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RESEARCH ARTICLE

Mate-by-Numbers: Budget, Mating Context, and Sex Predict Preferences for Facial and Bodily Traits

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Abstract

Unlike women, or men considering long-term mates, men pursuing short-term mating have shown a tendency to prioritize bodily information over facial information when assessing potential mates. Prior studies have documented this tendency across a variety of methods ranging from photograph ratings to forcing a choice between faces and bodies, but have yet to ask participants to prioritize individual traits in faces and bodies. The current study used a budget allocation method to do just that. We randomly assigned participants ($N = 258$) to a mating context (short-term or long-term) and a budget (high or low) and asked them to allocate points across 10 traits (five facial, five bodily) to design their ideal mate within their budget. As expected, men in the short-term mating context allocated more points to bodily traits, but only when in the low budget condition—in the high budget condition, men showed more interest in facial traits. Women, also as expected, and in contrast to men, showed a general trend toward favoring facial traits regardless of budget and condition. Overall, the results are consistent with the hypothesis that women's bodies provide better information regarding immediate fertility and are thus more important for men to assess in short-term mating contexts.

Keywords Physical attractiveness · Mate preferences · Face · Body · Traits · Evolution

Attractiveness researchers have become interested in the relative importance of facial and bodily attractiveness when making judgments about potential mates (Confer et al. 2010; Currie and Little 2009; Jonason et al. 2012; Lu and Chang 2012). Prior studies have shown that while women tend to prioritize facial information about potential mates regardless of mating context, men tend to shift their priorities toward facial information in long-term mating (LTM) contexts and toward bodily information in short-term mating (STM) contexts. There is also a dispositional effect in that a man's tendency to pursue STM is positively correlated with his prioritization of bodily information across contexts (Confer et al. 2010). The purpose of the current study was to investigate whether this conditional shift remains when accounting for specific facial and bodily traits.

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Individuals of both sexes are expected to desire a mate with an attractive face and body, but only the most appealing men and women are in a position to realistically demand or fulfill such preferences (Buss and Shackelford 2008; Fales et al. 2016). Due to the process of assortative mating (Buss 1984; Luo 2017; Thiessen and Gregg 1980), most individuals will likely be obligated to relax their preferences for facial or bodily attractiveness to obtain a partner and, in so doing, must prioritize some traits over others. Faces and bodies provide many overlapping cues to phenotypic quality (Thornhill and Grammer 1999). Ovulatory status is one such condition that appears to be reflected across women's faces (Puts et al. 2013; Roberts et al. 2004) and bodies (Kirchengast and Gartner 2002; cf. Bleske-Rechek et al. 2011) alike. Nevertheless, Confer et al. (2010) and Cloud and Perilloux (2014) argue that traits present in a woman's face (e.g., wrinkles) may provide relatively richer information regarding her *future* reproductive potential, whereas traits present in her body (e.g., waist-to-hip ratio) may convey relatively stronger cues regarding her *current* fertility. A woman's pregnancy status, for example, can be more easily detected from viewing her body than her face, particularly as her pregnancy progresses. Thus, if a woman's current fertility status—more so than her future

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reproductive potential—can directly impact the reproductive success of men in STM contexts, and if Confer et al. (2010) are correct that a woman's fertility might be more readily assessed through bodily traits, we would expect greater interest in—and prioritization of—bodily attractiveness among men pursuing STM.

Indeed, several studies have shown exactly that: men do prioritize information about women's faces and bodies differently as a function of mating context (Confer et al. 2010; Currie and Little 2009; Jonason et al. 2012; Lu and Chang 2012). In these studies, men pursuing STM (by disposition or random assignment) show greater interest in a woman's body—where cues of current fertility are hypothesized to be more densely concentrated—relative to LTM men. This pattern occurs reliably across a variety of methods: attentional adhesion procedures (Lu and Chang 2012), ratings of static photographs (Currie and Little 2009; Mueser et al. 1984), and forced choice (Confer et al. 2010). Women, in contrast, need not attend to cues of fertility in a potential mate (Symons 1979), and even if they did, there is no reason to suspect that such cues would be more densely concentrated in men's faces or bodies: good gene cues to which women have been shown to attend are present across men's faces and bodies (Folstad and Karter 1992; Gangestad et al. 1994; Thornhill and Gangestad 1993). Women are therefore not expected to show any context-dependent shifts in the prioritization of men's faces and bodies.

One recent study relaxed many of the limitations inherent in studies of attractiveness preferences (i.e., forced choice between pre-selected drawings or images) by asking heterosexual participants to draw—freehand—a maximally attractive member of the opposite sex (Cloud and Perilloux 2015). In this study, short-term-oriented men did not exhibit higher standards for bodily attractiveness components (e.g., breast size) relative to long-term-oriented men; given the unconstrained nature of this drawing task, however, prioritization could have been relatively undetectable because each man could draw his ideal partner without making any trade-offs. That is, each man could draw a woman he finds maximally attractive on all dimensions, without any need to prioritize certain traits (e.g., bodily) over others (e.g., facial). Therefore, the current study used a more comprehensive task in which individual traits were judged and prioritized relative to one another simultaneously.

While some studies have forced participants to decide between, or trade-off, facial or bodily information when making decisions about attractiveness or mate choice (Confer et al. 2010; Jonason et al. 2012), no prior studies have done so on a trait-by-trait basis. Given that most attractiveness research to date has investigated the importance of particular traits, our approach for the current study used traits as the level at which participants made decisions. We then combined these individual judgments into composite variables and compared preferences across the overarching constructs of faces and bodies, which have been hypothesized to represent meaningful sets of cues (Cloud and Perilloux 2014; Confer et al. 2010). We asked participants to design their ideal (i.e., maximally attractive) mate for either STM or LTM by investing in various facial and bodily traits, but within a budget: some participants had relatively more freedom to achieve their ideal mate than others who had to make more trade-offs. Based on the results of past research using constrained tasks of this nature, we predicted that men assigned to the STM context would prioritize bodily traits over facial traits, while men assigned to the LTM context, and women assigned to either context, would prioritize facial traits over bodily traits.

Method

Participants

We recruited participants via Amazon's Mechanical Turk (MTurk), an online marketplace where community members complete tasks online in exchange for payment. Each MTurk participant received $0.60 for completing the survey—unless they failed our attention checks ($N = 18$), spent less than 2 min completing the survey ($N = 8$), or responded to demographic questions in a way that indicated they completed the wrong survey (e.g., took the survey for heterosexual participants but indicated they were homosexual, took the survey for men but indicated they were a woman; $N = 30$). We removed participants meeting any of these exclusionary criteria, and some participants met more than one. Our final sample consisted of 258 participants (130 men, 128 women) whose ages ranged from 20 to 75 ($M = 37.84$; $SD = 12.21$). They reported their ethnicities as White, 79%; Black or African-American, 9%; Asian, 5%; Hispanic or Latino, 5%; and multiracial, 2%. Most participants reported being in a romantic relationship (married, 45%; committed closed relationship, 17%; engaged, 2%; committed open relationship, 1%); about a third of our sample was not in a romantic relationship (single, 27%; dating, 9%).

Materials and Procedure

The survey was conducted online, and after obtaining informed consent, participants answered basic demographic questions and the SOI-R (Penke and Asendorpf 2008) to assess individual differences in mating strategy, followed by the key measure of facial and bodily preferences, and then ended with a debriefing.

We assessed the degree to which participants preferred facial or bodily traits with a set of sliders (see Fig. 1). The sliders were labeled with a list of facial and bodily traits (the order of which was randomized for each participant). Each participant was randomly assigned to both a mating context (short-term

Fig. 1 A completed example (male participant, high budget condition) of the slider system by which participants indicated their preferences for their hypothetical mate. Selections were indicated by the placement of the sliders as well as the corresponding numbers on the right. A running total at the bottom let participants know how much of their budget they had spent

or long-term) and a budget (small—30 points or large—70 points); the latter determined the cumulative amount they could move their sliders (this total was displayed and enforced automatically on the online survey). A large budget meant a participant could obtain highly desirable levels of multiple (but not all) traits; a small budget meant a participant could obtain highly desirable levels of only a few traits or low levels of desirability across more traits. The instructions we provided participants are below, with pronouns adjusted to match each participant's reported gender and aspects that varied across conditions in brackets:

> First, imagine that you are single and not romantically committed to anyone. Now, imagine that you could physically design a woman [man] as your ideal short-term mate (i.e., someone with whom you would want sex without a committed relationship) [long-term mate (i.e., someone with whom you would want a committed romantic relationship)]. Using the sliders below, you can indicate how desirable you would like each trait to be. Leaving a slider at 0 means this individual will have the least desirable version of that trait you can imagine; pushing a slider to 10 means this individual will have the most desirable version of that trait you can imagine. For this task, you will have 30 [70] points to allocate using the sliders (you must use exactly 30 [70] points to complete this task).

We selected the 10 traits for this task by examining the literature on preferences for facial and bodily features and identifying five facial (i.e., eyes, smile, nose, complexion, hair) and five bodily (i.e., chest/bust size, waist size, hip size, height, muscle tone/muscularity) traits that likely underlie evolved preferences for male and female physical attractiveness (for a review, see Sugiyama 2005). We also wanted the traits selected to be identical for both sexes (i.e., eyes, smile, nose, facial complexion, hair, waist size, hip size, height) or have some meaningful corollary in the opposite sex (i.e., breast size/chest size, muscle tone/muscularity) to keep the lists as comparable as possible for men and women. That said, our main goal was not to analyze individual traits but rather to sum them into two meaningful composite scores: face and body. In our sample, reliability for the face composite was good (Cronbach's $\alpha = .86$) and reliability for the body composite was acceptable (Cronbach's $\alpha = .73$). Finally, we calculated a single prioritization score indicating the degree to which a participant favored facial traits over bodily traits by converting their composite scores into proportions (e.g., .33 face, .67 body) and then subtracting their body proportion from their face proportion. Positive values therefore indicate greater prioritization of facial traits over bodily; negative values indicate greater prioritization of bodily traits over facial; a score near zero indicates equal prioritization of facial and bodily traits. The average value for the prioritization score in our sample was 0.04 ($SD = 0.20$), which is significantly greater than 0, $t(257) = 3.22$, $p = .001$, indicating slightly greater prioritization of facial traits overall, consistent with past research (Confer et al. 2010; Currie and Little 2009; Jonason et al. 2012; Mueser et al. 1984).

Results

As predicted, there was a slight preference toward faces overall: a single-sample t test comparing scores to 0 (equal preferences) revealed a small but significant preference for facial features, $t(257) = 3.22$, $p = .001$, $d = 0.20$. This tendency—as predicted—varied by condition, as the following ANOVA illustrates in greater detail. We analyzed the results with a 2

(sex: male, female) × 2 (mating context: short-term, long-term) × 2 (budget: high, low) factorial ANOVA using SOI-R scores as a covariate. The effect of SOI-R scores was very small, $F(1, 257) = 0.03$, $p = .86$, and did not materially affect any of the other effects in the model. Therefore, the results below are with SOI-R removed from the model for simplicity. The full model with SOI-R included is available upon request from the corresponding author.

The predicted three-way interaction was significant, $F(1, 257) = 4.18$, $p = .04$, $\eta_p^2 = .02$. As depicted in Fig. 2, men exhibited a significant two-way interaction, $F(1, 129) = 6.33$, $p = .01$, $\eta_p^2 = .05$, whereas women did not, $F(1, 127) = 0.44$, $p = .51$, $\eta_p^2 = .004$. Based on simple slopes analysis, men in the long-term condition showed a stable preference for facial traits across budget conditions, $\beta = 0.02$, $b = 0.01$, $F(1, 73) = 0.04$, $p = .84$, but men in the short-term condition showed a significant shift to bodily traits with the low budget, $\beta = 0.40$, $b = 0.16$, $F(1, 53) = 9.96$, $p = .003$. Neither women in the LTM condition, $\beta = 0.12$, $b = 0.06$, $F(1, 61) = 0.88$, $p = .35$, nor women in the STM condition, $\beta = 0.02$, $b = 0.01$, $F(1, 63) = 0.02$, $p = .88$, showed a significant shift in preferences across budgets.

Although qualified by the three-way interaction, the remaining results of the ANOVA are reported here for completion. The two-way interaction of sex and context was significant, $F(1, 257) = 8.79$, $p = .003$, $\eta_p^2 = .03$, such that men showed greater preference for bodily traits in STM than LTM contexts whereas women showed the opposite pattern. The two-way interaction of sex and budget was not significant, $F(1, 257) = 0.96$, $p = .33$, $\eta_p^2 = .004$, nor was the two-way interaction of context and budget significant, $F(1, 257) = 0.97$, $p = .33$, $\eta_p^2 = .004$. The main effect of budget was significant, $F(1, 257) = 5.45$, $p = .02$, $\eta_p^2 = .02$, such that participants favored facial traits more when given higher than lower budgets. The main effect of context was not significant, $F(1, 257) = 0.30$, $p = .58$, $\eta_p^2 = .001$, nor was the main effect of sex significant, $F(1, 257) = 0.31$, $p = .58$, $\eta_p^2 = .001$.

We did not design our materials with the goal of assessing specific traits individually; therefore, we simply provide descriptive data on the traits and indicate those for which there was a significant sex difference in budget allocation (see Table 1). The largest sex differences occurred for bodily rather than facial traits—which is consistent with prior work in this area proposing that women's bodies contain special cues of fertility (e.g., waist, hips, breast size; Confer et al. 2010). The full MANOVA (sex × context × budget) on the individual traits revealed very few significant interactions within the many comparisons, so the full complement of results is not presented here but is available upon request from the corresponding author.

Table 1 Exploratory analysis of sex differences by trait

Trait	Women *M*(*SD*)	Men *M*(*SD*)	*t*(256)
Smile	6.78(2.88)	6.52(2.87)	0.47
Eyes	5.90(3.04)	6.11(2.86)	0.57
Hair	4.93(2.94)	5.47(2.80)	1.51
Nose	3.75(2.90)	4.64(2.93)	2.45*
Complexion	5.00(3.01)	6.16(2.87)	3.17*
Chest/bust size	4.16(2.81)	5.52(2.66)	4.01***
Waist size	4.44(2.65)	6.10(2.46)	5.21***
Hip size	3.48(2.81)	5.52(2.74)	5.90***
Muscle tone/muscularity	5.94(2.75)	4.58(2.58)	−4.07***
Height	5.94(2.81)	4.30(2.78)	−4.73***

*$p < .05$; ***$p < .001$ these statistics ignore budget and mating context conditions

Discussion

Results from the current study indicated that men and women in the high budget condition prioritized facial traits over bodily traits at the same rate, regardless of mating strategy. Once constrained by budget, however, men in the short-term mating condition prioritized bodily traits whereas men in the long-term mating condition prioritized facial traits, in line with our predictions. These results support the hypothesis that men in a STM context shift their priorities toward bodily traits more than men in a LTM context and women in any context. This is consistent with most studies in this area that show a preference for bodily information by men in STM contexts across methods such as attentional adhesion (Lu and Chang

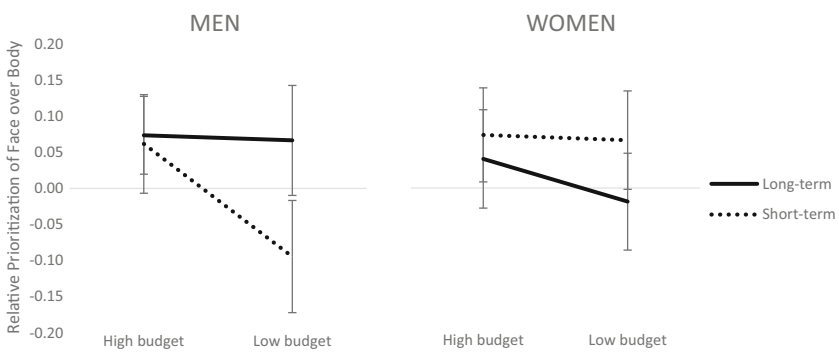

Fig. 2 There was a significant three-way interaction between participant sex, budget condition, and mating context on the degree to which facial traits were desired over bodily traits

2012), photograph ratings (Currie and Little 2009; Mueser et al. 1984), and forced choice (Confer et al. 2010).

As predicted, women tended to exhibit an overall preference for facial traits over bodily traits. Women in a LTM context with a low budget, however, showed relatively more interest in bodily traits than facial traits, though this was not a large enough effect to impact the interaction or simple slope results. It is possible that this group in our sample represents a Type I error. If so, the overall pattern of results would be in line with previous claims that men's faces and bodies do not provide different information that would be more useful in one mating context than another (Sugiyama 2005; Symons 1979). Instead, men's faces and bodies are hypothesized to provide similar information to viewers regarding traits that women prefer in their mates, such as strength, physical prowess, age, and health (Buss 1989). For instance, studies show that men's strength and fighting ability can be reliably diagnosed from a facial photograph alone (Fink et al. 2007; Little et al. 2015; Zilioli et al. 2015), whereas women's strength is not as easily determined from their faces (Sell et al. 2009). Given that faces are more readily accessible for viewing and provide a wealth of predictive information in a relatively small area, faces are expected to be of interest by default. That said, it is possible that women in LTM contexts—when given a low budget—really do shift their priorities toward bodily traits, in which case further work is necessary to explore this preference and its implications.

Based on our results, a promising future direction would be to examine whether women are aware of men's context-specific preferences and allocate time and effort accordingly, based on the mating strategy they are pursuing. For example, women inclined toward STM might be more likely to invest time, effort, and resources into increasing the attractiveness of their bodies relative to their faces, while women inclined toward LTM might show the reserve pattern. Women pursuing STM do seem to base their overall self-perceived attractiveness more on bodily traits (e.g., BMI) than women pursuing LTM (Perilloux et al. 2013). Whether women are in fact differentially motivated toward face and body appearance enhancement, and whether this motivational mechanism requires or accepts conscious input and consideration, is a ripe area for research.

A major limitation of this, and most other research using budget allocation designs, is that budget allocation taskslack ecological validity—we do not in fact select mates trait-by-trait, but must instead evaluate whole individuals comprised of various combinations of levels of these traits. This limitation could be addressed in future research using a conjoint analysis (e.g., Mogilski and Welling 2017, 2018). This method is borrowed from consumer science and could work in this context by having participants evaluate systematically generated potential mates—with facial traits and bodily traits controlled and presented in many potential combinations—rather than rating or ranking traits in isolation.

Just as it is a strength that our participants were able to define their own best and worst version of traits, it is also a limitation to our ability to generalize because we do not know exactly what participants thought the anchors of each scale would look like: did they actually visualize the absolute worst possible nose, for example, when imagining what a 0 represents on the scale? Did they correctly imagine the difference between eyes in the 50th and 60th percentiles? And is it the same as the difference between the 60th and 70th percentiles? In addition, this method does not allow for the evaluation of the content of trait preferences; however, a plethora of research has already identified specific values that men and women find attractive across a variety of traits (e.g., 0.70 waist-to-hip ratio; Singh 1993) and the purpose of this study was simply to assess the prioritization of facial and bodily attractiveness overall. Despite these potential limitations, we documented a similar pattern of results as previous research, which suggests the method is likely valid.

Prior research has documented a tendency for men—but not women—to shift from prioritizing facial attractiveness in LTM contexts toward bodily attractiveness in STM contexts (Confer et al. 2010; Currie and Little 2009; Jonason et al. 2012; Lu and Chang 2012). The current study deployed a method whereby participants considered specific facial (e.g., eyes) and bodily (e.g., waist size) traits and found a similar effect. This implies that predictions derived from an evolutionary explanation regarding the tendency to pay attention to faces and bodies continue to hold, even with trait-level judgments. As expected, in the low budget condition—when preferences were most constrained—men in the STM condition allocated more points to bodily traits; men in all other conditions showed greater interest in facial traits, as did women. These results contribute to a growing literature supporting the view that men pursuing STM focus on cues of immediate fertility, which may be more efficiently evaluated through a woman's body than her face.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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