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 have been made available at: [OSF LINK]

**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**

Linear mixed-effects models were used to investigate the effects of Participant Sex, fWHR, and Parenting Role on Parenting Efficacy. Models were constructed in *R* using the *lmer()* function taken from the *lme4* package (Bates, Mächler, Bolker, & Walker, 2015), Additionally, Bayes factors (BFs) were included when making comparisons across models. These were generated suing the *BayestestR* package (Makowski, Ben-Shachar, & Lüdecke, 2019). This package computes BFs via BIC fit indices. To interpret BFs, we follow the guidelines put forth by Kass & Raftery (1995) such that BFs greater than 1 are taken as evidence supporting the alternative hypothesis. As such, BFs ranging from 1 to 3.2 represent a small effect, 3.2-10 denote a substantial effect, 10-100 indicate a strong effect, and a BF > 100 is considered a decisive effect. We initially modeled parenting efficacy as functions of Participant Sex (Male vs. Female), Target fWHR (High vs. Low), and Parenting Role (Protection vs. Nurturance) along with all interactions. Participants were treated as a random effect. This full model was compared to intercept only and fixed effects models. Likelihood Ratio Tests (LRTs) confirmed that the full model provided the best fit to the data, ­χ2s ≥ 75.21, *p*s < .001; BFs > 100. As such, this model was used for the following analysis.

Overall, our final model yielded a significant effect of Parenting Role which indicated that targets were perceived as more effective in protecting their offspring than nurturing them (4.03 vs. 3.91). No significant effects of Participant Sex or Target fWHR were detected. Importantly, however, this model yielded a significant interaction between Target fWHR and Parenting Role, such that high-fWHR targets were perceived as more effective at protecting their offspring than low-fWHR targets (4.23 vs. 3.89). Regarding nurturing, no difference in perceived parenting efficacy was detected between high and low-fWHR targets (3.89 vs. 3.93). All other interactions, including the three-way interaction between Participant Sex, Target fWHR, and Parenting Role, were non-significant.

**Study 2**

**Method**

**Participants.** We recruited 194 participants from a 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**

As in Study 1, we again submitted our data to a linear mixed-effects model, which tested for effects of Participant Sex (Male vs. Female), fWHR (High vs. Low), and Parenting Role (Protection vs. Nurturance). Additionally, we tested for an effect of Target Presentation (Upright vs. Inverted). LRT testing confirmed that the final model containing all interactions provided the best for our data relative to intercept and main effects only models, ­χ2s ≥ 250.37, *p*s < .001; BFs > 100. Full output for our final model is available in Table 2. Overall, this model produced a significant effect of Parenting Role, as targets were perceived as more effective than nurturing (4.00 vs. 3.84, respectively). The effect of Target Presentation was also significant, with more parenting ability inferred for inverted faces than inverted ones (4.10 vs. 3.74). Finally, a main effect of Participant Sex indicated that women evaluated targets as more effective parents relative to men (3.99 vs. 3.64).

Importantly, this model revealed a significant three-way interaction between Parenting Role, Target fWHR, and Target Presentation. We decomposed this interaction by conducting simple interactions, separate for upright and inverted faces (Howell & LaCroix, 2012). Starting with upright faces, a significant interaction was detected between Parenting Role and Target fWHR. Low-fWHR targets were perceived as more effective at nurturing relative to high-fWHR targets (3.76 vs. 3.48). However, high-fWHR targets were perceived as more effective at protection relative to low-fWHR targets (3.48 vs. 3.72). However, for inverted faces, this interaction was non-significant (see Table 3 for upright and inverted model output).

**Study 3**

**Method**

**Participants.** We recruited 207 undergraduates from a private university in the 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 than low-fWHR targets (4.09 vs. 3.53), *t*(205) = 11.27, *p* < .001, *d* = 0.78.

**Parenting Motives.** We first modeled parenting motives as functions of Participant Sex (Male vs. Female), Target fWHR (High vs. Low) and Target Motive (Protection vs. Nurturance). Compared to intercept and main effects only models, our final model which included all interactions provided the best fit to our data, ­χ2s ≥ 44.46, *p*s < .001; BFs > 2.73. Full model output is displayed in Table 4. Overall, this model yielded a significant effect of Participant Sex, which indicated that men perceived targets as more parentally motivated than women (3.70 vs. 3.26). Additionally, a significant effect of Target Motive showed that targets were perceived as being more driven by protection motives than care motives (3.45 vs. 3.29).

A significant interaction was detected between Participant Sex and Target Motive, such that men were more perceived Protection targets as more parentally motivated than Nurturance targets (3.89 vs. 3.70). Women, however, showed no difference in parental motivation between for Protection and Nurturance Targets (3.27 vs. 3.28). Next, a significant interaction between Participant Sex and Target fWHR revealed that woman ascribed higher parental motivation to low-fWHR targets relative to high-fWHR targets (3.18 vs. 3.37). Men showed no difference in parental motivation between low and high-fWHR targets (3.74 vs. 3.81). Finally, a significant interaction also emerged between Target Motive and Target fWHR. Overall, high-fWHR targets were perceived as more driven by protection motives rather than nurturance motives (3.51 vs. 3.11), however, no differences between protection and nurturance motives were detected for low-fWHR targets (3.40 vs. 3.47). All other main effects and interactions were non-significant.

**Mating Interest.** Next, we modeled Mating Interest as functions of Participant Sex (Male vs. Female), Target fWHR (High vs. Low) and Context (STM vs. LTM) along with their corresponding interactions. Full model output is available in Table 5. Comparisons to intercept and main effects only models confirmed that our final model provided the best fit to our data, ­χ2s ≥ 31.89, *p*s < .001; BFs < 1. Though no significant main effects were detected, a significant interaction emerged between Target fWHR and Context, such that high-fWHR targets were perceived as more interested in STM versus low-fWHR targets (3.89 vs. 3.77). Furthermore, low-fWHR targets were viewed as more interested in LTM relative to high-fWHR targets (4.08 vs. 3.82). All other interactions were non-significant.

**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**

[words here]

**White Targets.** [Words here]

**Black Targets.** [Words here]

**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**

[words here]

**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**

[words here]

**References**

[ADD LME4 CITE HERE]

Table 1

*Summary of Linear Mixed Effects Modeling Output in Study 1*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparison | Estimate | *SE* | *t* | *p* value |
| Intercept | 4.06 | 0.20 | 20.54 | < .001\* |
| Sex = Female | -0.22 | 0.23 | -0.98 | .33 |
| Parenting = Protective | 0.40 | 0.11 | 3.61 | < .001\* |
| fWHR = Low | 0.06 | 0.11 | 0.55 | .58 |
| Sex = F. × Parenting = P. | -0.06 | 0.13 | -0.49 | .62 |
| Sex = F. × fWHR = L. | -0.02 | 0.13 | -0.18 | .86 |
| Parenting = P. × fWHR = L. | -0.56 | 0.16 | -3.59 | < .001\* |
| Sex = F. × Parenting = P. × fWHR = L | 0.09 | 0.17 | 0.52 | .61 |

Note: SE = Standard error. For Sex comparisons, Female reflects a model comparison to Male participants. For Parenting, Protective reflects a comparison to Nurturing. For fWHR, Low reflects a comparison to High. \* = *p* < .05.

Table 2

*Summary of Linear Mixed Effects Modeling Output in Study 2*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparison | Estimate | *SE* | *t* | *p* value |
| Intercept | 3.82 | 0.15 | 26.87 | < .001\* |
| Sex = Female | 0.20 | 0.16 | 1.22 | .22 |
| Parenting = Protective | 0.05 | 0.13 | 0.38 | .71 |
| fWHR = Low | 0.14 | 0.13 | 1.09 | .27 |
| Presentation = Upright | -0.54 | 0.13 | -4.15 | < .001\* |
| Sex = F. × Parenting = P. | 0.24 | 0.15 | 1.69 | .09 |
| Sex = F. × fWHR = L. | 0.04 | 0.15 | 0.25 | .80 |
| Parenting = P. × fWHR = L. | -0.23 | 0.18 | -1.31 | .19 |
| Sex = F. × Presentation = U. | 0.05 | 0.15 | 0.34 | .74 |
| Parenting = P. × Presentation = U. | 0.41 | 0.18 | 2.27 | .02\* |
| fWHR = L. × Presentation = U. | -0.03 | 0.18 | -0.19 | .85 |
| Sex = F. × Parenting = P. × fWHR = L. | -0.11 | 0.21 | -0.53 | .59 |
| Sex = F. × Parenting = P. × Presentation = U. | -0.17 | 0.21 | -0.83 | .41 |
| Sex = F. × fWHR = L. × Presentation = U. | 0.18 | 0.21 | 0.88 | .38 |
| Parenting = P. × fWHR = L. × Presentation = U. | -0.33 | 0.26 | -1.28 | .20 |
| Sex = F. × Parenting = P. × fWHR = L. × Presentation = U. | 0.12 | 0.29 | 0.42 | .67 |

Note: SE = Standard error. For Sex comparisons, Female reflects a model comparison to Male participants. For Parenting, Protective reflects a comparison to Nurturing. For fWHR, Low reflects a comparison to High. For Presentation, Upright reflects a comparison to Inverted. \* = *p* < .05.

Table 3

*Summary of Linear Mixed Effects Modeling Output split by Target Presentation in Study 2*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | Comparison | Estimate | *SE* | *t* | *p* value |
| Upright | Intercept | 3.28 | 0.15 | 21.30 | < .001\* |
|  | Sex = Female | 0.25 | 0.17 | 1.44 | .15 |
|  | Parenting = Protective | 0.46 | 0.14 | 3.37 | < .001\* |
|  | fWHR = Low | 0.11 | 0.14 | 0.78 | .44 |
|  | Sex = F. × Parenting = P. | 0.08 | 0.16 | 0.49 | .63 |
|  | Sex = F. × fWHR = L. | 0.22 | 0.15 | 1.41 | .16 |
|  | Parenting = P. × fWHR = L. | -0.57 | 0.19 | -2.93 | .003 |
|  | Sex = F. × Parenting = P. × fWHR = L | 0.01 | 0.22 | 0.06 | .95 |
| Inverted | Intercept | 3.82 | 0.14 | 26.71 | < .001\* |
|  | Sex = Female | 0.20 | 0.16 | 1.25 | .21 |
|  | Parenting = Protective | 0.05 | 0.12 | 0.41 | .68 |
|  | fWHR = Low | 0.14 | 0.12 | 1.20 | .23 |
|  | Sex = F. × Parenting = P. | 0.24 | 0.13 | 1.85 | .06 |
|  | Sex = F. × fWHR = L. | 0.04 | 0.13 | 0.27 | .79 |
|  | Parenting = P. × fWHR = L. | -0.24 | 0.17 | -1.43 | .15 |
|  | Sex = F. × Parenting = P. × fWHR = L | -0.11 | 0.19 | -0.59 | .56 |

Note: SE = Standard error. For Sex comparisons, Female reflects a model comparison to Male participants. For Parenting, Protective reflects a comparison to Nurturing. For fWHR, Low reflects a comparison to High. \* = *p* < .05.

Table 4

*Summary of Linear Mixed Effects Modeling Output for Parental Motivation in Study 3*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparison | Estimate | *SE* | *t* | *p* value |
| Intercept | 3.69 | 0.12 | 30.24 | < .001\* |
| Sex = Female | -0.46 | 0.14 | -3.24 | .001\* |
| Motive = Protection | 0.08 | 0.04 | 2.03 | .04\* |
| fWHR = Low | -0.02 | 0.04 | -0.57 | .57 |
| Sex = F. × Motive = P. | -0.24 | 0.05 | -5.06 | < .001\* |
| Sex = F. × fWHR = L. | 0.08 | 0.04 | 1.98 | .04\* |
| Motive = P. × fWHR = L. | 0.21 | 0.06 | 3.63 | < .001\* |
| Sex = F. × Motive = P. × fWHR = L | 0.11 | 0.07 | 1.69 | .09 |

Note: SE = Standard error. For Sex comparisons, Female reflects a model comparison to Male participants. For Motive, Protection reflects a comparison to Nurturance. For fWHR, Low reflects a comparison to High. \* = *p* < .05.

Table 4

*Summary of Linear Mixed Effects Modeling Output for Mating Interest in Study 3*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparison | Estimate | *SE* | *t* | *p* value |
| Intercept | 4.02 | 0.12 | 33.41 | < .001\* |
| Sex = Female | -0.26 | 0.14 | -1.91 | .06 |
| Context = STM | 0.03 | 0.10 | 0.27 | .79 |
| fWHR = Low | 0.17 | 0.10 | 1.82 | .07 |
| Sex = F. × Context = STM | 0.07 | .011 | 0.60 | .55 |
| Sex = F. × fWHR = L. | 0.11 | 0.11 | 0.98 | .33 |
| Context = STM × fWHR = L. | -0.34 | 0.14 | -2.49 | .01\* |
| Sex = F. × Context = STM × fWHR = L | -0.04 | 0.16 | -0.28 | .78 |

Note: SE = Standard error. For Sex comparisons, Female reflects a model comparison to Male participants. For Motive, Context reflects a comparison to LTM. For fWHR, Low reflects a comparison to High. \* = *p* < .05.

Table 6