We conducted six studies investigating how fWHR provides a veridical cue to parental ability while considering domains related to protection and nurturance. Study 1 investigated how these features influence perceptions of how effective men are in these domains, with Study 2 demonstrating the degree to which these inferences are rooted in configural processing. We additionally assessed perceptions of competing motivational states in these targets (Study 3). Two further studies sought to identify boundary conditions of this effect by considering interactive effects with racial stereotypes (Study 4) and whether these inferences extend to women (Study 5). Finally, we assessed whether individual differences in parental motives influenced acuity toward these features (Study 6). We report all measures, manipulations, and exclusions herein. In all studies, we did not analyze data until we completed data collection over the allotted period of data collection. Materials, data, and syntax are available at: <https://osf.io/hc32s/?view_only=32db53207cb145e0825abe3b4f3a2a37>

**Study 1**

**Method**

**Participants.** We recruited 101 undergraduates from a private university in Northeast U.S. in exchange for course credit (76 women, 25 men; *MAge*=20.80, *SD*=5.26; 49% White). Sensitivity analyses indicated we were sufficiently powered to detect small effects (Cohen’s *f*=0.10, 1-β=0.80).

**Materials and Procedure**

**Target Faces*.*** Participants evaluated 20 color images of neutrally expressive Caucasian male faces from the Chicago Faces Database (Ma, Correll, & Wittenbrink, 2015). Norming of stimuli demonstrated substantial differences in fWHR between high- and low-fWHR faces Database naturally varying in fWHR, with 10 possessing the highest fWHR in the set and 10 possessing the lowest (Deska & Hugenberg, 2018).

**Parenting Efficacy.** We tasked participants with responding to two face-valid 7-point scales assessing the extent these targets were perceived as effective in nurturing their children and protecting them from harm (1=*Not at All*; 7=*Very Much*). Items were placed below each target with participants having as much time to evaluate each face as they would like.

**Results**

We conducted a 2 (Participant Sex: Male vs. Female) × 2 (Target fWHR: High vs. Low) × 2 (Parenting Role: Protection vs. Nurturance) mixed-model ANOVA with repeated factors over the latter two factors. A Target fWHR main effect indicated high-fWHR targets were perceived as more effective parents (*M*=4.06, *SD*=1.04) than low-fWHR targets (M=3.88, SD=0.99), *F*(1, 99)=9.31, *p*=0.003, *ηp²*=0.086. A Parenting Role main effect indicated that targets were perceived as more effective in protecting their offspring (*M*=4.03, *SD*=1.03) than nurturing them (*M*=3.91, *SD*=0.99), *F*(1, 99)=5.77, *p*=0.018, *ηp²*=0.055. No main effect of Participant Sex emerged, *F*(1, 99)=1.25, *p*=0.265, *ηp²*=0.013.

Effects were qualified by the predicted Target fWHR × Parenting Role interaction, *F*(1, 99)=49.50, *p*<0.001, *ηp²*=0.333 (see Figure 1). Simple effects tests indicated high-fWHR targets were perceived as more effective at protecting their offspring (*M*=4.23, *SD*=1.07) than were low-fWHR targets (*M*=3.84, *SD*=0.99), *F*(1, 99)=35.01, *p*<0.001, *ηp²*=0.261. No difference emerged in perceptions of high- (*M*=3.89, *SD*=1.01) and low-fWHR targets (*M*=3.93, *SD*=0.98) in being nurturing, *F*(1, 99)=0.55, *p*=0.460, *ηp²*=0.006. Viewed another way, high-fWHR targets were perceived as more effective in protecting offspring than nurturing them, *F*(1, 99)=28.40, *p*<0.001, *ηp²*=0.223. No difference emerged for the different roles for low-fWHR targets, *F*(1, 99)=2.42, *p*=0.123, *ηp²*=0.024.

**Study 2**

**Method**

**Participants.** We recruited 194 participants from public university in Southeastern U.S. for course credit in a single wave of data collection (153 women, 41 men; *MAge*=20.54, *SD*=3.12; 52.6% White). A sensitivity analysis indicated 194 participants would sufficiently detect small effects (*f*=0.07, 1-β=0.80).

**Materials and Procedure.** Participants responded to the pair of items for each from Study 1 to evaluate these targets in a similar capacity. Critically, half of the trials presented the faces upright with the other half presenting them inverted.

**Results**

We conducted a 2 (Participant Sex: Male vs. Female) × 2 (Target fWHR: High vs. Low) × 2 (Parenting Role: Protection vs. Nurturance) × 2 (Target Presentation: Upright vs. Inverted) mixed-model ANOVA with repeated factors over the latter three factors. A main effect of Parenting Role indicated targets were perceived as more effective at protective roles (M=4.00, SD=0.99) than nurturing roles (*M*=3.84, *SD*=0.92), *F*(1, 192)=7.29, *p*=0.008, *ηp²*=0.037. Another main effect of Target Presentation indicated participants inferred more parenting ability in inverted faces (*M*=4.10, *SD*=0.94) than upright faces (*M*=3.74, *SD*=0.97), *F*(1, 204)=63.50, *p*<0.001, *ηp²*=0.249. Another main effect of Participant Sex indicated women evaluated the targets as more effective parents (*M*=3.99, *SD*=0.76) than men (*M*=3.64, *SD*=0.76), *F*(1, 192)=7.07, *p*=0.009, *ηp²*=0.036.

Effects were most superordinately qualified by a Target fWHR × Parenting Role × Target Presentation interaction, *F*(1, 192)=9.00, *p*=0.003, *ηp²*=0.045 (see Figure 2). We decomposed this interaction by conducting simple interactions, separate for upright and inverted faces (Howell & LaCroix, 2012). For upright faces, effects were qualified by a subordinate Target fWHR × Parenting Role interaction, *F*(1, 192)=70.03, *p*<0.001, *ηp²*=0.267. Simple effects tests indicated low-fWHR targets were perceived as more effective at nurturing (*M*=3.76, *SD*=0.92) compared to high-fWHR targets (*M*=3.48, *SD*=0.96), *F*(1, 192)=12.27, *p*<0.001, *ηp²*=0.060. Conversely, high-fWHR targets were perceived as more effective at protection (*M*=4.00, *SD*=1.05) than low-fWHR targets (*M*=3.72, *SD*=0.99), *F*(1, 192)=19.44, *p*<0.001, *ηp²*=0.092. Viewed another way, high-fWHR targets were perceived as more effective at protection than nurturance, *F*(1, 192)=57.94, *p*<0.001, *ηp²*=0.232. No difference emerged in perceptions of abilities for low-fWHR targets, *F*(1, 192)=1.10, *p*=0.295, *ηp²*=0.006.

A similar 2-way interaction emerged for inverted targets, albeit at a substantially reduced magnitude, *F*(1, 192)=17.01, *p*<0.001, *ηp²*=0.081. Low-fWHR targets were perceived as more effective at nurturing (*M*=4.15, *SD*=0.89) than high-fWHR targets (*M*=3.98, *SD*=0.91), *F*(1, 192)=6.46, *p*=0.012, *ηp²*=0.033. Conversely, the difference between perceptions of high-fWHR targets as more effective at protection (*M*=4.22, *SD*=0.97) and low-fWHR targets (*M*=4.06, *SD*=0.95) was not conventionally significant, *F*(1, 192)=3.46, *p*=0.064, *ηp²*=0.018. Viewed another way, high-fWHR targets were perceived as more effective at protection compared to nurturance, *F*(1, 192)=7.55, *p*=0.007, *ηp²*=0.038. Low-fWHR targets were perceived as more effective in nurturance than protection, *F*(1, 192)=4.15, *p*=0.043, *ηp²*=0.021. No other main effects or superordinate interactions emerged, *F*s<2.46, *p*s>0.118.

**Study 3**

**Method**

**Participants.** We recruited 207 undergraduates from a private university in Northeastern U.S. for course credit in a single wave of data collection. We excluded one participant from final analyses for reporting being neither male nor female, given our interest in identifying potential sex differences (155 women, 51 men; *MAge*=19.61, *SD*=1.94; 40% White). Sensitivity analyses indicated we were sufficiently powered to detect small effects (Cohen’s *f*=0.09, 1-β=0.80).

**Materials and Procedure.**

***Parenting Motives.*** Participants completed a modified version of the Abbreviated Parental Care and Nurturance Scale (PCAT-pn), a scale developed to assess individual differences in parenting motives along dimensions of protection and nurturance (Hofer, Buckels, White, Beall, & Schaller, 2018). We modified the wording of items to assess how each target appeared to typify both motives, with 4 items assessing protection (e.g., “This person would hurt anyone who was a threat to a child”) and 6 assessing nurturance (“If this person were to see an infant, they would want to hold”). Items demonstrated strong reliability across stimulus level and subscale (αs>0.93).

***Perceived Mating Interest.*** We assessed targets’ perceived mating interest using a pair of face-valid items tasking participants with indicating the extent to which they perceived the targets as being interested in LTM or STM (Brown, Keefer, Sacco, & Brown, in press).

Consenting participants viewed each face in a randomized order and evaluated their parenting motivation, and contextual mating preferences. Participants further indicated how dominant they perceived each target as being using a single, face-valid item (1=*Not at All*; 7=*Very Much*). All items operated along the same anchors. This was followed by demographics and debriefing.

**Results**

**Perceived Dominance.** Participants perceived high-fWHR targets as more dominant (*M*=4.09, *SD*=0.92) than low-fWHR targets (*M*=3.53, *SD*=0.84), *t*(205)=11.27, *p*<0.001, *d*=0.78.

**Parenting Motives.** We conducted a 2 (Participant Sex: Male vs. Female) × 2 (Target fWHR: High vs. Low) × 2 (Target Motive: Protection vs. Nurturance) mixed-model ANOVA with repeated factors over the latter two factors. A main effect of Target fWHR indicated that low-fWHR parents appeared more parentally motivated (*M*=3.43, *SD*=0.94) than high-fWHR targets (*M*=3.31, *SD*=1.02), *F*(1, 204)=4.20, *p*=0.042, *ηp²*=0.020. Another main effect of Target Motives indicated that targets appeared more driven by protection motives (*M*=3.45, *SD*=0.98) than care motives (*M*=3.29, *SD*=0.98), *F*(1, 204)=9.01, *p*=0.003, *ηp²*=0.042. An additional main effect of Participant Sex indicated that men perceived the targets as more parentally motivated (*M*=3.70, *SD*=1.08) than did women (*M*=3.26, *SD*=0.93), *F*(1, 204)=10.39, *p*=0.001, *ηp²*=0.048.

As predicted, effects were qualified by a Target fWHR × Target Motive interaction, *F*(1, 204)=55.91, *p*<0.001, *ηp²*=0.215. Simple effects tests indicate that high-fWHR targets are perceived as more driven by protection motives (*M*=3.51, *SD*=1.04) than nurturance motives (*M*=3.11, *SD*=1.01), *F*(1, 204)=32.88, *p*<0.001, *ηp²*=0.139. No difference emerged in perceptions of low-fWHR targets’ protection (*M*=3.40, *SD*=0.92) and nurturance motives (*M*=3.47, *SD*=0.96), *F*(1, 204)=1.17, *p*=0.280, *ηp²*=0.006. Viewed another way, high-fWHR targets were perceived as more driven by protection motives than low-fWHR targets, *F*(1, 204)=4.94, *p*=0.027, *ηp²*=0.024. Conversely, low-fWHR targets were perceived as more driven by nurturance motives than were high-fWHR targets *F*(1, 204)=31.69, *p*<0.001, *ηp²*=0.134 (see Figure 3). No other main effects or interactions emerged, *F*s<2.59, *p*s>0.111.

**Mating Interest.** We conducted a 2 (Participant Sex: Male vs. Female) × 2 (Target fWHR: High-fWHR vs. Low-fWHR) × 2 (Context: STM vs. LTM) mixed-model ANOVA with repeated factors over the latter two factors. Effects were most superordinately qualified by a Target fWHR × Context interaction, *F*(1, 204)=16.37, *p*<0.001, *ηp²*=0.074. Simple effects tests indicated participants perceived high-fWHR targets as more interested in STM (*M*=3.89, *SD*=1.01) than low-fWHR targets (*M*=3.77, *SD*=0.96), *F*(1, 204)=6.05, *p*=0.015, *ηp²*=0.029. Conversely, low-fWHR targets were perceived as more interested in LTM (*M*=4.08, *SD*=0.85) than high-STM targets (*M*=3.82, *SD*=0.83), *F*(1, 204)=18.00, *p*<0.001, *ηp²*=0.081. Viewed another way, high-fWHR targets appeared similarly interested in STM and LTM, *F*(1, 204)=0.34, *p*=0.562, *ηp²*=0.002. Low-fWHR targets appeared more interested in LTM than STM, *F*(1, 204)=12.60, *p*<0.001, *ηp²*=0.058 (see Figure 4). No main effects or other superordinate interactions emerged, *F*s<3.10, *p*s>0.080.

**Study 4**

**Method**

**Participants.** We recruited 151 participants from a public university in Southeastern U.S. in exchange for course credits. Two participants were excluded from final analyses; one reported being neither male nor female and another completing the study in under 90 seconds, suggesting non-conscientious responding (*n*=149; 106 women, 43 men; *MAge*=18.69, *SD*=1.11; 86.6% White). Sensitivity analyses indicated we could detect small effects with 138 participants (*f*=0.25, 1-β=0.80).

**Materials and Procedures.** Consenting participants engaged in the same task as described in Study 1 by evaluating high- and low-fWHR targets in their perceived parenting ability in protection and nurturance domains. However, participants evaluated either White (*n*=75) or Black male targets (*n*=74) on a between-subjects basis. This methodological decision was to reduce concerns of demand characteristics given differing racial stereotypes that could be activated during within-subjects comparisons (Christiansen, 2012). The Black targets were also chosen from the Chicago Faces Database (Ma et al., 2015) and varied in naturally occurring fWHR like their White counterparts in the previous studies, with previous work demonstrating formidability in Black targets to have similar signal values to White targets (Deska, Lloyd, & Hugenberg, 2018b).

**Results**

We conducted a 2 (Participant Sex: Male vs. Female) × 2 (Condition: White vs. Black Targets) × 2 (Target fWHR: High vs. Low) × 2 (Parenting Role: Protection vs. Nurturance) mixed-model ANOVA with repeated factors over the latter two factors. A Condition main effect indicated participants perceived the Black targets as more effective fathers (*M*=5.07, *SD*=0.97) than White targets (*M*=3.76, *SD*=0.95), *F*(1, 145)=69.92, *p*<0.001, *ηp²*=0.325. A Target fWHR main effect further indicated low-fWHR targets (*M*=4.46, *SD*=1.19) were perceived as more effective fathers than high-fWHR targets (*M*=4.36, *SD*=1.15), *F*(1, 145)=4.70, *p*=0.032, *ηp²*=0.031. A Parenting Role main effect indicated targets were perceived as more effective at protection (*M*=4.49, *SD*=1.19) than nurturance (*M*=4.34, *SD*=1.15), *F*(1, 145)=8.04, *p*=0.005, *ηp²*=0.053. No Participant Sex main effect emerged, nor did any interaction with Participant Sex, *F*s<1.55, *p*s>0.236. Effects were most superordinately qualified by a Condition × Target fWHR × Parenting Role interaction, *F*(1, 145)=12.14, *p*=0.001, *ηp²*=0.077 (see Figure 5). We decomposed this interaction with two subordinate analyses for Black and White targets.

**White Targets.** Effects for White targets were qualified by a subordinate 2-way interaction, *F*(1, 74)=44.48, *p*<0.001, *ηp²*=0.375. Simple effects tests indicated that high-fWHR targets were perceived as more effective in protection (*M*=4.02, *SD*=1.01) than low-fWHR targets (*M*=3.60, *SD*=0.89), *F*(1, 74)=29.73, *p*<0.001, *ηp²*=0.287. Conversely, low-fWHR targets were perceived as more effective in nurturance (*M*=3.80, *SD*=0.88) than high-fWHR targets (*M*=3.62, *SD*=1.02), *F*(1, 74)=6.15, *p*=0.015, *ηp²*=0.077. Viewed another way, high-fWHR targets were perceived as more effective in protection than nurturance, *F*(1, 74)=26.17, *p*<0.001, *ηp²*=0.261. Low-fWHR targets were perceived as more effective in nurturance than protection, *F*(1, 74)=8.66, *p*=0.004, *ηp²*=0.105.

**Black Targets.** Effects for Black targets were similarly qualified by their own subordinate 2-way interaction at a reduced magnitude, *F*(1, 73)=14.56, *p*<0.001, *ηp²*=0.166. Simple effects tests indicated that, contrary to hypotheses, low-fWHR targets were perceived as more effective in protection (*M*=5.29, *SD*=0.96) than high-fWHR targets (*M*=5.07, *SD*=0.99), *F*(1, 73)=23.55, *p*<0.001, *ηp²*=0.244. Conversely, and as predicted, low-fWHR targets were perceived as more effective in nurturance (*M*=5.18, *SD*=0.92) than high-fWHR targets (*M*=4.77, *SD*=1.03), *F*(1, 73)=61.06, *p*<0.001, *ηp²*=0.455. Viewed another way, high-fWHR targets were perceived as more effective in protection than nurturance, *F*(1, 74)=22.01, *p*<0.001, *ηp²*=0.232. The difference between perceptions of protection and nurturance was not significant for low-fWHR targets, *F*(1, 73)=3.69, *p*=0.059, *ηp²*=0.048.

**Study 5**

**Method**

**Participants.** We recruited a sample of 132 undergraduates from a public university in Northeastern U.S. in exchange for course credit. One participant was excluded for final analyses for identifying as neither male nor female, given our interest in same- and cross-sex perceptions. This resulted in a final sample of *n*=131 (75 men, 56 women, *MAge*=20.78 years, *SD*=2.73; 39.7% Asian). Sensitivity analyses indicated we were sufficiently powered to detect small effects (Cohen’s *f*=0.12, 1-β=0.80).

**Materials and Procedures.** Consenting participants engaged in similar procedures as Study 1, albeit with the notable exception of a truncated number of target male faces. Specifically, we tasked participants with evaluating high- and low-fWHR male and female faces for a total of 20 trials of five targets in each category. This mirrors procedures from previous work assessing target sex effects of fWHR (i.e., Deska et al., 2018a). Like the male faces employed throughout previous studies, the female faces similarly represented the highest and lowest fWHRs in the database.

**Results**

We submitted our data to a 2 (Participant Sex: Male vs. Female) × 2 (Target Sex: Male vs. Female) × 2 (Target fWHR: High vs. Low) × 2 (Parenting Role: Protection vs. Nurturance) mixed-model ANOVA was repeated factors over the latter three factors. Because of the complexity to this model, we adjusted our alpha for omnibus analyses to α=0.01 to reduce the risk of Type I Error. A Target fWHR indicated low-fWHR targets were perceived as more effective in parenting (*M*=4.15, *SD*=1.06) than high-fWHR targets (*M*=4.04, *SD*=1.18), *F*(1, 129)=4.20, *p*=0.042, *ηp²*=0.032. A Target Sex main effect further indicated female targets were perceived as more effective parents (*M*=4.30, *SD*=1.12) than male targets (*M*=3.89, *SD*=1.12), *F*(1, 129)=52.44, *p*<0.001, *ηp²*=0.289.

Effects were most superordinately qualified by a Target Sex × Target fWHR × Parenting Role interaction, *F*(1, 129)=17.71, *p*<0.001, *ηp²*=0.121. We decomposed this interaction by conducting two simple interactions separated for male and female targets. Effects for male targets were qualified by a subordinate interaction, *F*(1, 129)=35.48, *p*<0.001, *ηp²*=0.216 (see Figure 6). Simple effects tests indicated high-fWHR targets were perceived as more protective (*M*=4.09, *SD*=1.19) than nurturing (*M*=3.65, *SD*=1.15), *F*(1, 129)=47.94, *p*<0.001, *ηp²*=0.271. Conversely, no difference emerged in perceptions of low-fWHR targets’ effectiveness in protection (*M*=3.94, *SD*=1.10) and nurturance (*M*=3.89, *SD*=1.04), *F*(1, 129)=0.95, *p*=0.332, *ηp²*=0.007. Viewed another way, low-fWHR targets were perceived as more nurturing than high-fWHR targets, *F*(1, 129)=12.32, *p*<0.001, *ηp²*=0.087. High-fWHR targets were perceived as descriptively more effective at protection compared to low-fWHR targets, a difference in the same direction as previous studies, *F*(1, 129)=3.78, *p*=0.054, *ηp²*=0.028.

Female targets did not elicit a subordinate interaction and were considered no further, *F*(1, 129)=1.24, *p*=0.267, *ηp²*=0.010. No other main effects or superordinate interactions obtained significance using our adjusted alpha level in this analysis, prompting no further decomposition, *F*s<5.72, *p*s>0.017.

**Study 6**

**Method**

**Participants.** We recruited a sample of 333 undergraduates from a public university in Southeastern U.S. in exchange for course credit. No data were excluded (254 women, 79 men; *MAge*=18.74 years, *SD*=1.92; 82.9% White). Sensitivity analyses indicated we were sufficiently powered to detect small effects (Cohen’s *f*=0.20, 1-β=0.80).

**Materials and Procedure**

**Parenting Motives.** Participants responded to the self-report version of PCAT-pn to indicate their dispositional motivation to provide care for offspring (Hofer et al., 2018). This scale consists of the protection (4 items, α=0.78; *MGrand*=4.03, *SD*=0.70) and nurturance subscales (6 items, α=0.83; *MGrand*=3.98, *SD*=0.80), which operate along 5-point scales with higher scores indicating higher levels of a specific motive. It should be noted all four protection items and two nurturance items had a separate set of scalar anchors (1=*Strongly Disagree*; 5=*Strongly Agree*) from the other four nurturance items assessing the extent to which individuals found a given situation tender (1=*No Tenderness at All*; 5=*A Lot of Tenderness*). Subscales were moderately correlated, prompting us to consider them separately (*r*=0.33, *p*<0.001).

Consenting participants evaluated each the high- (*M*=3.34, *SD*=0.94) and low-fWHR (*M*=3.38, *SD*=0.84) White male targets along a single item assessing general parenting ability (1=*Not at All Effective*; 7=*Very Effective*). This was followed by the PCAT-pn and debriefing.

**Results**

We submitted our data to a 2 (Participant Sex: Male vs. Female) × 2 (Target fWHR: High vs. Low) mixed-model custom ANCOVA with repeated factors over the latter factor. Both subscales of PCAT-pn were employed as custom covariates to test for interactive effects between continuous predictors and within-subjects factors while reducing the risk of Type I Error rate (Sacco & Brown, 2018). No main effects or interactions emerged, prompting no further consideration of these data, *F*s<0.88, *p*s>0.349.

**Figure 1.** Perceived parental ability of high- and low-fWHR targets in protection and nurturance domains (with standard error bars) in Study 1.

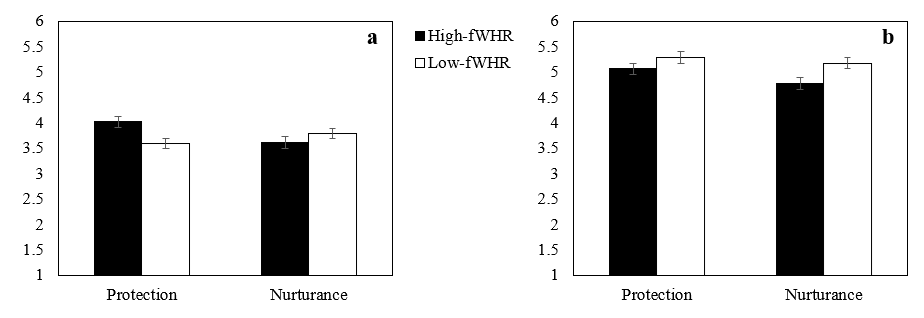
Graphical user interface, diagram

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**Figure 2.** Perceived parental ability of high- and low-fWHR targets presented upright (a) and inverted (b) in protection and nurturance domains (with standard error bars) in Study 2.

**Figure 3.** Perceived parental motivation of high- and low-fWHR targets in protection and nurturance domains (with standard error bars) in Study 3.

**Figure 4.** Perceived mating interest of high- and low-fWHR targets in LTM and STM (with standard error bars) in Study 3.



**Figure 5.** Perceived parenting ability of White (a) and Black (b) high- and low-fWHR targets in protection and nurturance domains (with standard error bars) in Study 4.

Diagram

Description automatically generated

**Figure 6.** Perceived parental ability of high- and low-fWHR male (a) and female targets (b) in protection and nurturance domains (with standard error bars) in Study 5.