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Women's preferences for men's facial masculinity and anticipations of grandparental care provision

Running head: Facial masculinity preferences and grandparental care

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Abstract

Women vary in the extent to which they prefer facial masculinity in a male partner, and much research has focused on explaining this variation systematically, with reference to the significance of men's facial masculinity. Masculine-faced men provide some benefits (either real or perceived) as a romantic partner, but are perceived as less investing as parents. Accordingly, we investigated whether a UK-based sample of women (n = 366) had stronger preferences for male facial masculinity if they anticipated that their own parents would provide more time, money, and emotional investment in future grandchildren (i.e. the women's future offspring), thereby alleviating any potential shortfall from the child's father. In line with our hypothesis, we found that women had stronger preferences for men's facial masculinity if the women anticipated that their fathers would provide more financial investment in their future grandchildren. We also found that women anticipated time, money, and emotional investment from their parents (particularly their mother) in their role as grandparents; given existing research on grandparental investment, participants' anticipations are likely to be at least somewhat realistic.

Introduction

Much research has aimed at understanding how physical traits influence partner choice. One focus has been on men's facial masculinity, which is something that might indicate various desirable qualities in a relationship partner. Masculine-faced men are perceived as more dominant (Boothroyd et al. 2007; Johnston et al. 2001), and may have advantages in male-male competition (Puts 2010; Puts et al. 2012). Masculine-faced men may also experience better health (Rhodes et al. 2003; Thornhill and Gangestad 2006; Boothroyd et al. 2013; Rantala et

al. 2013; Gangestad et al. 2010; Phalane et al. 2017), although this relationship does not go undisputed (Scott et al. 2013; Zaidi et al. 2019). Finally, male facial masculinity has been linked to genetic benefits (see e.g. DeBruine 2014; Little et al. 2011b), although this formerly popular position has been the subject of much criticism (DeBruine 2014; Scott et al. 2013).

Yet masculine-faced men may also present costs to a romantic relationship. Masculine-faced men are perceived as being poorer as parents (Perrett et al. 1998; Johnston et al. 2001; Kruger 2006; Boothroyd et al. 2007), and as more aggressive, even across different cultures (Scott et al. 2014). There is some evidence that facial masculinity reflects testosterone levels (Penton-Voak and Chen 2004; Roney et al. 2006; Fink et al. 2005; Whitehouse et al. 2015; Pound et al. 2009), although this is not found consistently (Apicella et al. 2011; Koehler et al. 2004; Peters et al. 2008; Ferdenzi et al. 2011; Lefevre et al. 2013; Apicella et al. 2008; Burriss et al. 2007; Kordsmeyer et al. 2019; Rantala et al. 2013; Hönekopp et al. 2007). If the relationship between men's testosterone and facial masculinity is robust, it is relevant that men with higher testosterone are more likely to leave a relationship or to have troubled relationships (Gray et al. 2019; Wingfield et al. 1990; Gray et al. 2002). People certainly perceive masculine-faced men to be more likely to be unfaithful or to leave a relationship (e.g. Boothroyd et al. 2008; Booth and Dabbs 1993; Kruger 2006). That is, overall, masculine-faced men provide some benefits (real or perceived) as a romantic partner, but potentially at an increased risk of underinvestment in or termination of the relationship.

Women vary in the extent to which they prefer facial masculinity in a male partner (DeBruine et al. 2006). Some of this variation appears to be contingent upon cultural-level factors (Scott et al. 2014), but variation is also apparent within cultures, and much research has focused on explaining it systematically, with reference to the costs and benefits, described above, associated with male facial masculinity (Rhodes 2006; Fink and Penton-Voak 2002). Variation in women's preferences for men's facial masculinity (both within and between individuals) is hypothesised to reflect those costs and benefits (see e.g. DeBruine 2014; Little et al. 2011b). Thus, for instance, women have stronger preferences for facial masculinity when their state or country has poorer average health (DeBruine et al. 2010a; Penton-Voak et al. 2004; DeBruine et al. 2011) and when pathogens are more salient to them (Little et al. 2011a; DeBruine et al. 2010b), potentially leading to greater attraction to healthy partners as health becomes relatively more important. Similarly, women preferred more feminine male faces if they reported low-quality relationships with their parents during childhood, or when asked to imagine living in a more resource-poor environment, when partner investment might be more important (Little et al. 2007; Boothroyd and Perrett 2008).

As humans are co-operative breeders, one factor in evaluating the costs and benefits of male facial masculinity could be the investment that would be forthcoming from an individual's parents in their role as the grandparents of any offspring that might result from a reproductive partnership. Grandparental care of grandchildren can enhance those children's prospects in both pre-modern and contemporary populations (Lahdenpera et al. 2004; Deleire and Kalil 2002; Sear and Mace 2008). Although grandparental presence is not unambiguously advantageous to grandchildren, and grandmothers seem to be more beneficial than grandfathers (review in Coall and Hertwig 2010), grandparents can and regularly do provide direct childcare, as well as other resources

including money, time, gifts, food, and educational opportunities (Fergusson et al. 2008; Coall and Hertwig 2010; Jappens and Van Bavel 2012). Grandparents may make up for the consequences of father absence or lack of investment (Blaikie 1998). Therefore, the anticipation of high levels of support from one's parents in their role as future grandparents may partially offset the perceived risks inherent to selecting a masculine man as a partner. Accordingly, we tested the hypothesis that women would have stronger preferences for masculinity in men's faces if they anticipated higher levels of grandparental investment in potential offspring.

Methods

Participants: Participants were recruited predominantly from psychology mailing lists and teaching contacts at various UK universities, as well as from social media adverts and personal contacts. Participants were excluded if they appeared to have taken part twice, based on the personalized identifier code they generated from biographical information or the email address they supplied for a follow-up study (n = 9: second data entry removed, based on date), or if they did not provide answers to all of the questions around grandparental investment (n = 4), or if they stated their sexual orientation as something other than heterosexual (n = 39). Following some additional exclusions (n = 13; see 'Perceived grandparental investment' below), we report data from 366 women aged 18 – 49 (mean (± SD) = 21 (± 4) years old. The sample size was not predetermined, but arose in the process of trying to collect sufficient data for a separate study that had a number of exclusion variables.

Statistical power: Although there are many problems with basing effect size predictions on existing research (Ledgerwood et al. 2017), as a point of comparison, exposing participants to cues to pathogens has been reported to have a medium-sized effect on women's male facial masculinity preferences (ηp^2 = 0.061; Little et al. 2011a), while the relationship between women's male facial masculinity preferences and their ratings of parental warmth has been reported to be of small effect size (rs = 0.1; Boothroyd and Perrett 2008). Post-hoc power analysis confirmed that our sample size should give us >99% power to detect a medium effect (r = .3) but only 48% power to detect a small effect (r = .1) in a correlation with alpha set at 0.05 (G*Power 3.1; Faul et al. 2009).

Male facial masculinity stimuli: Male face stimuli were created from 15 male composite images. Each composite image was created from an amalgamation of three photographs, taken from a White student image set photographed at the University of St Andrews. This procedure meant that no individual was recognizable but each composite image had a distinct appearance. Each of the 15 composite images was transformed by ±50% of the shape and colour difference between an average male and average female face (Perrett et al. 1998), to create 15 pairs of images, where the two images within each pair differed only in masculinity-femininity (see Fig. 1). The transform would masculinise the face by, for instance, increasing the size and shape of the jaw (shape transform) and increasing apparent facial stubble (colour transform; see Fig. 1); these changes together influence perceptions of facial masculinity (Addison 1989; Neave and Shields 2008; Dixson and Brooks 2013; Mefodeva et al. 2020).

Figure 1 about here

Perceived grandparental investment: We asked participants about predicted/expected investment (financial, time, and emotional investment) that their parents might provide as grandparents, in respect of each participant's mother and father separately, using questions which followed previous work on grandparental investment (Michalski and Shackelford 2005). Perceived financial investment was assessed with the question: "Imagine you had a baby tomorrow. For each of the first 20 weeks of that baby's life, on average, how much money do you think your [mother / father] (the child's [grandmother / grandfather]) would spend on that baby (including gifts, meals, cash, equipment etc.) PER WEEK?". Sums ranged from £0 - £300, with the exception of one participant who reported a sum of £2000 in respect of the grandmother, and one participant who reported a sum of £500 in respect of the grandfather; they were excluded in case they reflected participant misunderstanding, error, or spuriousness. Time investment was assessed with the question: "Imagine you had a baby tomorrow. For each of the first 20 weeks of that baby's life, on average, how much time (in hours) do you think your [mother / father] (the child's [grandmother / grandfather]) might spend with that baby PER WEEK (including babysitting, active play, meal times, bath times, etc)? Note, 1 week = 168 hours". Eleven participants were excluded because they indicated a time investment of >168 hours (8 participants in relation to both parents, and 3 in relation to the grandmother), indicating error or lack of engagement. Finally, emotional investment was assessed with the question: "Imagine you had a baby tomorrow. How emotionally close do you think your [mother / father] (the child's [grandmother / grandfather]) would become to that child, on a scale from 0 (Not at all close) to 8 (Extremely close)?". In the analysis, we refer to these six variables as moneyGM, moneyGF, timeGM, timeGF, loveGM, and loveGF.

Procedure: The project was granted ethical approval by the XX University Department of Psychology Ethics Committee, and performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. The study was administered online using the survey application Qualtrics (www.qualtrics.com). Participants were invited to participate as part of a larger study on attraction and family relationships, and completed the masculinity preference tests as part of a longer battery of facial preference tests. First, participants provided some demographic details. Next, they carried out a forced-choice face rating task. Within this, 15 trials made up the masculinity preference test, where participants were presented with a pair of male faces that were identical except that one was higher and one lower in masculinity (see 'Male facial masculinity stimuli'). The participant chose which face in each pair they thought was more attractive. Subsequently, participants carried out a self-rated attractiveness task where they stated whether they perceived themselves to be more or less attractive than 20 women each depicted in a photograph, and answered some questions on personality and attitudes to parental involvement in relationships; these are not reported here. Next, participants completed the grandparental investment questions (see above), then some questions around their parents and their relationship with their parent which are not reported here.

Data analysis: We used mixed-effects regression to model relationships between expected grandparental investment and preferences for facial masculinity. For ease of interpretation, we z-standardized all predictors. This analysis takes into account that both participants and facial stimuli are sampled, and therefore generalizations to two different populations (female perceivers and male faces) are required (Baayen et al.

2008). The binary nature of our dependent variable (prefer masculinized or feminized version in each face pair) requires logistic regression. For each individual choice, logistic regression models the probability that the masculinised version is chosen. With probabilities being bounded by 0 and 1, standard linear regression is unsuitable as it would frequently produce meaningless predictions outside the 0 – 1 interval. To avoid this problem, logistic regression expresses probabilities as logits (the logarithm of the odds ratio), which can take any value[1]. Logits are suitable to compare different effects with regard to their magnitude, but they defy an intuitive interpretation, which is why we translate all effects back into probabilities (Gelman and Hill 2006)[2].

For logistic regression models, deviance is a measure that reflects unaccounted variance in the outcome variable. Deviance can be used to evaluate if one model performs statistically significantly better than another model. To this end, we used χ^2 tests on the difference in the models' deviances, with the difference in the models' degrees of freedom providing the degrees of freedom for that test (Sommet and Morselli 2017).

The t-test and correlational analyses were carried out in SPSS v.26 using bootstrap methods (2000 samples). The remainder of the analysis was carried out in R, using the glmer function in lme4 (Bates et al. 2014). Only the variables listed in the Results section below, and none of the other variables collected (see Procedure section), were used in our analyses of grandparental investment and facial masculinity preferences. The datasets and R code used for our analyses are available on the OSF (https://osf.io/hkuwq)

Results

Participants' expectations of the weekly grandparental contribution to a new offspring ranged from £0 – £300 and from 0 – 168 hours in respect of both grandmother and grandfather. Means (± SDs) were £47 (± £45) and 43 hours (± 32 hours) for grandmothers, and £42 (± £47) and 31 hours (± 31 hours) for grandfathers. Reported emotional closeness also ranged across the whole 1 – 8 scale in respect of both grandparents (means (± SDs) were 7.1 (± 1.3) for grandmothers, and 6.3 (± 1.7) for grandfathers). There were several significant correlations across the different types of grandparental investment, ranging from small to large effect size (Table 1). The investment anticipated from grandmothers was significantly greater than that anticipated from grandfathers in relation to all three types of investment (money: t(365) = 3.14, p = .002, bias corrected and accelerated 95% CI [2.13 – 8.17]; time: t(365) = 10.38, p < .001, BCa 95% CI [9.95 – 14.40]; emotional closeness: t(365) = 9.10, p < .001, BCa 95% CI [0.62 – 0.95]).

Table 1 about here

To test our hypothesis, we wanted to examine how each of the six predictors (moneyGM, moneyGF, timeGM, timeGF, loveGM, and loveGF) predicted masculinity preferences. To provide a baseline against which

[1] In our case, the odds ratio (OR) equals the probability that the masculinized version is chosen divided by the probability that the feminized version is chosen. If p(masculinised) = 0.8 for any given trial, OR = 0.8/0.2 = 4.0, resulting in logit = 1.39. Conversely, p(masculinised) = 0.2 translates into OR = 0.2/0.8 = 0.25 and logit = -1.39. Gelman and Hill (2006) and Sommet and Morselli (2017) provide accessible introductions.

[2] To stick with the previous example, we use $e^{-1.39} = 0.25$ to convert our logit to its OR. We then use $p = OR/(1 + OR)$ to revert this odds ratio to p = 0.2.

subsequent models with predictors could be compared, we first analysed the empty model, which is devoid of predictors (Sommet and Morselli 2017). Deviance equalled 5203.9 (*df* = 5487). The model's fixed intercept reflects the average probability for preferring the masculine face; the variability in its random intercepts reflects the extent to which masculinity preference varies across participants and across face pairs. The fixed intercept proved to be 1.63, which corresponds to an estimated average probability of 84% for choosing the masculinised face in a pair. This indicates a strong overall preference for the masculinised over the feminised faces. SDs for the random intercepts proved to be 1.08 for participants and 0.58 for face pairs, indicating that masculinity preferences varied about twice as much across the former than the latter. Average masculinity preference ranged from 60% to 93% for 'typical' participants (±1SD around the average of 84%) and from 69% to 84% for 'typical' face pairs (again, ±1SD around the average). Random intercepts for participants and face pairs hardly changed in subsequent models; consequently, we will not comment on them further.

We then added the six predictors reflecting expected grandparental investment as fixed effects (Model 1). Fixed effects here means that each predictor's effect remains the same across face pairs. This model provided a statistically significant improvement over the empty model, $\chi^2(6) = 15.1$, $p = .019$. Model details are shown in Table 2. To facilitate interpretation of the logits, the third column shows how each statistically significant predictor shifts the average probability (84%) of choosing the male face. More precisely, the column reflects the expected probability shift when the predictor increases by 1SD and all other predictors are held constant at zero (which is the mean for our z-standardized predictors). Three of the predictors (moneyGM, moneyGF, and loveGM) turned out to be statistically significant. In line with expectations, moneyGF was positively associated with masculinity preference; on the contrary, moneyGM was negatively related to masculinity preference. This is odd for two reasons. First, it runs against theoretical reasoning. Second, and perhaps more importantly, it is difficult to see why financial support should have opposite effects depending on whether it stems from the prospective grandfather or grandmother.

Table 2 about here

To clarify matters, we tested a similar model that omitted the strongest predictor, moneyGF (Model 2). Model 2 failed to significantly improve on the empty model, $\chi^2(5) = 4.5$, $p = .480$, and the significant effects observed for moneyGM and loveGM in Model 1 disappeared (see Table 2 for details). Moreover, none of the five predictors proved statistically significant when tested on their own (all ps $\geq .248$, details not shown). This pattern of results eliminates moneyGM and loveGM as credible predictors of masculinity preferences, statistically significant effects in Model 1 notwithstanding.

When moneyGF was tested as a fixed effect on its own (Model 3), it proved statistically significant. In line with expectations, it had a positive (but small) association with masculinity preferences (see Table 2), and predicted that an increase in grandfather investment by one standard deviation (£47 per week) would correspond to a 2.1% increase in the proportion of masculine faces selected. This raises the question of how consistent this relationship is across face pairs. In order to test this, we created another model that treated moneyGF as a random variable (i.e. its slope was free to vary across face pairs). However, this relaxation failed to improve

statistically significantly on Model 3, $\chi^2(2) = 2.2$, $p = .333$. Thus, the association between greater presumed financial help from the prospective grandparent and increased preference for the masculinised face version appeared invariant across face pairs.

Discussion

Masculine-faced men may provide some benefits to a relationship, but are perceived as less investing as parents (Perrett et al. 1998; Johnston et al. 2001; Kruger 2006; Boothroyd et al. 2007), and as more likely to be unfaithful or to leave a relationship (e.g. Boothroyd et al. 2008; Booth and Dabbs 1993; Kruger 2006). Accordingly, we investigated whether women had stronger preferences for male facial masculinity if they anticipated that their parents would invest more in their grandchildren (the women's offspring), on the basis that this grandparental investment could make up for a shortfall in paternal care.

In line with our hypothesis, we found that women had stronger preferences for men's facial masculinity if they anticipated that their father (the future child's grandfather) would contribute more financially. That is, women may adjust their facial preferences facultatively, and be slightly more willing to prefer a masculine men, despite the higher risks of a loss of paternal investment, if they feel more confident that investment could be obtained elsewhere. The effect was small in size, although small effect sizes are the norm within social psychology (Richard et al. 2003), and we would not anticipate finding large effects given the multitude of variables that can influence women's facial masculinity preferences (Marcinkowska et al. 2019). Complementing our empirical findings, a mathematical model can be used to show how parental investment in their grown-up daughter can be dependent upon the resources that the daughter receives from her partner, and that this interaction can feed into the daughter's mate choice (van den Berg et al. 2013). In many cultures, parents have an explicit role in selecting partners for their grown-up children (Apostolou 2014, 2007; Buunk et al. 2008), but even in cultures where people feel relatively independent of their parents in making their partner choices, such as that where this study was carried out, people seem still to draw from an awareness of their broader family network when evaluating potential partners.

Naturally, we would not rule out possible alternative explanations. As one example: previous research indicates that women tend to pick partners and prefer faces that resemble their fathers (e.g. Bereczkei et al. 2004; Perrett et al. 2002), and that masculine-faced men may be more financially successful (Rule and Ambady 2008, 2011), and we can safely assume that offspring in richer households anticipate greater spending by their parents. This combination of findings presents an alternative pathway by which women with more masculine, richer fathers might anticipate greater financial investment from their rich father, and might also have stronger preferences for more masculine men, who look like their father. Future research might check whether our findings hold when controlling for parental income. It is possible too that there are underlying factors that shape both the women's facial masculinity preferences and also their behaviours in answering our questions around grandparental investment, although we are not aware of an immediately obvious way by which such factors could explain away our findings. We note that asking women for their prediction of future grandparental investment from the women's parents is a noisy measure of likely actual investment, although the women's perceptions of future investment is arguably more relevant than actual investment, as the woman only has access to knowledge of the

former (predicted rather than actual parental investment) during mate choice. A conceptual replication using different measures would help uncover whether some aspect of our methodology could have influenced the results or obscured further relationships.

Grandparental care seems to be a factor in people's decisions to have children. Participants' reports at age 30 of the frequency with which they saw their own parents, and how close they were to their parents, was associated with an increased likelihood of the participant bearing a child over the next five years, in a 1970 British cohort study (Waynforth 2012). Similarly, contact with paternal grandparents was associated with a higher probability of parents having a second child, although contact with maternal grandparents was associated with a lower probability of having a third or subsequent child (Tanskanen et al. 2014). Again, maternal and paternal grandparental childcare increased the likelihood of additional grandchildren in the Netherlands, although involvement of the paternal grandparent alone decreased the odds of having another child (Thomese and Liefbroer 2013). The odds of women having a second child were increased if they received childcare from relatives, and if they had more relatives who were frequently contacted and emotionally close (Mathews and Sear 2013). Emotional support and childcare assistance provided by grandparents was associated with increased fertility intentions in some (but not all) European countries (Tanskanen and Rotkirch 2014). However, while receiving emotional support correlated with a higher likelihood of second birth, receiving practical support was linked to a lower probability of a second birth (Schaffnit and Sear 2017). Thus, overall, there is a mixed picture of whether grandparental care enhances or reduces people's decisions to have more children. The decision to have a child or more children is different from the decision to start a relationship with someone, and indeed different from initial attraction to someone, which is more the focus of our research study, but nevertheless, it might be that the mixed pattern of the impact of grandparental care on childbearing is relevant to our findings of only a small effect in relation to only one of the six variables that we investigated.

Our participants' estimation of likely future grandparental investment varied, although notably, their estimates tended to correspond across the different types of investment (i.e. there were significant intercorrelations between different types of investment from each grandparent, and also across the grandparents). Were people accurate in their estimates? Data collected in the UK Millennium Cohort Study, a large nationwide study of children born between 2000-2002, showed that three-quarters of the parents reported receiving financial support from the grandparents, and over two-thirds of the parents reported grandparental contact at least monthly (Emmott and Mace 2015). A nationally representative study of Americans found that mean grandchildcare was around 5 – 7 hours per week from each grandparent, and mean grandchild financial help totalled around 75 – 95 USD per week from each grandparent (Ho 2015). Thus, our participants' expectations of grandparental investment seems likely to be at least somewhat realistic.

Our participants also anticipated that the grandmother would provide more time and money and become more emotionally close to future offspring, compared to the grandfather. This is in line with many previous findings. Maternal grandmothers provide more than maternal grandfathers in terms of reported contact, closeness, and care (e.g. Bishop et al. 2009; Bridges et al. 2007; Chrastil et al. 2006; Uhlenberg and Hammill 1998; Laham et al. 2005; Pollet et al. 2009; Michalski and Shackelford 2005). This difference between grandmothers and

grandfathers has been explained with reference to paternity uncertainty: paternity testing aside, only women can be sure that they are related to their purported biological children, and to the grandchildren as born by their daughters, and this seems to be reflected in behaviours and relationships.

In conclusion, we found that women's anticipations of financial investment from their fathers corresponded to their preferences for facially masculine men, with small effect size. We benefitted from a large sample, and believe that our results would generalise to a broadly-matched population (i.e. a contemporary sample with a similar cultural background) in a direct replication. However, given the small effect size and mixed pattern of results (i.e. five of our predictor variables were not related to facial masculinity preferences), further research would be needed to determine whether any relationship between parental investment and facial masculinity preferences would be increased or attenuated in a conceptual replication where the measures were varied, or in slightly different samples, such as women with different cultural expectations of kin care of offspring. We also found that our participants anticipated significant investment in their offspring from the women's parents (i.e. the grandparents of the offspring), particularly from the grandmother. This anticipation is likely to be at least somewhat realistic, and, given previously demonstrated cross-cultural patterns of grandparental investment (e.g. Bishop et al. 2009; Bridges et al. 2007; Chrastil et al. 2006; Uhlenberg and Hammill 1998; Laham et al. 2005; Pollet et al. 2009; Michalski and Shackelford 2005), our findings in this regard are likely applicable universally.

Declarations

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Conflicts of interest/Competing interests: The authors declare that they have no conflict of interest.

Ethics approval: The project was granted ethical approval by the Northumbria University Department of Psychology Ethics Committee.

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

Consent for publication: Not applicable.

Availability of data and material: Data and materials are available on the OSF (https://osf.io/hkuwq/).

Code availability: Not applicable.

Authors' contributions: TKS: conceptualisation, methodology, formal analysis, writing – original draft, visualization, supervision, funding acquisition. CEL: methodology, software, formal analysis, investigation, resources, data curation, writing – review and editing, project administration. JH: formal analysis, writing – review and editing, visualization.

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Figure Captions

Fig. 1 Example stimuli pairs, manipulated to be lower (left) or higher (right) in masculinity

Table 1: Pearson's correlations [with bias corrected and accelerated 95% confidence intervals, based on 2000 bootstrap samples] between the participants' perceptions of the types of investment that they would receive from their parents (i.e. the potential grandparents). Results in bold survive Bonferroni correction for multiple comparison ($p < .003$).

	timeGM	loveGM	moneyGF	timeGF	loveGF
moneyGM	***r* = .33 [.23 – .42], *p* < .001**	*r* = .14 [.00 – .25], *p* = .006	***r* = .78 [.68 – .85], *p* < .001**	***r* = .25 [.15 – .35], *p* < .001**	*r* = .13 [.02 – .24], *p* = .013
timeGM		***r* = .23 [.13 – .31], *p* < .001**	***r* = .33 [.22 –.43], *p* < .001**	***r* = .75 [.65 – .82], *p* < .001**	*r* = .06 [-.05 – .17], *p* = .264
loveGM			*r* = .10 [.01 –.17], *p* = .046	*r* = .12 [.02 – .22], *p* = .018	***r* = .46 [.34 – .59], *p* < .001**
moneyGF				***r* = .36 [.26 – .46], *p* < .001**	***r* = .28 [.20 – .36], *p* < .001**
timeGF					***r* = .37 [.30 – .44], *p* < .001**

Table 2: Mixed-effect regression models of women's facial masculinity preferences. Note: 'shift in average masculinity preference' represents the predicted shift when the predictor increases by 1SD and all other predictors are held constant at zero.

Model	Predictor(s)	logit	Shift in average masculinity preference	*p*	Deviance	*df*
1					5188.8	5481
	moneyGM	-0.22	-3.2%	.041		
	timeGM	-0.22		.065		
	loveGM	0.17	+2.2%	.048		
	moneyGF	0.38	+4.6%	.001		
	timeGF	0.14		.254		
	loveGF	-0.14		.141		
2					5199.4	5482
	moneyGM	0.05		.505		
	timeGM	-0.21		.079		
	loveGM	0.13		.133		
	timeGF	0.18		.155		
	loveGF	-0.07		.498		
3					5198.5	5486
	moneyGF	0.16	+2.1%	.019		