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Preference for attractive faces in human infants extends beyond conspecifics

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Abstract

Human infants, just a few days of age, are known to prefer attractive human faces. We examined whether this preference is human-specific. Three- to 4-month-olds preferred attractive over unattractive domestic and wild cat (tiger) faces (Experiments 1 and 3). The preference was not observed when the faces were inverted, suggesting that it did not arise from low-level image differences (Experiments 2 and 3). In addition, the spontaneous preference for attractive tiger faces influenced performance in a recognition memory task involving attractive versus unattractive tiger face pairings (Experiment 4). The findings suggest that infant preference for attractive faces reflects the activity of general processing mechanisms rather than a specific adaptation to mate choice.

Introduction

Human infants prefer to look at physically attractive human faces when they are paired with physically less attractive human faces (Langlois, Roggman, Casey, Ritter, Rieser-Danner & Jenkins, 1987). Infant preference for attractive faces has been observed for a range of human faces, including Caucasian and African American adult female faces, adult male faces, and infant faces (Langlois, Ritter, Roggman & Vaughn, 1991; Samuels & Ewy, 1985; Van Duuren, Kendell-Scott & Stark, 2003). The attractiveness effect can be demonstrated even in newborn infants, is orientation dependent, occurring for upright but not inverted faces (Slater, Quinn, Hayes & Brown, 2000), and is driven by the internal features of faces (Slater, Bremner, Johnson, Sherwood, Hayes & Brown, 2000).

A major unanswered question concerning the basis for the attractiveness effect in infants is tied to the larger discussion of whether judgments of facial beauty reflect an adaptation for mate choice or are simply a by-product of general information processing mechanisms (Basolo, 1990; Cornwell, Boothroyd, Burt, Feinberg, Jones, Little, Pitman, Whiten & Perrett, 2004; Ghirlanda, Jansson & Enquist, 2002; Halberstadt & Rhodes, 2000; Rhodes, 2006; Symons, 1979; Thornhill & Gangestad, 1999). A human-specific attractiveness preference would make evolutionary sense because attractive faces advertise a number of traits about an individual including fitness, and what is considered fitness may be different for different species (Etcoff, 1999; Geary, 1988). In addition, a human-specific attractiveness preference could provide a

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bestiality avoidance mechanism. Alternatively, it could be that there is a general preference for attractive mammalian faces. In other words, there is something common across all mammalian faces that makes an exemplar attractive and different from an unattractive exemplar.

In the present study, we examined whether young infants, 3 to 4 months of age, would display an attractiveness effect for nonhuman animal faces (i.e. domestic cats in Experiments 1 and 2, and tigers in Experiments 3 and 4). Evidence on how infants respond to the attractiveness of nonhuman animal faces provides data that is relevant to the debate over whether the attractiveness preference reflects an adaptation for mate choice or is merely an offshoot of general information processing mechanisms. In particular, if the attractiveness effect reflects an adaptation for mate choice, then one would expect it to occur only for conspecific faces. However, if the attractiveness effect is an outgrowth of general perceptual or cognitive mechanisms, then it would not be expected to be human-specific.

Experiment 1

In Experiment 1, a group of 3- to 4-month-old infants was presented with four 10-s preference trials, each of which paired a different attractive cat face with a different unattractive cat face.

Method

Participants—The participants were 20 3- to 4-month-olds (nine females) with a mean age of 106.95 days, *SD* = 8.33 days. None of the infants in this and the subsequent studies to be reported had a cat in their household or had prior visual experience with a cat (according to parental report).

Stimuli—The stimuli consisted of photographic, colored images of 10 cat faces, five judged by adults as unattractive and five judged by adults as attractive. These stimuli were selected from an original pool of 32 cat face stimuli. Twenty adults (10 female) rated the 32 faces for attractiveness using a 1 to 5 Likert scale (1 = very unattractive, 5 = very attractive). Mean ratings for the unattractive and attractive faces were 2.40 (*SD* = 0.35) and 4.14 (*SD* = 0.27). Examples of the attractive and unattractive cat faces (in grayscale) are depicted in the top panel of Figure 1.

Apparatus—All infants were tested in a visual preference apparatus, modeled after the one described by Fagan (1970). The apparatus has a display panel onto which were attached two compartments to hold the poster board stimuli. The stimuli were illuminated by a fluorescent lamp that was shielded from the infant's view. The center-to-center distance between compartments was 30.5 cm and on all trials the display panel was situated approximately 30.5 cm in front of the infant. There was a 0.62 cm peephole located midway between the two display compartments that permitted an observer to record the infant's visual fixations. A second peephole, 0.90 cm in diameter, was located directly below the first peephole, and permitted a Pro Video CVC-120PH pinhole camera and a JVC video recorder to record infants' gaze duration.

Procedure—All infants were brought to the laboratory by a parent and seated in a reclining position on the parent's lap. There were two experimenters both of whom were naive to the hypotheses under investigation. The first experimenter positioned the apparatus so that the midline of the infant's head was aligned with the midline of the display panel. The experimenter selected the appropriate stimuli and loaded them into the compartments of the display panel. The experimenter then closed the panel, thereby exposing the stimuli to the infant. The parent was unable to see the stimuli. During each trial, the first experimenter observed the infant through the peephole and recorded visual fixations to the left and right stimuli by means of two electronic stop watches, one of which was held in each hand. Between trials, the first experimenter recorded infant looking times and changed the stimuli. The second experimenter did not participate other than to time the trials and signal when a trial was to end. The two experimenters changed roles across infants.

Inter-observer agreement, as determined by comparing looking times measured by the experimenter using the center peephole, and an additional naive observer measuring looking times offline from videotape records, was calculated for the preference trials of five randomly selected infants. Average level of agreement for attractiveness preference scores was 98.37% (*SD* = 1.20).

Each infant was presented with four 10-s preference trials, each of which paired a different attractive cat face with a different unattractive cat face. The face pairings were randomly selected for each infant on each trial. The left-right positioning of the two categories was counterbalanced across infants on the first trial and reversed on each successive trial.

To provide a manipulation check on the attractiveness ratings provided by the adults and the face pairings selected for presentation to the infants, 20 adults (13 female) were presented with the same attractive and unattractive cat face pairings presented to the infants, and asked to select the member of the pair that was judged to be more attractive. These adults differed from those who provided the initial ratings. Each adult was presented with one of the 20 sets of randomly selected pairings and their orderings presented to the infants. As was the case for the infant testing, the left-right positioning of the attractive and unattractive faces was counterbalanced across participants on the first trial and reversed on each successive trial. On each trial, adults were asked to select the member of the pair that was more attractive. Adults chose the more attractive member of the pair on 74 of the 80 trials (20 participants × 4 pairings per participant) for a 92.5% correct rate, thereby providing confirmation of the attractiveness manipulation that was generated by the adult ratings and presented to the infants.

Results and discussion

A preference score for the attractive cat faces was calculated for each infant by dividing the summed looking time to the attractive faces over all four trials by the summed looking time to both attractive and unattractive faces over the four trials. This score was then converted to a percentage and averaged across infants to yield a mean preference for the attractive cat faces. The mean preference for the attractive cat faces of 61.25%, $SD = 13.22$, was reliably different from the chance preference of 50%, $t(19) = 3.81$, $p < .01$. In addition, 16 of the 20 infants displayed individual preference scores for the attractive faces above 50%, $p = .01$. The data indicate that young infants will display an attractiveness preference for faces from a species other than humans.

Experiment 2

To determine whether the attractiveness effect for cat faces is comparable to the attractiveness effect that has been observed for human faces, we examined how the attractiveness effect for cat faces is affected by stimulus inversion. When infants view inverted human faces, they no longer show an attractiveness preference (Slater *et al.*, 2000; Van Duuren *et al.*, 2003).

The inversion manipulation also allowed for an assessment of whether the attractiveness effect observed in Experiment 1 might be attributable to low-level image differences between the two sets of faces that are not necessarily diagnostic of attractiveness versus unattractiveness in cat faces in general. If the attractiveness effect is due to low-level image differences, then the preference for the attractive faces should be preserved with the inversion manipulation, given that such differences would not be affected by inversion. Alternatively, if the attractiveness effect is based on perception of the cat faces in their upright orientation, then one would expect chance responding (i.e. a no-preference result). Experiment 1 was thus repeated, but in this instance with inverted cat faces.

Method

Participants—The participants were 20 3- to 4-month-olds (11 females) with a mean age of 114.35 days, *SD* = 9.31 days.

Procedure—The procedure was identical to that of Experiment 1, except that the attractive and unattractive cat faces were inverted. Inter-observer agreement, calculated for the attractiveness preferences of five randomly selected infants, was 98.27% (*SD* = 1.41).

Results and discussion

In response to the inversion manipulation, the infants no longer preferred the attractive cat faces, *M* = 51.87%, *SD* = 18.07, *t*(19) = 0.46, *p* > .20. In addition, just nine of the 20 infants displayed individual preference scores for the attractive cat faces above 50%, *p* = .82. Moreover, when the mean attractiveness preference for upright faces from Experiment 1 was compared to the mean attractiveness preference for inverted faces from Experiment 2, the difference was significant, *t*(38) = 1.87, *p* < .05, one-tailed. Like the attractiveness preference by infants for human faces, the attractiveness preference by infants for cat faces is orientation specific. The removal of the effect with inversion also indicates that the attractiveness preference is not simply the result of some low-level image difference between the two sets of faces (e.g. sensory power).

Experiment 3

The data showing that young infants prefer attractive over unattractive cat faces supports the hypothesis that the attractiveness effect extends beyond human faces and may reflect a general preference for mammalian faces. However, such a conclusion may be premature because domestic cats are household animals that have been bred by humans as family pets. Thus, domestic cats may reflect the breeding practices of humans who have chosen to raise cats that they find attractive. Hare, Brown, Williamson and Tomasello (2002) have made an analogous argument in the domain of social cognition in proposing that dogs have the ability to read human communicative signals in ways that wolves do not because dogs have been bred to communicate with humans.

The selective breeding account would suggest that the attractiveness preference observed in Experiment 1 may represent a carry-over effect of human attractiveness. Domestic cats may fit our human definition of attractiveness or health, and young infants may generalize from their representation of attractiveness of human faces to attractive and unattractive domestic cat faces. A more stringent test of whether attractiveness preferences in infants are governed by human-specific or general-mammalian mechanisms is to determine whether infants also prefer attractive over unattractive faces for an undomesticated animal species. Therefore, in Experiment 3, we tested infant preferences for attractive and unattractive wild cat faces. Experiment 3 was effectively a replication of Experiment 1, except that the stimuli were tiger faces. An inverted control condition was again included to examine the possibility that any observed preference for the attractive faces might reflect a spurious, low-level image difference.

Method

Participants—The participants were 40 3- to 4-month-olds (17 females) with a mean age of 109.05 days, *SD* = 8.30 days.

Stimuli—The stimuli consisted of photographic, colored images of 10 tiger faces, five judged by adults as unattractive and five judged by adults as attractive. These stimuli were selected from an original pool of 32 tiger face stimuli. Twenty adults (12 female) rated the 32 faces for attractiveness using a 1 to 5 Likert scale (1 = very unattractive, 5 = very attractive). Mean ratings for the unattractive and attractive faces were 2.37 (*SD* = 0.08) and 3.97 (*SD* = 0.14). Examples of the attractive and unattractive tiger faces (in grayscale) are depicted in the bottom panel of Figure 1.

Procedure—The procedures were identical to those of Experiments 1 and 2, except that attractive and unattractive tiger faces were presented. Infants were randomly assigned to the upright and inverted testing conditions. Inter-observer agreement, calculated for the attractiveness preferences of 10 randomly selected infants, was 98.08% (*SD* = 0.95).

To provide a manipulation check on the selection of the upright attractive versus unattractive face pairings (identical to that reported in the Method section of Experiment 1), 20 adults (12 female) were presented with the same upright attractive and unattractive tiger face pairings presented to the infants and asked to choose the member of the pair that was more attractive. As was the case for the cat faces, these adults were a different sample from those who provided the initial ratings. The adults chose the more attractive member of the pair on 75 of the 80 trials (or 93.75%), thus providing independent corroboration of the effectiveness of the attractiveness manipulation.

Results and discussion

The mean preference for the upright attractive tiger faces was 61.45%, *SD* = 12.55, a value that was reliably different from chance, $t(19) = 4.08$, $p < .001$. Also, 17 of the 20 infants displayed individual preference scores for the attractive faces above 50%, $p = .001$. Moreover, when tested with inverted tiger stimuli, the infants no longer preferred the attractive faces, *M* = 52.87%, *SD* = 14.07, $t(19) = 0.91$, $p > .20$. In addition, only 11 of the 20 infants displayed individual preference scores for the inverted attractive faces above 50%, $p = .82$. Finally, when the mean attractiveness preference for upright tiger faces was compared to the mean attractiveness preference for inverted tiger faces, the difference was significant, $t(38) = 2.04$, $p < .05$. Similar to the results observed for the domestic cat faces, the infants preferred only the upright attractive tiger faces. The preference for attractive faces of nonhuman animal species is thus generalizable to undomesticated kinds.

Experiment 4

Experiment 4 was conducted to provide convergent evidence for the demonstration in Experiment 3 that 3- to 4-month-olds prefer upright attractive over unattractive tiger faces. Haith (1998) has argued that one criterion for judging the strength of an empirical phenomenon is to determine whether the phenomenon as demonstrated in one task influences performance in another task that is believed to tap the same phenomenon. To this end, we asked whether the spontaneous preference for attractive over unattractive tiger faces affects performance in a recognition memory task involving a contrast between an attractive and unattractive tiger face.

In Experiment 4, each infant was familiarized with a single attractive or unattractive tiger face for one 10-s familiarization trial and then tested with the familiar face paired with a novel face from the contrasting category on two 10-s preference trials. The particular attractive and unattractive face pairings were randomly selected for each infant. In this procedure, recognition memory for the familiar stimulus is inferred if infants display a preference for the novel stimulus (Fantz, 1964). If the spontaneous preference that infants display for attractive over unattractive tiger faces influences performance in the recognition memory task, then one would expect an asymmetrical pattern of performance (Quinn, 2002). In particular, when an infant is familiarized with an attractive tiger face and tested with an attractive versus unattractive tiger face, then a spontaneous preference for the attractive tiger face should interfere with a novelty preference for the unattractive tiger face, with the consequence of a null novelty preference for the unattractive tiger face. Conversely, when an infant is familiarized with an unattractive tiger face and tested with an unattractive versus attractive tiger face, then a spontaneous preference for the attractive tiger face should facilitate a novelty preference for the attractive tiger face, thereby giving rise to a robust novelty preference for the attractive tiger face.

Method

Participants—The participants were 20 3- to 4-month-olds (12 females) with a mean age of 114.00 days, *SD* = 8.86 days.

Procedure—Ten infants were randomly assigned to each of two familiarization conditions. In one condition, the familiar stimulus was an attractive tiger face, randomly selected for each infant, and in the other condition, the familiar stimulus was an unattractive tiger face, again randomly selected for each infant. The novel test stimuli, also randomly selected for each infant, were an unattractive tiger face for infants familiarized with an attractive tiger face, and an attractive tiger face for infants familiarized with an unattractive tiger face. The infants received a single 10-s familiarization trial during which a single tiger face was presented in both compartments of the display stage. Immediately after familiarization, each infant received two 10-s test trials pairing the familiar tiger face with a novel tiger face. The first and second experimenters changed places for the test trials. The experimenter who presented the stimulus and measured infants' fixations during the familiarization trial now measured trial duration and signaled the end of the test trials, whereas the second experimenter presented the test stimuli and measured the fixations. This ensured that the second experimenter was naive with respect to the familiar stimulus. The left-right positioning of the novel stimulus was counterbalanced across infants on the first test trial and reversed on the second test trial. Inter-observer agreement, calculated for the novelty preferences of five randomly selected infants, was 97.98% (*SD* = 1.81).

Results and discussion

Familiarization trial—Individual looking times were summed over the left and right copies of the stimulus on the familiarization trial and then averaged across infants. Mean looking time was 7.54 s (*SD* = 1.58) for infants familiarized with attractive tiger faces and 7.52 s (*SD* = 1.69) for infants familiarized with unattractive tiger faces. The difference in mean looking times was not significant, $t(18) = 0.03$, $p > .20$. This result is informative inasmuch as it indicates that the attractiveness preference is observed only when attractive and unattractive faces are paired, a finding that is consistent with a more general observation that infants are more likely to exhibit differential responding toward two classes of stimuli when those stimuli are presented paired together than when they are presented in isolation (e.g. Younger & Furrer, 2003).

Preference test trials—Each infant's looking time to the novel stimulus was divided by the looking time to both test stimuli and then converted to a percentage score. The mean novelty preference for an unattractive tiger face following familiarization with an attractive tiger face was 54.20% (*SD* = 12.54), a value that was not significantly different from chance, $t(9) = 1.06$, $p > .20$. In addition, just six of the 10 infants displayed individual preferences for the novel unattractive faces above 50%, $p = .75$. In contrast, the mean preference for an attractive tiger face following familiarization with an unattractive tiger face was 65.33% (*SD* = 12.80), a result that was reliably different from chance $t(9) = 3.39$, $p < .02$. Also, nine of the 10 infants displayed individual preferences for the attractive faces above 50%, $p = .02$. Moreover, the difference between the two conditions was statistically significant at the one-tailed level, $t(18) = 1.96$, $p < .05$.

The expected asymmetrical pattern of preferences was observed and is consistent with the spontaneous preference for attractive over unattractive tiger faces that was demonstrated in Experiment 3. Specifically, a spontaneous preference for attractive tiger faces would have facilitated a novelty preference for an attractive tiger face after familiarization with an unattractive tiger face, and interfered with a novelty preference for an unattractive tiger face after familiarization with an attractive tiger face.

General discussion

To our knowledge, all previous demonstrations of the preference that infants display for attractive over unattractive faces have involved conspecific (i.e. human) faces. This aspect of the infant face perception literature has left open the question of whether the attractiveness preference is a consequence of an adaptation to mate choice or reflects the operation of general perceptual-cognitive mechanisms (Basolo, 1990; Cornwell *et al.*, 2004; Ghirlanda *et al.*, 2002; Halberstadt & Rhodes, 2000; Rhodes, 2006; Symons, 1979; Thornhill & Gangestad, 1999). In the present series of experiments, we attempted to address this issue by examining how infants respond to nonhuman animal faces.

The results of Experiment 1 demonstrated that the preference for attractive faces by infants that has previously been observed for human faces can also be observed for domestic cat faces. The preference for attractive cat faces was not observed when the faces were inverted in Experiment 2, which is analogous to what happens to the preference for human faces with the same manipulation (Slater, Quinn *et al.*, 2000; Van Duuren *et al.*, 2003). This outcome suggests that the attractiveness preference for cat faces may be governed by the same mechanisms that govern the attractiveness preference for human faces, and that it is not based on low-level image differences.

The findings of Experiments 1 and 2 point away from the mate-choice explanation of the attractiveness effect in infants. However, it could be argued that the preference by infants for attractive domestic cat faces might have occurred because humans bred domestic cats to fit their concept of human face attractiveness. Experiments 3 and 4 were therefore undertaken to determine how infants would respond to attractive versus unattractive faces from a wild species - tigers. Experiment 3 demonstrated that infants preferred upright, but not inverted, attractive over unattractive tiger faces, and Experiment 4 showed that the spontaneous preference for upright tiger faces impacts infant looking performance on a recognition memory task involving an attractive versus unattractive tiger face pairing.

One may ask what the present results imply regarding whether the attractiveness preference in infants is dependent on perceptual learning mechanisms or whether it reflects a face representation that newborn infants bring to the learning situation for faces. The learning account of the attractiveness effect is couched in terms of prototype formation: when several faces are averaged, adults perceive the resulting face as more attractive than any of the individual faces (Langlois & Roggman, 1990). By this learning account, infant preference for attractive faces may reflect a preference for faces similar to a composite of the faces seen since birth. In contrast, by a nativist account, newborn infants could enter the world with a face representation (Slater & Quinn, 2001), and attractive faces are preferred because they more closely match this representation. This representation could still be in the form of a prototype, except that it would have been formed through evolutionary mechanisms.

Our view is that when one considers (1) the findings from previous studies showing that newborn infants display an attractiveness preference for human faces (Slater, Bremner *et al.*, 2000; Slater, Quinn *et al.*, 2000), and (2) the results of the present study where young infants showed a preference for nonhuman animal faces that were not experienced prior to participation in the experiments, the overall pattern of outcomes is more consistent with the idea that infants come to the task of face learning with a face representation that is sufficiently general as to direct attractiveness preferences that are not human specific. This conclusion accords well with work examining the nature of the face representation that young infants use to recognize individual human and nonhuman (i.e. monkey) faces (Pascalis, de Haan & Nelson, 2002). However, whereas the ability to respond to attractive versus unattractive nonhuman animals persists into adulthood, the ability to differentiate among individual nonhuman animal faces decreases in older infants, a decline that continues into adulthood. More generally, whereas some aspects of our representation of faces may be modifiable by experience so that they become quite finely tuned on the basis of one's early learning history (see related work on the developmental processing of race; Bar-Haim, Ziv, Lamy & Hodes, 2006; Kelly, Quinn, Slater, Lee, Gibson, Smith, Ge & Pascalis, 2005; Kelly, Liu, Ge, Quinn, Slater, Lee, Liu & Pascalis, 2007), others like attractiveness may remain broadly receptive to a variety of inputs. This latter observation is not to deny that environmental learning can influence judgments of facial beauty given that ratings of attractiveness of human faces by older children and adults have been shown to be affected by both laboratory and everyday experience (Cooper, Geldart, Mondloch & Maurer, 2006; Rhodes, Jeffery, Watson, Clifford & Nakayama, 2003).

One may also ask whether the attractiveness preference demonstrated here could have arisen purely from experience provided with the nonhuman animal faces within the experimental task, a possibility that is supported by the speed with which even newborn infants have been reported to form prototypes (Walton & Bower, 1993). To examine this possibility, preferences for the upright attractive domestic cat faces were calculated for the first two trials and last two trials (instead of calculating a single preference over all four trials). An online prototype formation account of the attractiveness preference would suggest that a prototype would build up during the course of the trials with the consequence of a stronger preference for trials 3-4 versus trials 1-2. Alternatively, if the attractiveness preference results from a face representation that infants bring into the experiment, then one would expect the attractiveness preference to be manifested throughout the course of the trials with no difference between trials 1-2 versus trials 3-4. The analysis of preference by trials revealed a mean attractiveness preference of 60.55% (SD = 20.06) for trials 1-2 and 61.03% (SD = 18.48) for trials 3-4. Both means were reliably above chance, $t(19) > 2.35$, $p < .05$, in both cases, and the two means were not significantly different from each other, $t(19) = -0.08$, $p > .20$. The results of this analysis were replicated in an examination of the preferences for the upright attractive tiger faces by trials: $M = 58.12$ (SD = 15.48) for trials 1-2 and $M = 64.04$ (SD = 19.46) for trials 3-4, with each mean significantly above chance, $t(19) > 2.34$, $p < .05$, in both cases, and the two means not reliably different from each other, $t(19) = -1.08$, $p > .20$. The outcomes of these analyses are consistent with the idea that the attractiveness preference for cat and tiger faces results from a representation that 3- to 4-month-olds bring into the experiment.

An interesting question for further empirical work is to determine why the attractiveness dimension of the face representation is in some sense underspecified by experience, at least during early development. That is, if the input to a 3- to 4-month-old consists primarily of adult faces of a particular race (same-race), is biased toward the female gender (Quinn, Yahr, Kuhn, Slater & Pascalis, 2002; Ramsey-Rennels & Langlois, 2006), and includes no experience with nonhuman animals, then how is it that infants are able to respond to attractiveness in infant faces, other-race faces, male faces, and cat/tiger faces? The present findings actually suggest that neither an innate mate choice bias nor a general learning mechanism that is driven by experience can account for face attractiveness preferences in infants. Rather, the initial settings of our perceptual system push infants to look at some entities (attractive faces) more than others (unattractive faces) because of a family of preferred perceptual features that includes but may not be limited to particular features such as large eyes (Geldart, Maurer & Carney, 1999) and the complex geometric attributes that characterize the spatial relations among the features such as their location (e.g. height) and arrangement (e.g. symmetry, top-heaviness) within the whole (Cassia, Turati & Simion, 2004; Eisenthal, Dror & Ruppin, 2006; Geldart, Maurer & Henderson, 1999; Perrett, Burt, Penton-Voak, Lee, Rowland & Edwards, 1999; Rhodes, Proffitt, Grady & Sumich, 1998; but see Rhodes, Geddes, Jeffery, Dziurawiec & Clark, 2002). Moreover, the fact that the geometric attributes may be encoded from non-face objects raises the interesting possibility that aesthetically based preferences in infants might even extend beyond faces to non-face objects that are judged by adults to be attractive (Halberstadt & Rhodes, 2000).

In conclusion, the finding that infants will display an attractiveness preference for nonhuman animals suggests that the attractiveness preference that infants display for human faces reflects the activity of general processing mechanisms that are innately prespecified but subject to modifications due to experience. The findings imply further that the search for whatever mechanisms guide infant and adult visual systems toward attractive faces needs to consider the attributes that can be encoded from both human and nonhuman animal faces.

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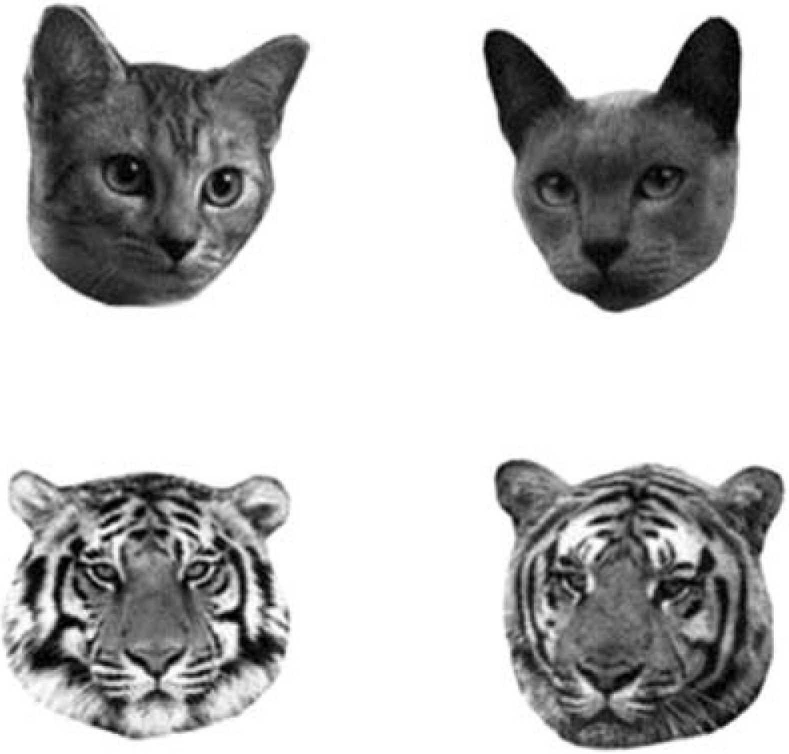

Figure 1.
Grayscale examples of the cat (top panel) and tiger (bottom panel) face stimuli used in the experiments. Attractive faces are on the left, unattractive faces are on the right.