

# Facial Diversity and Infant Preferences for Attractive Faces

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Three studies examined infant preferences for attractive faces in four types of faces: White adult male and female faces, Black adult female faces, and infant faces. Infants viewed pairs of faces, previously rated for attractiveness by adults, in a visual preference paradigm. Significant preferences were found for attractive faces across all facial types. The results confirm earlier reports of this phenomenon and extend those results by showing that infant preferences for attractive faces generalize across faces differing in race, gender, and age. Two potential explanations for these observed infant preferences are discussed.

We recently reported several studies showing that young infants visually discriminate among adult female faces based on the adult-judged attractiveness of the faces and that infants exhibit both visual and behavioral preferences for attractive compared with unattractive female faces (Langlois et al., 1987; Langlois, Roggman, & Rieser-Danner, 1990). These results were surprising to many people because infants were not expected to be able to make such subtle discriminations. In addition, most researchers interested in the effects of physical attractiveness have assumed that preferences for attractiveness are only gradually learned through a lengthy period of cultural transmission and through exposure to the standards of attractiveness extant in the contemporary media and society. However, these behaviors of young infants suggested that preferences for attractiveness in faces are present much earlier than has been assumed.

Other researchers have also found that infants look longer at and seem to prefer attractive compared with unattractive female faces. Samuels and Ewy (1985) and Shapiro, Hazan, and Haith (1984) showed both adult male and adult female faces that were rated as high or low in attractiveness by adult judges to infants ranging from 3 to 6 months of age. The infants in these studies looked significantly longer at both the male and the female attractive faces compared with unattractive faces. Although some methodological limitations of these two studies prevent a clear-cut interpretation of their results, they at least suggest that infants can discriminate attractiveness in two different types of faces, male and female.

Given the challenge that these findings from infants pose to the widely accepted assumptions about the origins of preferences for attractiveness (Langlois et al., 1987), it is important to investigate the generality of these preferences across different

types of faces. Demonstrating infant preferences for attractive faces across different types of faces would extend the phenomenon to the class of faces in general and would serve as an important replication of the work with female faces.

The purpose of the present studies was therefore to replicate our previous results with adult female faces and to determine if infant preferences for attractive faces extend beyond adult female faces to other types of faces. Specifically, we used a visual preference paradigm to investigate infant preferences for attractiveness in male and female adult White faces, in Black adult female faces, and in the faces of other young infants.

## Study 1

Our purposes in conducting this study were, first, to replicate our previous results with adult female facial stimuli (Langlois et al., 1987), second, to extend the results to male facial stimuli, and, third, to investigate whether the manner in which male and female faces are presented influences infant preferences. Shapiro et al. (1984), for example, noted that infant interest in male faces was significantly reduced when these faces were presented separately compared with when they were alternated with female faces. Because Samuels and Ewy (1985) also presented male faces alternating with female faces, it is not clear whether infants preferred attractive male faces themselves or whether the female faces somehow "primed" the preferences of the infants in these two studies. Therefore, in addition to presenting both male and female faces, we included two methods of presentation. In one condition, infants viewed separate sets of attractive and unattractive male and female faces; in the other condition, infants viewed alternating pairs of attractive and unattractive male and female faces, similar to the procedures of Samuels and Ewy (1985) and of Shapiro et al. (1984).

## Method

*Subjects.* One hundred ten 6-month-old infants were recruited from the subject pool at the Children's Research Lab at the University of Texas at Austin. Fifty infants were eliminated from the final sample for

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the following reasons: 41 for fussing,<sup>1</sup> 3 for computer or equipment failure, 3 for experimenter error, 2 because the mother looked at the slides, and 1 because the infant was 1 month premature. The 60 remaining infants (35 boys and 25 girls) were healthy, full-term infants from middle-class families, with an average age of 6 months, 6 days. Fifty-three infants were White, 5 were Hispanic, 1 was Black, and 1 was Asian. All of the infants were tested within 3 weeks of their 6-month birthday.

**Stimuli.** Each infant saw color slides of 16 adult women and 16 adult men; half of the slides of each sex depicted attractive faces, the other half unattractive faces. The slides of the women's faces had been used in a previous study of infant preferences for attractive faces (Langlois et al., 1987). The slides were selected from a pool of 275 women's and 165 men's faces that were rated for attractiveness by at least 40 undergraduate men and women using a 5-point Likert-type scale (range of mean attractiveness for women = 1.05 to 4.02,  $M = 2.26$ ,  $SD = 0.68$ ; range for men = 1.11 to 4.06,  $M = 2.42$ ,  $SD = 0.56$ ). The reliabilities of these ratings were .97 for the women's faces and .95 for the men's faces, as assessed by coefficient alphas.

Slides with high and low attractiveness ratings from the pools of male and female faces were identified as potential stimuli. The final stimuli were selected so that facial expression, hair length, and hair color were equally distributed across attractiveness conditions within sex of slides. All of the male faces were clean-shaven. Clothing cues were masked and all of the faces were posed with neutral expressions. The mean attractiveness ratings for the stimulus faces were 3.46 for the attractive women, 3.35 for the attractive men, 1.44 for the unattractive women, and 1.40 for the unattractive men. Both the attractive female and the attractive male stimuli were significantly more attractive than the mean of the larger pool of photographs for each group,  $t(274) = 4.99$ ,  $p < .001$ , for the women and  $t(164) = 4.70$ ,  $p < .001$ , for the men. Likewise, the unattractive women and men were significantly less attractive than the mean of each group,  $t(274) = -3.41$ ,  $p < .001$ , for the women and  $t(164) = -4.34$ ,  $p < .001$ , for the men. There were no significant differences between the attractive male and the attractive female faces or between the unattractive male and the unattractive female faces.

**Procedure.** A standard visual preference technique was used in which two faces, one attractive and one unattractive, were simultaneously rear-projected onto a screen. The infant was seated on the parent's lap approximately 35 cm from the screen. The parent wore occluded glasses to prevent him or her from viewing the faces so that parental preferences could not be communicated to the infant. A light and a buzzing noise were used to capture the infant's attention at the center of the screen before the beginning of each trial. When the infant looked at the center of the screen, the next pair of slides was displayed. A trial began when the infant first looked at one of the slides; each trial lasted for 10 s. During intertrial intervals, filtered light was displayed to keep the level of brightness on the screen consistent throughout the procedure.

The stimuli were presented in two sets of 16 slides. Each set was divided into eight trial blocks of two slides each. To control for infant side biases, each trial block consisted of two consecutive 10-s trials in which a slide pair was presented in a right-left position for the first trial and the reversed left-right position for the second trial. Slides were always paired within sex so that infants viewed only pairs of women or pairs of men. In one condition of presentation (alternating), the infants observed alternating pairs of males and females. In the other condition (grouped), infants saw all the women's slides together and all the men's slides together. The infants were given a 5-10-min break after eight trial blocks to alleviate fatigue. Order of set presentation, order of slide-pair presentation within sets (within the constraints of the set), and order of slide pairing were randomized across subjects so that a particular slide of an attractive face could be paired with any slide of an unat-

tractive face of the same sex for any given subject. Trial length, slide advance, and recording of the data were controlled by a laboratory computer.

The experimenter observed the infants' visual fixations on a video monitor connected to a video camera mounted just under the projection screen. Direction and duration of looks were recorded on the keyboard of a laboratory computer that functioned as an event recorder. Using the televised image of the infant to observe visual fixation ensured that the experimenter could not see the displayed slides and was therefore blind to the attractiveness level of the slides the infant was observing. Reliability of the visual-fixation scoring was obtained by having each experimenter score randomly selected videotaped sessions periodically throughout data collection. An intraclass correlation, which allows generalization to other populations of experimenters and infants, was used to assess reliability. The resulting intraclass correlations for the average of the reliabilities of the individual experimenters ranged from .97 to .99.

Because some infants were excluded from the analysis for fussing, it was important to establish agreement among experimenters on infant fussing. Using videotaped sessions, the agreement among experimenters' judgments of fussing on each trial in a session was evaluated using coefficient kappa, a conservative estimate of agreement that takes the probability of chance into account. The kappas for fussing ranged from .60 to 1.0, with a mean kappa of .82.

To determine whether the infants' preferences for faces might be influenced by the attractiveness of the mothers, photographs were taken of the mothers.<sup>2</sup> These photographs were rated for attractiveness by 72 undergraduates (29 men, 43 women), who judged attractiveness using a 5-point Likert-type scale. The reliability of these ratings was .98 as assessed by coefficient alpha.

## Results

**Looking time.** Each infant's total looking time at each stimulus slide was obtained by summing looking time at the right- and the left-side presentations of the slides. Looking time was then subjected to a four-way repeated-measures multivariate analysis of variance (MANOVA), using the regression approach to control for the unequal numbers of male and female infants (Langlois et al., 1987; McCall & Appelbaum, 1973). Infant sex was the between-subjects factor; condition of presentation (slides of the same sex grouped together or alternating with the other sex), sex of face, attractiveness level (attractive or unattractive), and trial were within-subjects factors.

The results indicated that infants looked longer at the attractive faces than the unattractive faces,  $F(1, 58) = 4.73$ ,  $p = .03$  (see Table 1). This main effect for attractiveness did not interact with sex of face, indicating that infant preferences for attractive faces were evident for both adult male and adult female faces. Condition of presentation was not significant and did not interact with any other factors.

A Sex of Infant  $\times$  Sex of Stimulus Face interaction was also obtained,  $F(1, 58) = 4.34$ ,  $p = .04$ . Univariate analyses indicated

<sup>1</sup> The very large number of trials in this procedure ( $N = 32$ ) relative to the typical infant visual preference study contributed to the high rate of fussing and, thus, attrition. In addition, a relatively strict criterion of fussing was required: Infants who fussed on any trial during the procedure were not included in the data analysis because fussing interfered with their looking behavior.

<sup>2</sup> Eleven mothers were not photographed because of equipment failure or experimenter error.

Table 1  
Mean Fixation Times for High- and Low-Attractiveness Slides

Type of face	High attractiveness		Low attractiveness	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Male and female faces (Study 1)	7.82	1.35	7.57	1.27
Black female faces (Study 2)	7.05	1.83	6.52	1.92
Baby faces (Study 3)	7.16	1.97	6.62	1.83

that boys looked at male faces longer than at female faces,  $F(1, 34) = 7.66, p < .01$  (Table 2). The girls also looked longer at same-sex faces, although the difference was not significant. Finally, a main effect for trial was found,  $F(3, 56) = 24.46, p < .001$ . The univariate analyses of this trial effect revealed that infant looking time decreased over the session.

**Maternal attractiveness.** The relationship between maternal attractiveness and infant preferences for faces based on attractiveness and sex was also examined. A median split was performed on maternal attractiveness, and infants were divided into two groups depending on whether their mothers were in the upper or lower half of the range of maternal attractiveness (Langlois et al., 1987). A MANOVA was performed on infant looking time, with mother attractiveness and sex of infant as between-subjects factors and sex of stimulus face and attractiveness of stimulus face as within-subjects factors. No significant relationships were found between mother attractiveness and infant sex, sex of stimulus face, or attractiveness of stimulus face.

## Study 2

To extend the findings to non-White faces, a second study was conducted, in which infants were shown faces of Black adult women. The faces were rated for attractiveness by both Black and Caucasian adult judges.

### Method

**Subjects.** Forty-three 6-month-old infants selected from the Children's Research Lab subject pool were tested. Two infants were excluded from the analysis because of fussing, and 1 was excluded because of equipment failure. The remaining 40 infants (15 boys and 25 girls) were healthy, full-term infants with an average age of 6 months, 5 days. Thirty-six babies were White, 2 were Black, and 2 were Hispanic.

**Stimuli.** The infants were shown color slides of the faces of 16 adult Black women selected from a pool of 127 photographs that had been rated for attractiveness by 98 White and 41 Black undergraduate men and women using a 5-point Likert-type scale. The reliability of the ratings of this pool was .99 for the White raters and .97 for the Black raters as assessed by coefficient alpha. The correlation between the mean ratings from the White judges and those from the Black judges for each photo was quite substantial,  $r(127) = .93, p < .001$ . The mean attractiveness ratings for the pool of faces ranged from 1.16 to 3.92 for the White raters ( $M = 2.15, SD = 0.61$ ) and from 1.29 to 3.83 for the Black raters ( $M = 2.18, SD = 0.62$ ). Eight of the slides that had been

rated as attractive and eight rated as unattractive were selected as stimuli. Clothing cues were masked and all of the faces had neutral expressions. Amount of hair and skin color were equally distributed across attractiveness conditions. The mean attractiveness rating for the attractive women was 3.41 as assessed by the White raters and 3.42 as assessed by the Black raters. For both White and Black raters, these attractiveness ratings were significantly above the mean for the pool,  $t(126) = 5.84, p < .001$ , for White raters and  $t(126) = 5.66, p < .001$ , for Black raters. The mean attractiveness rating for the unattractive women was 1.44 as assessed by the White raters and 1.54 as assessed by the Black raters. Both White and Black raters evaluated these stimuli as significantly less attractive than the mean of the larger pool,  $t(126) = -3.29, p < .01$ , for White raters and  $t(126) = -2.92, p < .01$ , for Black raters.

**Procedure.** A visual preference technique similar to the one described in Study 1 was used to assess infants' preferences. However, we did not include a condition of presentation factor (grouped vs. alternating), and we reduced the number of trials required for each infant in order to lessen fatigue and attrition. Each infant saw four of the eight attractive slides paired with four of the eight unattractive slides presented in four trial blocks. As in Study 1, each slide pair was presented twice; the second presentation was in the reversed right-left position from the first presentation. The pairing of slides varied randomly, the only restriction being that slides had to be paired with slides of the other level of attractiveness. Across infants, all eight attractive and all eight unattractive faces were presented. The intraclass correlation calculated to assess reliability for looking time ranged from .95 to .97. Kappas assessing the agreement of fussing judgments ranged from .89 to 1.0, with a mean kappa of .93.

To determine whether the infants' preferences were influenced by the attractiveness of the mother, photographs were taken of the mothers. These photographs were rated for attractiveness by 49 undergraduates (27 men, 22 women), who judged attractiveness using a 5-point Likert-type scale. The reliability of these ratings was .97 as assessed by coefficient alpha.

## Results

**Looking time.** Each infant's total looking time at each slide was obtained by summing the right- and the left-side presentations of that slide. Looking time was then subjected to a two-way repeated-measures MANOVA using the regression approach, with infant sex as a between-subjects factor. The within-subjects factors were attractiveness of stimulus face (attractive or unattractive) and trial.

The analyses indicated that 6-month-old infants looked longer at the attractive Black women's faces than at the unattractive faces,  $F(1, 38) = 4.34, p < .05$  (see Table 1). In addition, a main effect for trial was found,  $F(3, 36) = 15.81, p < .001$ . The univariate analyses revealed that infants looked longer in the first two trials than in subsequent trials. There was no interaction between stimulus attractiveness and trial, and sex of infant

Table 2  
Mean Fixation Times for Sex of Infant  $\times$  Sex of Face Interaction

Sex of infant	Male face		Female face	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Male	7.95	1.45	7.36	1.31
Female	7.69	1.35	7.81	1.33

was not significant and did not interact with any of the within-subjects factors.

*Maternal attractiveness.* The relationship between maternal attractiveness and infant preferences for faces was examined using the same procedures as in Study 1. Like Study 1, no significant relationships were found between maternal attractiveness and either infant sex or attractiveness of stimulus face.

### Study 3

To extend the results obtained when infants look at adult faces, we conducted a third study using stimulus faces of babies varying in attractiveness.

#### Method

*Subjects.* Fifty-two 6-month-old infants selected from the same subject pool as in Studies 1 and 2 were tested. Eleven infants were excluded from the analysis because of fussing, and 2 infants were excluded because they were not tested within 3 weeks of their 6-month birthday. The 39 remaining infants (19 boys and 20 girls) were healthy, full-term infants from middle-class families, with an average age of 6 months, 15 days. Thirty-seven of the infants were Caucasian; 2 were Hispanic.

*Stimuli.* The infants were shown color slides of the faces of sixteen 3-month-old male and female infants selected from a pool of photographs of 60 boys and 62 girls that had been rated for attractiveness by at least 40 undergraduate men and women using a 5-point Likert-type scale. The reliability of the ratings of these larger pools was .97 for the male infants' faces and .96 for the female infants' faces as assessed by coefficient alpha. Attractiveness ratings, averaged across raters, ranged from 1.22 to 4.21 for the male infants and 1.37 to 3.98 for the female infants. Four male and 4 female slides that had been rated as attractive and 4 male and 4 female slides rated as unattractive were selected as stimuli. Clothing cues were masked and all faces had neutral expressions. Amount of hair was equally distributed across attractiveness conditions. The mean attractiveness ratings were 3.02 for the attractive babies and 1.69 for the unattractive babies. When compared with the mean rating (2.44) of the larger pool from which they came, the attractive set was significantly more attractive,  $t(121) = 2.56, p < .05$ , and the unattractive set was significantly less attractive,  $t(121) = -3.31, p < .01$ .

*Procedure.* A visual preference technique identical to the one used in Study 2 was used. The intraclass correlation calculated to assess reliability for looking time ranged from .95 to .97. Kappas assessing reliability for fussing ranged from .85 to 1.00, with a mean kappa of .92. Because we did not find any significant effects of the attractiveness of the mother on infant preferences in Studies 1 and 2 and because it seemed unlikely that the attractiveness of the mother would influence preferences for baby faces, maternal attractiveness was not evaluated in this study.

#### Results

As in the previous two studies, each infant's total looking time was obtained by summing the right- and the left-side presentations of the slides. Looking time was then subjected to a two-way repeated-measures MANOVA, with infant sex as a between-subjects factor. The within-subjects factors were attractiveness of stimulus face and trial.

The analyses indicated that 6-month-old infants looked longer at the attractive babies' faces than at the unattractive faces,  $F(1, 37) = 4.85, p = .034$ . In addition, a main effect for trial was found,  $F(3, 35) = 7.53, p < .001$ . The univariate analyses revealed that infants looked longer in the first two trials than in subsequent trials. There was no interaction between stimulus attractiveness and trial, and sex of infant was not significant and did not interact with any of the within-subjects factors.<sup>3</sup>

### General Discussion

The results of these three studies unambiguously show that 6-month-old infants can discriminate attractive from unattractive faces and that they visually prefer attractive faces of diverse types. These results represent more than just replications of previous findings of infant preferences for the faces of attractive women. Rather, these results are important because they show that infants treat attractive faces as distinctive regardless of the sex, age, and race of the stimulus faces, even though most of the infants had little experience with some of the types of faces they viewed (e.g., the faces of Black women and of 3-month-old infants) and even though the infants had little experience with cultural transmission of standards of beauty. The ability of young infants to discriminate attractiveness in such diverse faces is all the more remarkable given the rather substantial differences in the structure of male and female, Black and White, and adult and infant faces (e.g., Farkas, 1981). Thus, the facial cues that yield judgments of attractiveness seem to be invariant across different types of faces, and even young infants seem to be able to perceive them. Other research has shown that there are important behavioral concomitants of these laboratory-derived visual preferences, at least in slightly older infants: Twelve-month-olds interact differently with attractive and unattractive faces and show more positive affect, less withdrawal, and more play involvement with an attractive compared with an unattractive unfamiliar adult (Langlois et al., 1990).

Why are attractive faces special to infants and why do infants prefer them to less attractive faces? And why is it that, contrary to common assumption, recent cross-cultural investigations have demonstrated surprisingly high (e.g., .66–.93) interrater reliabilities in judgments of attractiveness (Bernstein, Lin, & McClellan, 1982; Cunningham, 1986; Johnson, Dannenbring, Anderson, & Villa, 1983; Maret, 1983; Maret & Harling, 1985; McArthur & Berry, 1987; Richardson, Goodman, Hastorf, & Dornbusch, 1961; Thakerar & Iwawaki, 1979; Weisfeld, Weisfeld, & Callaghan, 1984)? For example, Cunningham (1986) assembled an international sample of photographs of female faces, had the faces rated for attractiveness, and measured various features of the faces. As in other cross-cultural studies, and like our own samples of Black and White judges, raters agreed about the attractiveness of this international sample of faces. Furthermore, the facial measurements showed that although Black, White, and Oriental faces possessed ethnically distinct features, there was considerable similarity in facial features associated with attractiveness across racial groups. Thus, ethnically diverse faces possess both distinct and similar, perhaps even universal, structural features. These features seem to be perceived as attractive regardless of the age and the racial and cultural background of the perceiver.

Perhaps, then, attractive faces are preferred by infants and

<sup>3</sup> Although same-sex preferences were obtained in Study 1 with adult faces, we considered it unlikely that such preferences would be observed with the faces of 3-month-old infants as stimuli. Indeed, when asked to guess the sex of the stimulus infants, 10 adults performed at chance levels. The results of an analysis that included sex of stimulus infant as a factor confirmed our suspicion: Neither sex of stimulus nor the Sex of Stimulus Infant  $\times$  Sex of Subject interaction were significant,  $F_s(1, 37) = 1.66$  and  $0.17$ , respectively, both *n.s.*

adults from different cultures because they are more prototypic of the category of faces. One definition of a prototype includes exemplars of a category that represent the averaged members of the class of objects comprising the category (e.g., Reed, 1972; Rosch, 1978; Strauss, 1979). We recently reported data showing that prototypical, or "average," faces, created by digitizing and then mathematically averaging a series of individual faces, were rated as highly attractive (Langlois & Roggman, 1990). The averaged faces were not at all average in facial attractiveness, but, in fact, were rated as significantly more attractive than digitized images of the individual faces that were averaged together. Furthermore, averaged faces became even more attractive as more faces were added. This phenomenon held true for several samples of both male and female faces and for several samples of raters.

Given that "averageness" seems to be an important ingredient of facial attractiveness, two explanations seem viable for our findings showing that even young infants prefer attractive faces. Evidence already exists demonstrating that the average value of the members of a class of objects can be prototypical, that infants are capable of forming prototypes by averaging features, and that infants assign prototypes special status even when they have not seen them before (e.g., Bomba & Siqueland, 1983; Cohen & Younger, 1983; Posner & Keele, 1968; Strauss, 1979). Strauss (1979), for example, showed schematic faces to infants and demonstrated that young infants recognized facial prototypes made from the averaged values of previously viewed facial features and that they responded to these prototypical or averaged schematics as distinctive, even though they had never seen them before. In contrast, infants did not treat schematics made from the most frequently seen features as special. Although our data did not demonstrate that attractive faces are perceived as prototypes by infants, they did show that infants have remarkable capabilities to respond differentially to attractive versus unattractive faces with greater visual attention. The perception by adults of prototypes or averaged faces as attractive supports an interpretation of infant preferences for attractive faces as part of a categorical social response to prototypic members of the category of faces.

Another explanation for the preferences of infants for attractive faces, although also resting on the notion that an attractive face is an averaged member of the category of faces, depends on a very different literature and theoretical rationale than that of cognitive abstraction of facial stimuli. Evolutionary biologists would account for infant preferences for attractive faces as an innate tendency to prefer average values of the population of faces. In normalizing or stabilizing selection, evolutionary pressures operate in favor of the average of the population and against the extremes of the population (e.g., Bumpas, 1899; Dobzhansky, 1970; Schmalhausen, 1949; Symons, 1979). Thus, the average values of many anatomical features should be preferred in the population because individuals close to the mean for the population are less likely to carry harmful genetic mutations. Symons (1979) specifically proposed an innate mechanism of perception that detects the population mean of anatomical facial features by averaging observed faces. Because of stabilizing selection pressures, these "average" faces are preferred by the species over faces more distant from the mean, according to Symons.

Although the data currently available do not allow us to

choose between the cognitive and the evolutionary explanations, both perspectives bring coherence and reason to data showing preferences for attractive faces during infancy, long before any significant cultural input is possible, and to the cross-cultural data showing more similarities than differences in cross-cultural preferences for attractive faces. Although studies demonstrating an innate preference for attractive faces would be difficult to conduct because of the limitations of the visual system of the newborn (e.g., Banks & Salapatek, 1983), studies showing that infants perceive attractive faces as prototypical are, in principle, possible and are now called for to further explicate infants' preferences for attractive faces.

As we have noted in other reports, the preferences of the infants who participated in these three studies, although quite reliable and consistent across studies, were not strong. Infants do not refuse to look at unattractive faces in exclusive preference to attractive faces. Furthermore, differences in looking time toward attractive and unattractive faces may be obtained only for unfamiliar faces; it seems unlikely that attractiveness would influence infant behavior toward familiar caregivers given the importance of the attachment system to the survival of the infant. At the same time, however, differential responsiveness toward unfamiliar attractive and unattractive faces would perhaps be even greater than that obtained here if faces more extreme in appearance were used as stimuli. We also note that the faces viewed by the infants in these three studies were always presented in contrasting pairs. Thus, we cannot assume from these data that infants prefer attractive faces in the absence of a contrasting face, although 6-month-old infants in our earlier study (Langlois et al., 1987) did exhibit preferences for attractive faces both when the attractive faces were presented with contrasting unattractive faces and when they were not.

Several factors that may have limited or moderated in some way the preferences of the infants were examined. However, these variables did not interact with or influence infants' preferences for attractiveness. The attractiveness of the mother was not related, in either Study 1 or Study 2, to the infants' preferences for attractive male or female, Black or White faces. Nor was maternal attractiveness related to infant preferences for attractive faces in our earlier study (Langlois et al., 1987). The method of presenting faces to infants, either in groups or alternating male and female faces, did not interact with or influence infants' preferences for attractive male or female faces. Thus, infant preferences for attractive faces seem robust and are not merely a function of the appearance of the infant's own mother or of the method used to present the faces in a visual preference paradigm.

An interesting serendipitous finding obtained from Study 1 concerns the Sex of Infant  $\times$  Sex of Face interaction. Both male and female infants preferred to look at same-sex adult faces (although the pattern for girls was not statistically significant) compared with faces of the other sex. Although previous work has suggested that young infants are capable of discriminating gender in faces (Fagan & Singer, 1979; Kagan & Lewis, 1965; Leinbach & Fagot, 1986), no work of which we are aware has examined the visual preferences of infants as young as these for the faces of one gender over the other. Other work has shown, however, that older infants (12 to 18 months old) display similar same-sex preferences when presented with photographs of male and female same-age infants (Lewis & Brooks-Gunn,

1979). The fact that our 6-month-old infants did not display same-sex preferences toward photographs of male and female 3-month-olds is not surprising given that even adults could not discriminate the sex of these very young infants (see footnote 3). Perhaps same-sex preferences would be observed in 6-month-olds if they were allowed to view photographs of older infants. It is intriguing to speculate that the preferences of young infants for same-sex adult faces may be the rudiments of the strong and possibly even universal same-sex preferences found in older children (Edwards & Whiting, 1988; Maccoby, 1988). Research specifically designed to systematically investigate the gender preferences of young infants merits attention in the future.

The results of these three studies and those of other studies with infants (Langlois et al., 1987, 1990; Samuels & Ewy, 1985; Shapiro et al., 1984) are convincing in demonstrating that preferences for attractiveness appear very early in life, are consistent across various types of faces, and generalize beyond visual behaviors to social and play behaviors. Exposure to cultural media does not seem to account for these preferences; rather, preferences for attractiveness are either innate or acquired with only minimal experience with faces in the environment. The basis for preferences for attractive faces may be that attractive faces are prototypical of the category of faces. Contrary to the common stereotype that "beauty is merely in the eye of the beholder," it may well be that the majority of perceivers at any age and from any culture can detect and prefer a particular type of face (e.g., one that is "average" for that population) as attractive.

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