

Men Do not Have a Stronger Preference than Women for Self-resemblant Child Faces

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Abstract Are men more likely than women to take into account a child's facial resemblance to themselves when making hypothetical parental investment choices? The benefits of self-resemblance in decreasing relatedness uncertainty are larger in men than in women for direct descendants. However, they are identical in men and women for collateral relatives, such as siblings, cousins, nephews, and nieces; these individuals can also be the recipients of parental-like altruism, which comes primarily from women. Published data are contradictory. In the present study, 14 men and 14 women were shown child faces and asked to judge their attractiveness, adoptability, and familiarity. The faces had been digitally manipulated to resemble (at three different resemblance levels, two of which were under recognition threshold) either the experimental participant, an acquaintance, or strangers. We found a significant preference for self-resemblant children in women, but not in men. This was not an artefact of women being better at detecting self-resemblance, given that at the highest resemblance level more men than women recognized themselves. Overall, face preference increased with face familiarity; for self-resemblant faces, this correlation was not mediated by conscious self-recognition. We discuss how the fast-response, multiple-question procedure used in previous experiments may have led to reports of a much larger self-resemblance preference in men than in women.

Keywords Facial resemblance · Paternal investment · Paternal uncertainty · Cuckoldry · Sex differences

Introduction

Both men and women are attracted to faces that look like their own (DeBruine, 2004a) and to faces that look familiar (Rhodes, Jeffery, Watson, Clifford, & Nakayama, 2003). There is disagreement, however, on whether they react differently to self-resemblance in children's faces. Platek, Burch, Panyavin, Wasserman, and Gallup (2002; see also Platek et al., 2003) reported that men were more likely than chance, and more likely than women, to choose a child face that had been morphed with their own as the most attractive. Men were also more likely than chance, and more likely than women, to select the self-morphed face when asked which child they would consider for adoption and for spending time with or money on. Platek et al. (2004) replicated the sex difference and reported different brain activation in men and women presented with self-morphed images. In contrast, however, DeBruine (2004b) found that children's facial resemblance increased attractiveness and hypothetical investment for men and women to about the same extent, with a slight, though nonsignificant, advantage for women.

People may respond positively to self-resemblance because of familiarity with their own image (e.g., Zajonc, 1968) or because of a self-serving bias; for example, we rate our own bodies as more attractive than others rate them (Jansen, Smeets, Martijn, & Nederkoom, 2006). In general, self-serving biases are probably adaptive, but in this article we are interested in the specific hypothesis that male preference for self-resemblant children is stronger than female preference. In most cultures, men receive a great deal of verbal reassurance about their resemblance to their offspring, even though newborns do not resemble their fathers more than their mothers (Bressan, 2002; Bressan & Grassi,

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2004). Of course, such reassurance serves an important function: men do tend to invest more in self-resembling children (Apicella & Marlowe, 2004). Reduction of paternal uncertainty through allegations of resemblance is, therefore, in the best interest of all parties—children, mothers, and, arguably, even fathers (Bressan, 2002). For this reason, men could be especially susceptible to bias when estimating children's resemblance to self. Indeed, when hypothetically choosing a child for adoption, men report that the selected child resembles themselves more than women do (Volk & Quinsey, 2002). Also, when judging resemblance of children to adults, men inflate resemblance to a male adult specifically when they are led to believe that this adult is the father of the child (Bressan & Dal Martello, 2002).

Because of cuckoldry risks, then, putative fathers could use self-resemblance in children's faces to assess the probability that the child is carrying their genes. On the other hand, although they know their own offspring, women would also want to invest more on children who are more likely to carry their genes. For example, residential proximity being equal, maternal grandmothers—who are certainly related to their daughters' offspring—provide a larger amount of care to their grandchildren than paternal grandmothers, who are less certainly related to their sons' (alleged) offspring (Euler & Weitzel, 1996). Every male that appears in the relatedness line between a woman and a child introduces one degree of uncertainty in their genetic link, and with it a self-resemblance benefit. The costs paid by men and women are identical for all collateral relatives, such as siblings, cousins, nephews, and nieces.

In summary, from a theoretical standpoint, it seems straightforward to predict that children who resemble us should be preferred over children who do not, but less straightforward to derive whether men and women should differ. From an empirical standpoint, a male advantage has been reported (Platek et al., 2002, 2003) but not replicated (DeBruine, 2004b). DeBruine's (2004b) method was similar to Platek et al.'s (2002, 2003), in that the participant's face was morphed with the face of a child in a 50% proportion, the morph was presented along with four others on a computer monitor, and participants selected only one. Nonetheless, the percentages of men and women who picked the self-morph as the most attractive (where 20% would be expected by chance) were 30% and 37%, respectively, in DeBruine (2004b), as opposed to 85% and 35% in Platek et al. (2002) and to 70% and 25% in Platek et al. (2003).

In our study, we tested the hypothesis of a sex difference using a method that was new in several important respects:

1. We examined how judgments varied along a continuum of resemblance (25%, 40%, and 50%), and measured whether and when self-recognition occurred. Whether self-recognition can influence the attractiveness of self-resembling faces has never been tested. The morphing procedure used by DeBruine (2004b) differed from that used by Platek et al. (2002, 2003, 2004) in that the adult face was first

transformed to have neotenus proportions before morphing. Because of this, self-recognition would have been more likely in Platek et al.'s stimuli than in DeBruine's and, because of the higher distinctiveness of male facial traits (female faces are more child-like, see Zebrowitz, 1997), self-recognition may have occurred more easily for men than for women, generating a sex difference.

2. For each stimulus face, we measured not only attractiveness and adoptability (i.e., willingness to consider that child for adoption), as in previous studies, but also familiarity. On the grounds that male facial traits are more distinctive, in Platek et al.'s studies self-morphs could have looked more familiar to men than to women, again generating a sex difference.
3. We used as stimuli child faces morphed not only with the face of the participant and with faces of strangers, but also with the face of a genetically unrelated individual familiar to the participant. This made it possible to test the importance of familiarity and self-resemblance separately.
4. We used both ranking and rating measures. In previous studies, only one face was chosen from a small set, but a full ranking of all the faces in the set is, of course, more informative (e.g., the self-morph could be selected as second best). A rating procedure can indicate how large the preference for the self-morph is relative to the alternatives, and this analysis can be done separately for male and female participants.

Method

Participants

A total of 28 participants (14 men, M age 25.5 ± 2.3 years; range, 21–30, and 14 women, M age 24.2 ± 2.0 years; range, 19–27) took part in the study. They had all the same ethnicity (Italian) and were recruited from people known to the experimenters but unconnected to the research project. None of them was a psychology student and none were familiar with this kind of research. Fifteen participants had a partner and 13 were single. None had children.

Measures and Procedure

Participants were informed that they were taking part in a study concerning the effects of facial traits on attractiveness judgments, and that their photographs had to be taken because their faces would be used as stimuli for other participants. Men were asked to attend at the appointed time shaved and women were asked not to wear make-up; spectacles and jewels were removed before the photograph was taken and long hair was tied back. Participants were asked to assume a neutral expression. Images were captured

with a digital camera from a distance of 70 cm, in a fully lit room. The 28 faces were morphed with the face of a 1-year-old female child using Winmorph 3.01. The morphing program allowed us to set reference lines to merge the two images into one. For each face, we prepared three different morphs, containing respectively 25%, 40%, and 50% of the self face (see Fig. 1). All morphs in each set were given the same hair, to rule out the potential role of hair color or style in preference or self-recognition.

For each participant, and unbeknown to him or her, a second individual of the same age, whose face was familiar to the participant, was identified. This person (“acquaintance”) was someone whom the participant saw at least twice a week, in most cases every day. The acquaintance was never a partner nor a relative of the participant. Digital images of acquaintances were collected and processed following the procedure described above. Each of the 168 final images (28 participants plus 28 acquaintances, 3 morph levels each) was then printed, in greyscale, on separate 10 × 13 cm cards.

Each participant was shown three sets of six images. Each set consisted of a self-morph (child plus participant), an

acquaintance-morph (child plus acquaintance), and four stranger-morphs (child plus another participant). Each self-morph was presented an equal number of times as a stranger-morph; apart from that, stranger-morphs were randomly selected for each participant (and the same stranger-morphs were used across morph levels).

The set presented first was composed entirely of 25% morphs, the second of 40% morphs, the third of 50% morphs. The images of each set were placed in random order on a table in front of the participant, who was told that they had been obtained by digitally manipulating different facial features of a single original picture. Participants were asked to rank the faces (1st to 6th, by rearranging the pictures on the table) in response to three questions: (1) How attractive do you find each child, (2) How willing would you be to adopt each child, and (3) How familiar does each child look to you? After ranking the six images in response to each question, participants were asked to rate them on a 11-point scale, from 0 = not at all to 10 = very much. The order of sessions was counterbalanced between subjects and the cards were shuffled each time. Identical ratings for different faces were allowed.

At the end of each session and for each set, participants were also asked to assess the difficulty of the task on a five-point scale (from 1 = easy to 5 = difficult). At the end of the experiment, we collected information on whether, and at which level of morphing, participants had recognized themselves or their acquaintance among the faces. The final debriefing showed that, during the experiment itself (up to the presentation of the last set, with the 50% morphs), none of the participants had guessed what the study was about.

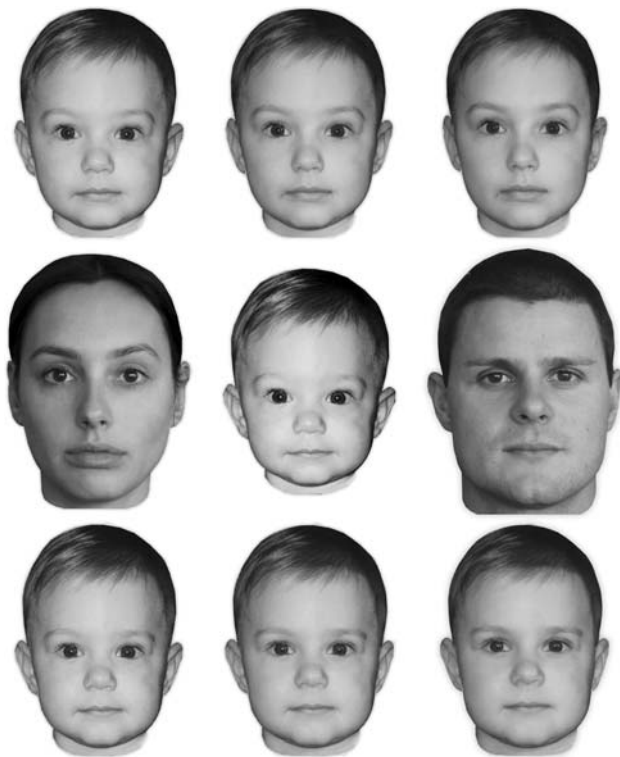


Fig. 1 The child model was a 1-year-old female (middle row, center), here shown together with an adult female and an adult male used as examples (middle row, left and right). The child face was morphed with the adult face, and from the morphing sequence three images were selected for the experiment. The morphs in the top and bottom rows contain 25%, 40%, and 50% of, respectively, the adult female and male faces. The stimuli actually used in the experiment are available from the corresponding author upon request

Results

Ranking

From the ranking data, we extracted the information about how many participants had assigned the top rank to the self-morph, the measure used in previous work. Binomial tests are reported in Table 1. By chance alone, the self-morph would be selected 16% of the time (1 out of 6). Both men and women chose self-morphs above chance in the familiarity task, increasingly so for higher percentages of self. At the 50% level, the self-morph was chosen as the most familiar by 71.4% of both male and female participants.

Men never chose the self-morph above chance in either the attractiveness or adoptability tasks (all $ps > .19$), whereas women did so for both attractiveness (at the 25% and 40% levels, $p < .02$) and adoptability (at the 40% level, $p < .0001$).

After analyzing top ranks, we considered the ranks assigned to all faces, comparing responses to self-morphs and

stranger-morphs by means of Wilcoxon Signed Ranks tests (see Table 2). Both men and women ranked self-morphs higher than stranger-morphs for familiarity at the 40% and 50% levels. Men never ranked self-morphs significantly higher than stranger-morphs in the attractiveness and adoptability tasks, whereas women did for both attractiveness (at the 40% level) and adoptability (at all levels).

The pattern of Table 2 (rankings for self-morphs compared to rankings for stranger-morphs) was fully consistent with that of Table 1 (percentage of times the top rank was assigned to self-morphs). For men, there was never a significant preference for self-morphs, but for women the preference was clear, especially at the 40% level.

Rating

In our analyses, we never found a significant difference between participants with or without a partner; hence, this factor will not be mentioned further. We analyzed the rating data via a repeated-measures ANOVA with task (attractiveness and adoptability), morph type (self, acquaintance, and stranger), and morph level (25%, 40%, and 50% of self in the morph) as within-subjects factors. Of the 28 participants, 12 (8 men and 4 women) noticed the resemblance of one face to their own face at the 50% level; nobody ever noticed the resemblance to the acquaintance. We used self-recognition (present or absent) as a between-subjects factor.

Morph level was significant, $F(2, 52) = 11.23, p < .001$, indicating that, as the percentage of adult traits increased (making the face less infant-like), the attractiveness of the face and the willingness to adopt the child decreased. Morph type was also significant $F(2, 52) = 3.19, p = .049$, with highest values for self-morphs. Task (attractiveness vs. adoptability) and self-recognition were not significant, nor was there any significant interaction. In subsequent analyses, we therefore combined attractiveness and adoptability into a single variable, which we called *investment*. Investment data

for self-morphs and stranger-morphs are depicted in Fig. 2, at the three morph levels, separately for men and women.

Familiarity was analyzed with an ANOVA that had morph type and level as within-subjects factors, and self-recognition as the between-subjects factor. Familiarity depended on morph type, $F(2, 52) = 21.82, p < .001$, being highest for self-morphs and lowest for stranger-morphs. There was an interaction between morph type and morph level, $F(4, 104) = 7.07, p < .001$: with increasing percentage of adult traits, familiarity increased for self-morphs and decreased for stranger-morphs. In separate post-hoc tests, we confirmed that, for self-morphs, familiarity increased linearly, $F(1, 27) = 12.58, p = .001$, and that, for stranger-morphs, it decreased linearly, $F(1, 27) = 4.98, p = .034$.

Familiarity ratings of self-morphs were higher for the participants who recognized themselves in the pictures and this was specific for the 50% level (the level at which self-recognition occurred), leading to a significant three-way interaction between morph type, morph level, and self-recognition, $F(4, 104) = 4.76, p = .013$. Across morph levels, controlling for self-recognition, investment in self-, acquaintance-, and stranger-morphs correlated positively with their rated familiarity, respectively, $r_p = 0.44, df = 25, p = .021$, $r_p = 0.36, df = 25, p = .067$, and $r_p = 0.50, df = 25, p = .008$.

Finally, we compared men and women in their preferences for the self and the acquaintance. As a measure of such preferences, we computed the difference between the investment ratings for self- (or acquaintance-) morphs and stranger-morphs, at both the 40% and 50% levels (see Fig. 3). The *t*-tests reported below were one-tailed, and represent the pre-planned paired comparisons derived from the hypothesis that self- and acquaintance-similar faces are preferred to stranger faces. For men, there was never a significant preference for either self-morphs or acquaintance-morphs. For women, the preference for self-morphs was significant at both the 40% level, $t(13) = 2.65, p = .01$, and the 50% level, $t(13) = 2.50, p = .013$; the preference for acquaintance-morphs reached significance at the 40% level, $t(13) = 1.91, p = .04$.

Table 1 Percentage of men and women who assigned the top rank to the self-morph for each of the three questions

Variable	Sex	Percentage of self in the morph					
		25%		40%		50%	
		%	<i>p</i>	%	<i>p</i>	%	<i>p</i>
Attractiveness	Men	28.6	ns	7.1	ns	28.6	ns
	Women	42.9	.019	42.9	.019	21.4	ns
Adoptability	Men	14.3	ns	28.6	ns	14.3	ns
	Women	35.7	.068	64.3	.001	35.7	.069
Familiarity	Men	28.6	ns	50	.004	71.4	.001
	Women	42.9	.019	64.3	.001	71.4	.001

Note. *p* values were calculated using an exact binomial test with a chance value of 16.6%

Table 2 Comparison of ranks for self-morphs and stranger-morphs

Variable	Sex	Percentage of adult in the morph					
		25%		40%		50%	
		Z	p	Z	p	Z	p
Attractiveness	Men	-1.34	.09	-0.64	Ns	0	.05
	Women	-1.41	.078	-2.14	.016	-1.37	.084
Adoptability	Men	-0.87	ns	-1.32	.092	-0.17	ns
	Women	-1.67	.047	-2.45	.007	-1.82	.034
Familiarity	Men	-0.85	ns	-2.79	.002	-2.85	.002
	Women	-0.91	ns	-1.82	.034	-2.39	.008

Note. Z scores and probabilities were calculated using Wilcoxon Signed Ranks tests. Since self-resemblance was predicted to increase attractiveness, adoptability, and familiarity, one-tailed p values are reported

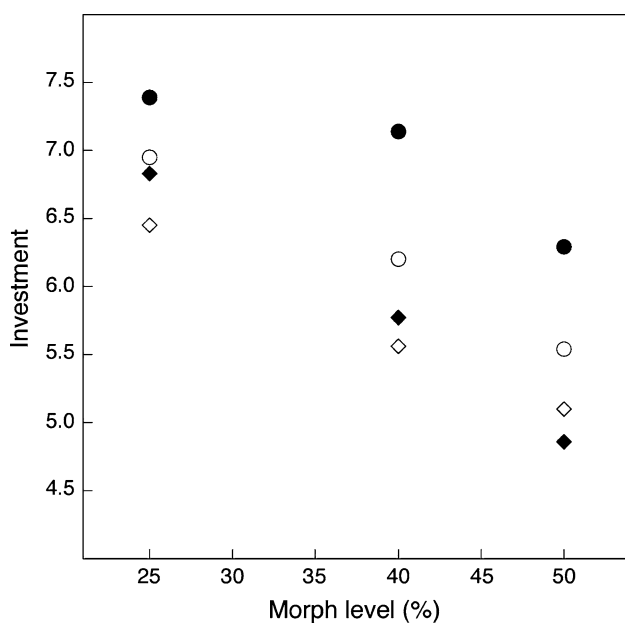


Fig. 2 Mean investment (average of attractiveness and adoptability ratings, on a 0–10 scale) for self-morphs (circles) and stranger-morphs (diamonds), plotted separately for women (solid symbols) and men (open symbols). The vertical distance between each pair of solid (open) symbols hence represents the size of the effect for women (men). Error bars are not shown to avoid crowding

The stranger-morphs in each set were obtained from the faces of other participants of either sex. Because male faces have sharper, less child-like features than female faces, men may have preferred female morphs (i.e., child morphed with female participants) within each stimulus set. In this case, their lack of self-preference would simply be an artefact of an overall avoidance of male morphs. To test this potential confound, we compared the ratings given by our participants to male and female stranger-morphs. For men, there was no significant preference for female over male stranger-morphs at any morph level; actually, the overall means went very slightly in the opposite direction (mean ratings were, respectively, $5.39 \pm SE$

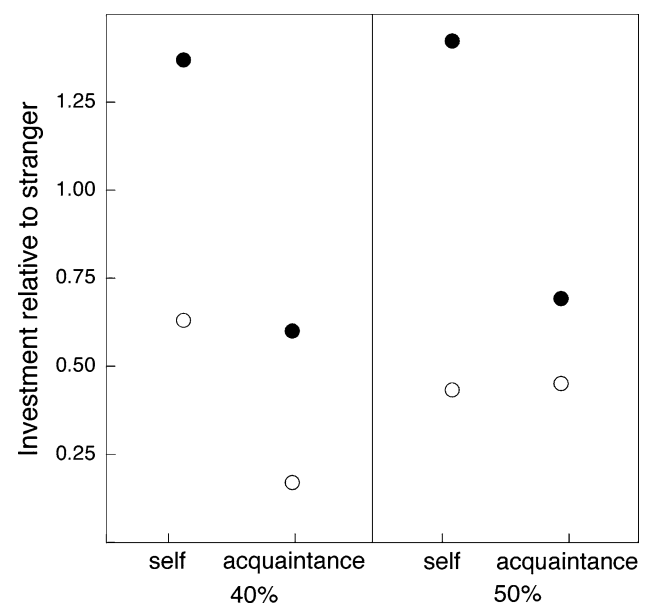


Fig. 3 Mean investment for self and acquaintance relative to stranger, for morphs containing 40% and 50% of adult face. Data points are, respectively, the average of self-morph ratings minus stranger-morph ratings and the average of acquaintance-morph ratings minus stranger-morph ratings, plotted separately for women (solid symbols) and men (open symbols). All error bars ($\pm 1 SE$, not shown to avoid crowding) are overlapping

0.65 and $5.63 \pm SE 0.56$). For women, there was a marginally significant preference for female over male stranger-morphs at the 50% level. At the morph level for which female self-preference was clearest, 40%, neither men nor women favored female over male stranger-morphs, both $t_s < 1$. Hence, the female preference for self-morphs was not an artefact of a general aversion to male stranger-morphs, either.

Difficulty Judgments

Difficulty ratings for investment (average between difficulty ratings for attractiveness and adoptability) decreased with

morph level, $F(2, 52) = 3.31, p = .044$; reasonably, at higher levels, the choice was easier because faces differed more from one another. Difficulty ratings for familiarity also decreased with morph level, $F(2, 52) = 14.30, p < .001$, that is, with the proportion of familiar traits in the face.

We examined difficulty judgments in more detail at the most representative morph level, 40% (just below the recognition threshold). For investment, there was a strong negative correlation between difficulty ratings and preference for self-relative to stranger-morphs, Spearman's $r_s = -0.45, N = 28, p = .016$. This means that participants who showed greater preference for self-morphs found the task easier. Interestingly, men tended to find investment choices more difficult than women, $t(26) = 1.90, p = .069$, as also apparent in Fig. 4.

Discussion

We found a preference for self-morphs in women and little or no preference in men. For women, child faces resembling acquaintances were also preferred to faces of strangers, but this effect was weaker than the preference for faces resembling the self.

Like us, DeBruine (2004b) also reported a failure to replicate the larger preference of men for self-resemblant children found by Platek et al. (2002, 2003). To account for the discrepancy between her data and Platek et al., DeBruine considered a number of possible explanations, many of which we can now rule out. Unlike Platek et al., DeBruine presented only same-sex morphs to participants, used different faces for each question,

and employed a morphing procedure that made the faces look like infants, as opposed to children. Although these methodological differences are potentially important, like Platek et al., we used the same rather than different faces for each question, mixed-sex rather than same-sex morphs, and faces that looked like children rather than infants; yet, we did not replicate Platek et al.'s findings.

Overall, we found a significant preference for self-resemblant faces. DeBruine (2004b) reported a weaker effect—statistical significance was barely reached, although she had a larger sample. We can see two reasons for this: first, compared to ours, DeBruine's method was less powerful, because it was limited to picking one face in each set; second and more importantly, compared to ours, DeBruine's morphs were less resemblant to the adult participant, due to the procedure of turning the adult faces into infant-like faces prior to morphing. Indirect but telling evidence for this is that none of DeBruine's participants recognized themselves in the 50% morphs, whereas nearly half of our participants did.

An unexpected result of our study was that the appeal of self-resemblant children was statistically significant for women, but not for men. Although DeBruine (2004b) reported no significant difference between the sexes, inspection of her data shows indeed the same trend. For two questions out of five, there was no effect whatsoever for either sex, but for the other three questions the percentage of women who chose the self-morph was significant or bordered on significance, whereas men did not pick the self-morph more often than chance.

Why have similar studies (Platek et al.'s on one side, DeBruine's and ours on the other) found so strikingly diverging results? Close comparison reveals that two clear differences remain between the two blocks of experiments. First, in Platek et al. (2002, 2003, 2004), a large number of trials was presented to each participant (20, 70, and 30 trials), as opposed to five trials in DeBruine (2004b) and nine trials in our experiment. Presented with a long computerized test of this kind, male and female undergraduates may adopt different strategies, with men tending to select a response faster than women—as was actually the case in Platek et al.'s experiments. Many factors can affect the choice of a given face among others, but, when selection takes place very rapidly (for the men who took part in the *shortest* of Platek et al.'s experiments, i.e., the one with 20 trials, the mean exploration time for each face was less than 2 s), a vague sense of familiarity is possibly the strongest one. People have this experience when a target cues a feeling of knowledge, although no additional confirmatory information can be recalled. This sense of familiarity can be dissociated from recollection and, because it emerges earlier (Cleary & Greene, 2005; Yonelinas, 2002), is less likely to be masked by other factors when responses are fast. This could explain the amazingly large preference for self-morphs in Platek et al.'s men (70–90% for the attractiveness and adoptability questions), and the failure to replicate this near-unanimity in DeBruine (2004b), where the trials were

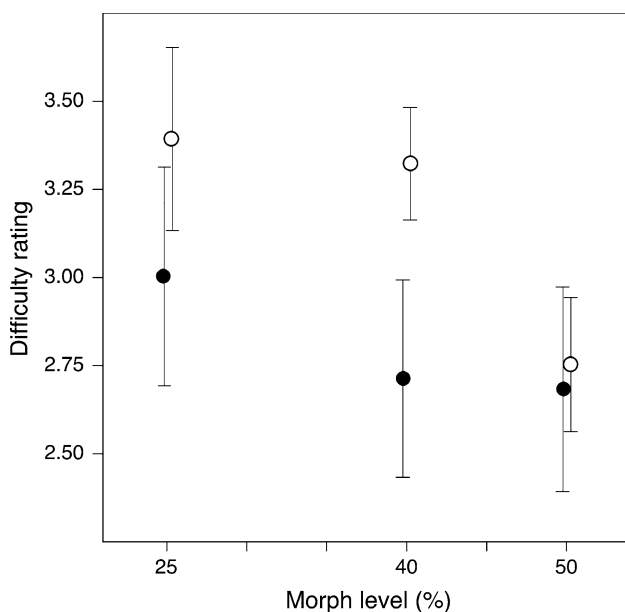


Fig. 4 Mean difficulty rating for investment, on a 1–5 scale, plotted separately for women (solid symbols) and men (open symbols). Error bars indicate the SEM

very few, and in the current study, where participants had to spend time handling and ranking a set of cards.

The second obvious difference between the two blocks of studies is that in Platek et al. (2002, 2003, 2004) 10 separate questions, all implying preference, were asked for each set of faces, as opposed to one question implying preference for each set of faces in DeBruine (2004b), and two questions implying preference for each set of faces in our experiment. As remarked by DeBruine (2004b), and supported by independent evidence (e.g., Austin & McGinn, 1977), men and women may differ in their willingness to spread their preferences across a set of faces, with women less likely to select the same face too many times. Such reluctance could have masked the female preference for self-morphs in Platek et al.'s studies.

This hypothesis is supported by at least three separate lines of evidence. First, Platek et al.'s female participants did report that they tried to select different faces from trial to trial (see DeBruine, 2004b). Second, Platek et al.'s female participants took significantly longer to select faces than males, and found the task significantly more difficult than males. This is consistent with the idea that they often tried to pick a face other than the one they would have "instinctively" preferred. Third, in our experiment, female participants found the task *easier* than males. This agrees with the idea that their preference for the self-morph was stronger *and* did not need to be inhibited; indeed, reported task difficulty and self-morph preference correlated negatively and significantly in our sample.

The preference for self-morphs that we found in women but not in men cannot be due to our female participants being better at detecting self-resemblance in child faces, given that more men than women ended up recognizing themselves. The positive correlations we found between investment and familiarity, even when self-recognition was partialled out, indicate that the effect does not depend on conscious self-recognition. However, our data are fully consistent with the idea that familiarity increases liking (e.g., Peskin & Newell, 2004) and/or liking increases familiarity (Monin, 2003). Preferential investment in self-resemblant faces may thus be mediated by their higher familiarity.

In conclusion, our findings are in line with those of DeBruine (2004b), in that self-resemblance tended to increase children's attractiveness and adoptability for both men and women, but the trend was for a larger effect in women. We suggest that this data pattern was obscured by the procedure (long sessions and many questions asked about the same set of faces) used in Platek et al.'s (2002, 2003, 2004) research.

Favoritism towards self-resemblant children must have paid dividends to both sexes in our evolutionary history. This is obvious for children whose relatedness to oneself is undetermined (e.g., those who are related through a male, such as the putative children of one's brother or son). It might even be argued that, if phenotypic similarity is unconsciously and automatically treated as a proxy for genetic similarity, differential degrees of

phenotypic similarity could affect preferences even within the family. In other words, a parent may tend to favor the most self-resemblant child even when parenthood is certain. In harmony with this view, it has been shown that the intensity of grief for a lost child is a function of the degree of perceived self-similarity with the child itself, for *both* fathers and mothers (Littlefield & Rushton, 1986).

Volk and Quinsey (2002) have suggested that, given that women provide the majority of care to children, the costs of investing in any given child are greater for women than for men, making women more responsive to cues of infant quality. They showed that, in a hypothetical adoption context, female choice was influenced by proxies for infant quality, such as facial cues of health and cuteness, to a larger extent than male choice was. For women, but not for men, cuteness (defined as infant attractiveness to parentally motivated adults) was actually the primary factor. There was no significant difference between attractiveness and adoptability ratings in our experiment, meaning that participants preferred to adopt the child that they perceived as most attractive. It might be possible to conclude that self-resemblant faces appear more attractive to both sexes, but, because the burden of raising a child and, hence, the use of such information in a cost-benefit analysis of parental investment is heavier for mothers, this increased attractiveness tends to influence the choices of women more than those of men.

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