(12,$

Table 1 Between-subjects ANOVA for the manipulation check on ecological harshness cues

	Safe	Resource scarce	Violent	*F*	*p*	η^2_p
World becoming violent	3.90	5.00	5.81	31.80	< .001	.14
Victim of a crime	2.76	4.08	4.58	31.00	< .001	.14
Aroused	3.04	3.46	3.42	1.84	.16	.01
Uncertain	3.51	5.22	4.80	26.70	< .001	.13

1110) = .94, p = .39, η^2_p = .008; ecology and SHR, F(3.77, 461.06) = 1.54, p = .18, η^2_p = .01; and ecology, height, and SHR, F(19.91, 2430.01) = 1.06, p = .37, η^2_p = .009, were not significant.

Masculinity

There was a significant effect of men's height on women's masculinity ratings, F(2.15, 1110) = 255.13, p < .001, η^2_p = .51, and SHR, F(1.84, 449.73) = 56.43, p < .001, η^2_p = .19. Women rated men as more masculine as height increased and all comparisons among height were significant (all ps < .001). Ratings for masculinity were also significant across all SHR comparisons (all ps < .001). The interaction between height and SHR was significant, F(10.86, 2651.92) = 4.28, p < .001, η^2_p = .02 (Fig. 3). For heights 165 cm, 180 cm, and 190 cm, women rated larger SHRs as more masculine compared to intermediate and smaller SHRs. For 170 cm of height, women rated larger SHRs as more masculine compared to smaller SHRs, but ratings were not significantly different compared to intermediate SHRs. For the average height of 175 cm, larger SHRs were rated as more masculine compared to intermediate SHRs but not different than smaller SHRs. The main effect for ecology, F(2, 244) = .42 p = .65, η^2_p = .003, was not significant, and the interaction between ecology and height, F(4.30, 524.64) = 1.18, p = .31, η^2_p = .01, and ecology, height, and SHR, F(21.73, 2651.92) = 1.34, p = .13, η^2_p = .01, were not significant. There was a significant interaction between ecology and SHR, F(3.68, 449.73) = 3.00, p = .02, η^2_p = .02 (Fig. 4). Across all ecological conditions, smaller SHRs compared to intermediate SHRs were not significant (all ps > .05). Differences between smaller and larger SHRs were significant across all ecologies, while differences between intermediate and larger SHRs were only significant in the safe and resource scarce ecologies (Fig. 4).

Dominance

There was a significant main effect of men's height on women's dominance ratings, F(2.12, 518.30) = 318.50, p < .001, η^2_p = .57, and SHR, F(1.84, 451.13) = 48.57, p < .001, η^2_p = .17. Women rated men more dominant as height increased, and the comparisons among height were all significant (all ps < .001). For SHR, women's perceptions of dominance increased as a function of SHR, and significant differences were noted across all comparisons (all ps < .05). There was a significant interaction between height and SHR, F(10.87, 2652.26) = 3.10, p < .001, η^2_p = .01 (Fig. 5). For heights 165 cm, 180 cm, 185 cm, and 190 cm, larger SHRs were rated as more dominant compared to intermediate and smaller SHRs, while for heights 160 cm and 170 cm, larger SHRs were rated as more dominant compared to smaller SHRs but not for intermediate SHRs. For the average height of 170 cm, larger SHRs were rated as more dominant compared to intermediate SHRs but not smaller SHRs. The

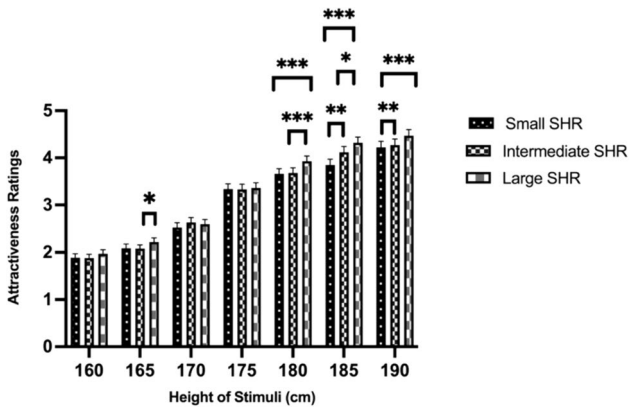

Fig. 2 Women's mean ratings of men's attractiveness as a function of height and SHR. Note: *p < .05, **p < .01, ***p < .001

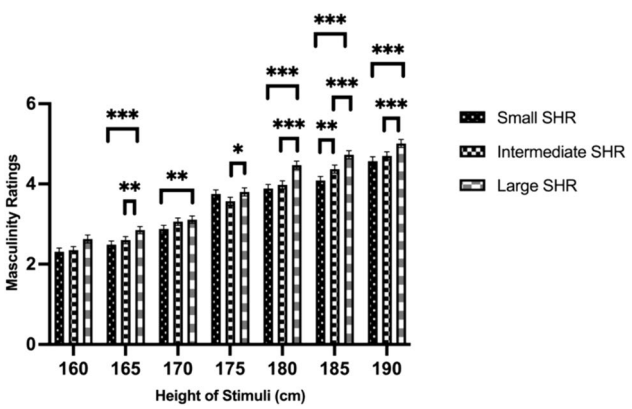

Fig. 3 Women's mean ratings of men's masculinity as a function of height and SHR. Note: *p < .05, **p < .01, ***p < .001

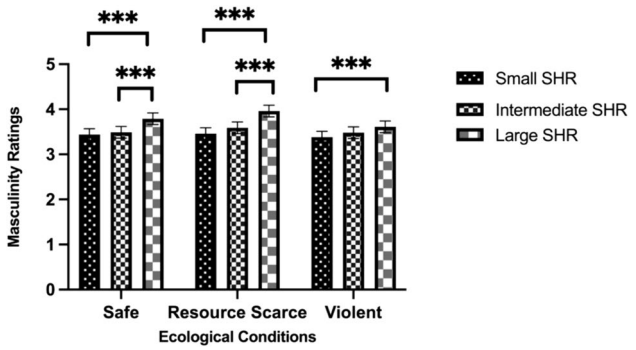

Fig. 4 Women's mean ratings of men's masculinity as a function of ecological condition and SHR. Note: *$p < .05$, **$p < .01$, ***$p < .001$

main effect for ecology, $F(2, 244) = .55$, $p = .58$, $\eta^2_p = .004$, and the interactions between ecology and height, $F(4.24, 518.30) = 1.35$, $p = .24$, $\eta^2_p = .01$, and ecology, height, and SHR, $F(21.74, 2652.26) = 1.30$, $p = .15$, $\eta^2_p = .01$, were not significant. There was a marginal effect for ecology and SHR, $F(3.69, 451.13) = 2.35$, $p = .06$, $\eta^2_p = .02$. There was a trend for larger SHRs to be rated higher on dominance when primed with a resource scarce environment.

Fighting Ability

There was a significant main effect of men's height on women's fighting ability ratings, $F(2.23, 554.83) = 338.50$, $p < .001$, $\eta^2_p = .58$, and SHR, $F(1.90, 465.48) = 49.05$, $p < .001$, $\eta^2_p = .17$. Women's perceptions of men's fighting ability increased as a function of height and all comparisons were significant (all $ps < .001$). Women's perceptions for fighting ability increased as a function of SHR and all comparisons were significant (all $ps < .05$). Moreover, there was a significant interaction between height and SHR, $F(10.86, 2656.09) = 3.46$, $p < .001$, $\eta^2_p = 01$ (Fig. 6). Across all heights, larger SHRs were rated as higher on fighting

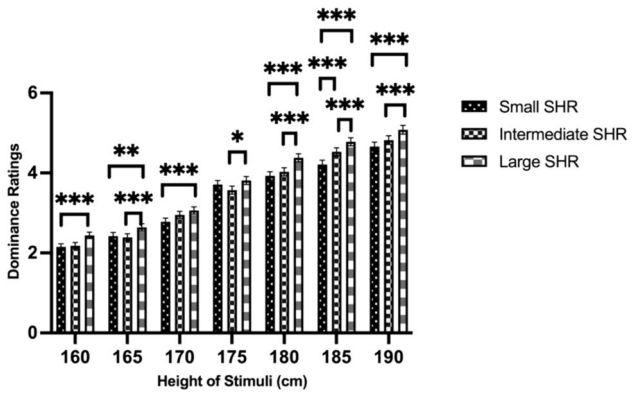

Fig. 5 Women's mean ratings of men's dominance as a function of height and SHR. Note: *$p < .05$, **$p < .01$, ***$p < .001$

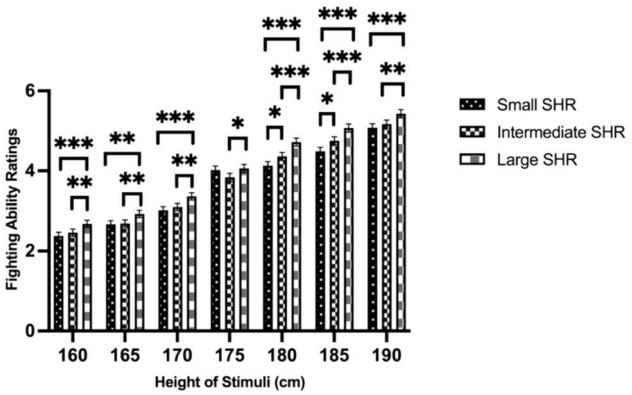

Fig. 6 Women's mean ratings of men's fighting ability as a function of Height and SHR. Note: *$p < .05$, **$p < .01$, ***$p < .001$

ability compared to intermediate and smaller SHRs, with the exception of the average height of 175 cm, where differences were only significant for larger SHRs compared to intermediate but not smaller SHRs. The main effect for ecology, $F(2, 244) = .20$, $p = .81$, $\eta^2_p = .002$, and interactions between ecology and height, $F(4.46, 544.83) = 1.80$, $p = .11$, $\eta^2_p = .02$, and ecology, SHR, and height, $F(21.77, 2656.09) = 1.14$, $p = .29$, $\eta^2_p = .009$, were not significant. There was a marginal effect for ecology and SHR, $F(3.81, 465.48) = 2.36$, $p = .06$, $\eta^2_p = .02$. There was a trend for larger SHRs to be rated higher on fighting ability when primed with a resource scarce environment.

Individual Differences in Sociosexuality and Mate Value in Women's Perceptions

Linear mixed effects models (LME) were run to moderate the relationship between the sociosexuality and mate value across ratings of attractiveness, masculinity, dominance, and fighting ability. Height, SHR, sociosexuality, and mate value were entered as fixed effects, while participants were entered as a random factor. The LME model showed that sociosexuality was not associated with perceptions of attractiveness, $F(1, 247.99) = .37$, $p = .54$; masculinity, $F(1, 248) = .009$, $p = .92$; dominance, $F(1, 247.99) = .0005$, $p = .98$; or fighting ability, $F(1, 247.97) = .66$, $p = .42$, nor did it moderate perceptions in reference to height and SHR (all $ps > .05$). Further, the model showed that mate value did not moderate perceptions of attractiveness, $F(2, 4959) = 1.45$, $p = .23$; masculinity, $F(2, 4959) = .70$, $p = .49$; dominance, $F(2, 4959) = .45$, $p = .63$; and fighting ability, $F(2, 4959) = .53$, $p = .58$, as a function of SHR.

There was a significant interaction between mate value and Height, $F(6, 4958.99) = 8.99$, $p < .001$ (Fig. 7). Women with higher mate value were more likely to rate men with a height of 190 cm ($b = .24$, $SE = .05$, 95% CI [.13, .34], $p < .001$), 185 cm ($b = 0.25$, $SE = .05$, 95% CI [.15, .35],

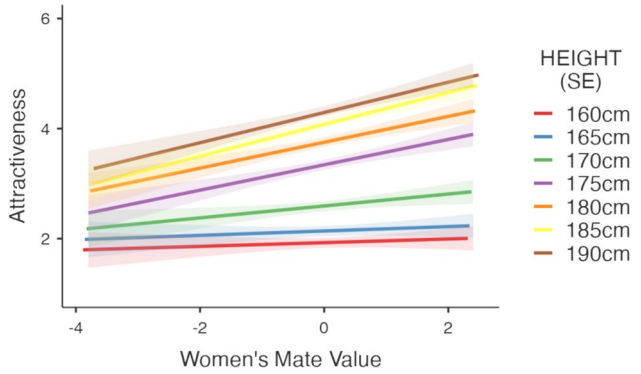

Fig. 7 Women's self-reported mate value moderates perceptions of attractiveness across men's height. (SE) denotes the standard error

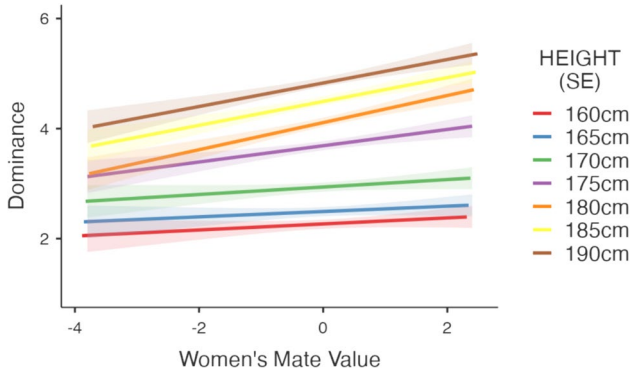

Fig. 9 Women's self-reported mate value moderates perceptions of dominance across men's height. (SE) denotes the standard error

$p < .001$), 180 cm ($b = .20$, $SE = .05$, 95% CI [.10, .30], $p < .001$), and 175 cm ($b = .19$, $SE = .05$, 95% CI [.09, .25], $p < .001$) as more attractive compared to the shortest height, while heights 170 cm ($b = .07$, $SE = 0.05$, 95% CI [−.02, .17], $p = .14$) and 165 cm ($b = .006$, $SE = .05$, 95% CI [−.09, .10], $p = .90$) were not significantly different.

Across perceptions of masculinity, there was a significant interaction for mate value and height, $F(6, 4959.00) = 7.74$, $p < .001$ (Fig. 8). Women with higher mate value were more likely to rate men with a height of 190 cm ($b = .19$, $SE = .05$, 95% CI [.09, .29], $p < .001$), 185 cm ($b = .22$, $SE = .05$, 95% CI [.12, .32], $p < .001$), 180 cm ($b = .20$, $SE = .05$, 95% CI [.10, .21], $p < .001$), and 175 ($b = .12$, $SE = .05$, 95% CI [.02, .22], $p = .01$) as more masculine, while men with a height 170 cm ($b = .03$, $SE = .05$, 95% CI [−.05, 0.13], $p = 0.43$), and 165 cm ($b = -.02$, $SE = .05$, 95% CI [−.10, .09], $p = .96$) were not significantly different.

For ratings of dominance, the interaction between mate value and height was significant, $F(6, 4958.99) = 3.83$, $p < .001$) (Fig. 9). Women with higher mate value considered men with heights of 190 cm ($b = .15$, $SE = .05$, 95% CI [.05, .25], $p = .002$), 185 cm ($b = .16$, $SE = .05$, 95% CI [.06, .26], $p = .001$), and 180 cm ($b = .19$, $SE = .05$, 95% CI [.09, .29], $p < .001$) as more dominant, while heights of 175 ($b = .09$, $SE = .05$, 95% CI [−.006, .19], $p = .06$), 170 ($b = .01$, $SE. = .05$, 95% CI [−.08, 0.11], $p = .79$), and 165 ($b = -.006$, $SE = .05$, 95% CI [−.10, 0.09], $p = .90$) were not significant.

The interaction between mate value and height on perceptions of fighting ability was significant, $F(6, 4958.97) = 4.18$, $p < .001$ (Fig. 10). Women with higher mate value were more likely to rate men with a height of 190 cm ($b = .13$, $SE = .05$, 95% CI [.03, .23], $p = .008$), 185 cm ($b = .15$, $SE = .05$, 95% CI [.05, .26], $p = .002$), and 180 cm ($b = .18$, $SE = .05$, 95% CI [.07, .28], $p < .001$) higher on fighting ability, while heights 175 cm ($b = .10$, $SE = .05$, 95% CI [−.0002, .20], $p = .051$) were marginal, and heights 170 cm ($b = .04$, $SE = .05$, 95% CI [−.05, .14], $p = .36$) and 165 cm ($b = -.002$, $SE = .05$, 95% CI [−.10, .10], $p = .93$) were not significant.

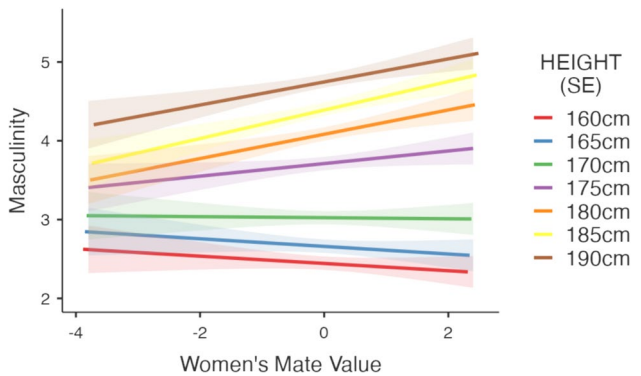

Fig. 8 Women's self-reported mate value moderates perceptions of masculinity across men's height. (SE) denotes the standard error

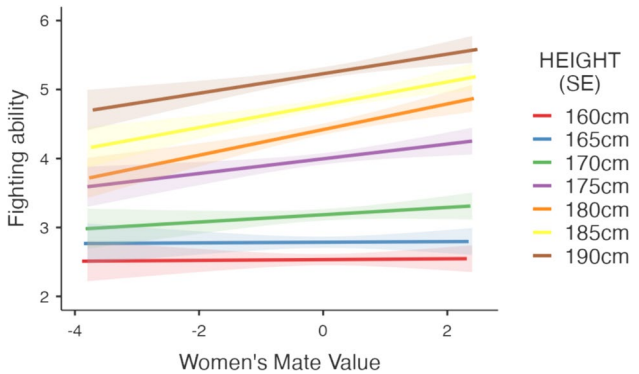

Fig. 10 Women's self-reported mate value moderates perceptions of fighting ability across men's height. (SE) denotes the standard error

Discussion

The current study investigated the role of perceived ecological harshness on women's perceptions of men's attractiveness, masculinity, dominance, and fighting ability. Ecological harshness, in the form of priming participants with cues of safety, resource scarcity, and violence, did not affect women's perceptions of men. However, increases in height and SHR, and their interactive effects, predicted ratings across all outcome variables, with taller men with larger SHRs rated higher overall. Furthermore, we also investigated the possible moderating effects of sociosexuality and mate value in women's perceptions of men. Women's mate value predicted increased ratings for attractiveness, masculinity, dominance, and fighting ability as a function of men's height but not SHR. That is, women who were higher in mate value rated men who were taller than the male average (e.g., 175 cm) as more attractive, masculine, dominant, and higher in fighting ability.

Women's overall preferences for taller men with larger SHRs reflect the importance of morphological traits in men that are associated with high-quality genes. Height has been suggested to be a biological trait important in mate choice (Pawlowski et al., 2017), and research has suggested that height is associated with men's reproductive potential (Mueller & Mazur, 2001; Nettle, 2002; but see Stulp et al., 2012). Women prioritize height as an important feature in men's attractiveness (Salska et al., 2008), and in the current study, we show support for that finding. More importantly, perceptions of morphological traits were linear, with higher ratings given to men who were taller and with broader shoulders (e.g., larger SHR). This replicates previous findings on women's perceptions of men's height and cues of upper body strength (Sell et al., 2017), and the interactive effects of SHR and height on women's overall perceptions of men (Pazhoohi et al., 2023a, b, c). Men who are taller and with larger SHRs may be able to better implement their mating strategy (Pawlowski et al., 2000), and this may be reflected upon their levels of masculinity, dominance, and fighting ability, which are important intrasexual competitive features (Puts et al., 2010).

It was proposed that these preferences may be amplified by priming ecological harshness, as research has suggested that resource scarcity (Little et al., 2007; Pereira et al., 2020), violence (Little et al., 2013; Reeve et al., 2019; Li et al., 2014), and income inequality (Brooks et al., 2011) may drive women's preferences for men with masculine physical features. In the current study, we did not find evidence that ecological priming moderated women's preferences. One explanation could be that taller men with larger SHRs tend to be preferred across all ecological condition, as they may provide a partner with many benefits across any situation. Other studies have shown that ecological priming may not result in differences in mate preferences (Dixson et al., 2017; Lee & Zietsch, 2015; McIntosh et al., 2017; Tybur et al., 2022) and may actually drive preferences for men with feminine physical features (Pereira et al., 2020). Men with physical morphology that connotes parental investment (e.g., physical femininity) may compete less intrasexually and channel their investment to their offspring which would benefit their survivability (Lee & Zietsch, 2011; Lee et al., 2013) However, other studies have shown that sexually dimorphic traits, such as men's beardedness, is preferred among women with children (Dixson et al., 2019) and judge those men higher on fathering ability (Dixson et al., 2013). In our study, ecological priming only resulted in differences in the perception of masculinity across SHR. Women rated larger SHRs as more masculine for the safe and resource scarce condition, and the differences were significant across all SHRs. For the violent condition, the larger SHR was only different compared to the smaller SHR. Women may be more sensitive to small changes in SHR in a safe and resource scarce environment, while larger differences in SHR are needed to captivate some attention when primed with violent cues. This finding warrants further research on women's preference for men's upper body size as a function of ecological differences.

Individual differences in dispositional levels of mate value, but not sociosexuality, moderated women's perceptions of men's attractiveness, masculinity, dominance, and fighting ability. Women calibrate their mate preferences for men with ideal traits as a function of their own self-perceived attractiveness or mate value (Gangestad & Simpson, 2000). Women higher in mate value may want all the desirable characteristics in a potential mate, such as matching with a partner with similar levels of attractiveness (Buss & Shackelford, 2008). Other studies have shown that women who perceive themselves higher on attractiveness prefer men with masculine facial (Chen et al., 2018; Garza et al., 2023; Little et al., 2001, but see Clarkson et al., 2020) and vocal characteristics (O'Conner et al., 2012). The findings of the current study support the relevant literature on mate value's association with preferences for men with masculine features and extend the literature by also considering body morphology in the form of SHR and height. Previous studies have pointed to the role of women's mate value and their preferences via visual attention to men with upper body mass (Garza & Byrd-Craven., 2021). In the current study, we add the novel finding of women higher in mate value preferring taller men. Interestingly, this finding did not extend to all increases in men's height, but it was only in relation to men who were taller than the woman used as an anchor in the stimuli presented. This might suggest that women with higher mate value calibrate their preferences specifically to men who are taller than them (if participants assumed the anchoring female as themselves), and not necessarily to increasing levels of height. Yet to test

this hypothesis, further research is needed to discern if the participants have considered themselves as the same height of the female stimulus, or how a different anchor height might influence participants' preferences.

The study could be further improved upon by introducing an additional measure of ecological harshness, such as measuring differences in socioeconomic status and perceived resource availability. Although the main goal of the study was to measure context-dependent cues on perceptions of men, some research has suggested that information about income inequality can influence ratings of men's attractiveness (Brooks et al., 2011). Further, women may also be influenced by the overall earning potential of a potential partner that may override perceptions of physical attractiveness (Wang et al., 2018). Considering women's earning potential and possibly the earning potential of the men being rated could be a fruitful avenue of research considering that women were primed with cues of economic stability/instability. Additionally, we only considered perceptions across ecological priming conditions and did not utilize a mating context paradigm, which may have provided insight into preferring a partner across a short- or long-term mating context. The reliance on the sociosexuality inventory may have limited the study in addressing perceptions across mating context by only considering individual differences in short-term mating. Importantly, we used a sample of Hispanic women to increase diversity in the field of evolutionary psychology, as Latin-American populations are greatly underrepresented (Pollet & Saxton, 2019). Increasing diversity of samples in the field is important in getting a better understanding of evolved preferences across populations; however, it is important to note that the findings with Hispanic women largely replicated existing literature on mate preferences using Caucasian women. Lastly, the study can be further improved by incorporating more stimuli composites, rather than relying on the colored set of images, such as the different stimuli presentations used in Pazhoohi et al. (2023a), and by diversifying the ethnicity of the stimuli presented.

Conclusion

The current study investigated women's perceptions of men's SHRs and height across ecological context that primed safety, scarcity, and violence. Women were more likely to consider taller, broad-shouldered (larger SHRs) men as more attractive, masculine, dominant, and higher on fighting ability. These perceptions were moderated by individual differences in women's mate value but not sociosexuality, suggesting that women may calibrate their perceptions of men as a function of their self-perceived attractiveness.

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Author Contribution All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Ray Garza and Regina Gonzalez Elizondo. The first draft of the manuscript was written by Ray Garza, Regina Gonzalez Elizondo, and Farid Pazhoohi, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data Availability The data is available upon request.

Code Availability The data was analyzed using SPSS and Jamovi program. The file is available upon request.

Declarations

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board at Texas A&M International University (#2022–02-16).

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication The authors affirm that human research participants provided informed consent for the publication of the images in Figs. 2–10.

Competing Interests The authors declare no competing interests.

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