Infant Preferences for Attractive Faces: Rudiments of a Stereotype?

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Two studies, one with 2- to 3-month-olds and one with 6- to 8-month-olds, were conducted to examine infant preferences for attractive faces. A standard visual preference technique was used in which infants were shown pairs of color slides of the faces of adult women previously rated by other adults for attractiveness. The results showed that both the older and younger infants looked longer at attractive faces when the faces were presented in contrasting pairs of attractiveness (attractive/unattractive). When the faces were presented in pairs of similar levels of attractiveness (attractive/attractive vs. unattractive/unattractive) the older but not the younger infants looked longer at attractive faces. The results challenge the commonly held assumption that standards of attractiveness are learned through gradual exposure to the current cultural standard of beauty and are merely "in the eye of the beholder."

The data on stereotypes and behavioral expectations associated with facial attractiveness provide one of the most consistent, pervasive, and robust findings in social and social-developmental psychology. Both adults and children prefer attractive over unattractive individuals: They attribute positive qualities and abilities to attractive individuals and negative qualities and abilities to unattractive individuals, and they behave differently toward attractive and unattractive persons (see Berscheid & Walster, 1974; Langlois, 1986; or Langlois & Stephan, 1981, for reviews). Furthermore, adults and children use similar standards in evaluating the attractiveness of others (Langlois, 1986; Langlois & Stephan, 1977; Maruyama & Miller, 1981; Sorell & Nowak, 1981). Even different racial groups show substantial agreement in their attractiveness judgments (e.g., Cunningham, 1986; Kleck, Richardson, & Ronald, 1974; Stephan & Langlois, 1984). The preference for attractive persons, therefore, extends beyond single racial or age groups.

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The lack of empirical work on the origins of attractiveness-based preferences seems largely the result of two factors. First, many researchers have assumed that the standards, preferences, and stereotypes associated with attractiveness were learned gradually by children during years of exposure to the media and socialization agents. Second, it has been assumed that those standards of attractiveness vary from one historical period to another, from one cohort of individuals to another, and from one culture to another. Thus, since the inception of research on the social psychological implications of facial appearance, the standards of attractiveness and the preferences shown for attractive over unattractive persons were thought to originate from the cultural transmission of contemporary standards, definitions, and stereotypes. The attractiveness preference was therefore assumed to require extensive cultural input in the early years of life, not becoming evident until between ages 3 and 5 (Berscheid & Walster, 1974; Dion, 1973; Dion & Berscheid, 1974; Langlois, 1986; Langlois & Stephan, 1981).

A separate body of literature from that on attractiveness, however, suggests a different origin of preferences based on facial attractiveness and suggests that even young infants might be able to discriminate and prefer some faces over others. The infant perception literature provides data to show that young infants perceive, discriminate, and prefer some visual stimuli over others. For example, infants look longer at stimuli that are more complex (Brennan, Ames, & Moore, 1966) and that have high-contrast contours, curves, and concentricity (Fantz, Fagan, & Miranda, 1975; McCall & Melson, 1970). Infants are...
also particularly sensitive to vertical but not horizontal symmetry (Fisher, Ferdinandsen, & Bornstein, 1981). Perhaps because of these preferences, or perhaps in addition to them, some studies have found evidence of a preference in infancy for regular facial stimuli over scrambled faces (Goren, Sarty, & Wu, 1975) and for photographs of real faces over schematic drawings of faces (Lewis, 1969). In addition, as early as 3 months of age, infants can discriminate one unfamiliar face from another (Barrera & Maurer, 1981). By 6 months of age, infants can discriminate some facial expressions (Caron, Caron, & Meyers, 1982, 1985) and show a preference for joyful over angry expressions (LaBarbera, Izard, Vietze, & Parisi, 1976; Schwartz, Izard, & Anspul, 1985). At 6 months, infants can also distinguish faces on the basis of age and sex even when physical features are very similar (Fagan & Singer, 1979). During the first year of life, then, infants become capable of making sophisticated perceptual judgments about faces (Maurer, 1985) and, therefore, may even be sensitive to distinctions based on physical attractiveness.

The purpose of the studies we report here is to examine whether young infants can discriminate attractive and unattractive faces and whether they prefer attractive over unattractive faces. Evidence of the ability to discriminate one face from another is provided when infants exhibit differential looking times to simultaneously displayed faces. Evidence for a preference is provided when infants consistently look longer at one category of faces (e.g., attractive) over another category (see Banks & Salapatek, 1983; Fantz, 1965; Fantz & Fagan, 1975, for discussions). Differential looking at attractive and unattractive faces has similarly been used in the attractiveness literature as a measure of preference: Adults and children look longer at faces judged as attractive than at faces judged as less attractive (Dion, 1977; Hildebrandt & Cannan, 1985; Hildebrandt & Fitzgerald, 1978, 1981; Kleck & Rubenstein, 1975; Langlois & Casey, 1984; Power, Hildebrandt, & Fitzgerald, 1982).

If infants do not prefer or distinguish between attractive and unattractive faces, such discriminations and preferences would likely be acquired sometime between the period of infancy and ages 3 to 4. On the other hand, if young infants do discriminate and prefer faces on the basis of appearance, such findings would challenge the view that attractiveness-based standards and preferences are learned over time through gradual exposure to current standards and stereotypes associated with appearance. Such findings would suggest instead that appearance-based discriminations and preferences may be innate or acquired at a much earlier age than previously thought.

**Study 1**

**Method**

**Subjects.** Infants who were 6 to 8 months old were selected for the initial study because the results of previous research suggest that even though younger infants look at the internal features of faces, they may not become sensitive to the arrangement of features and perceive the face as a gestalt until around 6 months of age (Caron, Caron, Caldwell, & Weiss, 1973; Maurer & Salapatek, 1976). Forty-one infants were recruited from the infant subject pool maintained by the Children's Research Laboratory at the University of Texas. Seven infants were eliminated from the final sample because of fussiness or equipment failure during the procedure. The mean age of the 34 remaining infants was 6 months, 20 days (the range was between 23 and 34 weeks). Eleven of the infants were girls and 23 were boys; 32 infants were Caucasian and 2 were Hispanic. All were full-term, healthy infants from middle-class families.

**Stimuli.** The infants were shown color slides of the faces of 16 adult Caucasian women, 8 rated as attractive and 8 rated as unattractive. These 16 slides were selected from a larger pool of photographs that had been rated by groups of 40 or more undergraduate men and women who judged attractiveness using a 1-5 Likert-type scale. The distribution of the attractiveness ratings of the pool was approximately normal; most ratings fell within one standard deviation of the mean (and median) of 2.5. The reliability of these ratings was 0.97 or greater as assessed by coefficient alpha. Slides with the highest and lowest ratings were identified as potential stimuli. The slides selected from this group for the study consisted of the faces, posed with a neutral expression, of women with medium to dark hair, not wearing glasses. Hair color and length (long vs. short) were distributed equally across attractiveness conditions. Clothing cues were masked so that only the facial characteristics of the women were salient. The mean rating for the 8 attractive slides was 3.46 (the range was between 3.0 and 3.9); the mean for the 8 unattractive slides was 1.44 (the range was between 1.1 and 2.0).

**Procedure.** A standard visual preference technique was used in which two faces were simultaneously rear-projected side by side onto a single large screen so that each projected image was approximately the size of a real face. Angular size of the facial images averaged 28°. The infant was seated on the mother's lap about 35 cm from the screen. The mother's view of the slides was occluded so that her preferences could not be subtly communicated to the infant. During intervals between trials, a field of filtered light was projected so that the infant would remain adapted to the brightness of the slides. The infant's attention was directed to the center of the field of light by an experimenter who shook a rattle behind the center of the screen. The length of each intertrial interval was determined by the infant; a new trial began when the infant looked at the center of the screen.

Each infant participated in two conditions that were randomly distributed across trials. In one condition of the study, slides of the attractive women were randomly paired with slides of the unattractive women. This condition produced a within-trial comparison of looking times for attractive versus unattractive faces. Although data from this procedure would indicate whether infants looked longer at the more attractive slide within a pair they would not permit the inference that infants similarly would look longer at attractive faces in the absence of a concurrent alternative differing in attractiveness. It is possible that infants would look at attractive and unattractive faces for equivalent periods of time unless a choice of marked contrast were present. Therefore, we included another condition in which two slides of similar levels of attractiveness (either attractive/attractive or unattractive/unattractive) were randomly paired. This condition produced an across-trials comparison of looking times for attractive versus unattractive faces. Because infants are not typically presented with paired comparisons of faces differing substantially in level of attractiveness, this condition may be the more ecologically valid one (Cash & Derlega, 1978; Murstein, 1972).

The pairs of stimuli were presented in eight trial blocks: four for the attractive/unattractive pairings and four (two pairs of attractive faces and two pairs of unattractive faces) for the pairs similar in attractiveness. Each trial block contained two 10-s presentations, with each trial beginning with the infant's first look to one of the presented stimuli. The second presentation within each block consisted of the same two slides with the left-right positions reversed in order to control for infant side biases. The original- and reversed-position trials were presented consecutively.

1 The typical rate of subject loss for published infant research in which a visual preference paradigm is employed is 26%, ranging from 6% to 62% (Wachs & Smitherman, 1985).
71% of the infants (binomial $p = .008$) showing this effect. The results showed that infants 31) = 1.54, $p = .22$. There were no significant effects for trials or for the Trial $\times$ Attractiveness interaction. Sixty-two percent of the infants (binomial $p = .05$) preferred attractive faces.

Maternal attractiveness and sex of the infant. In both conditions, we examined the relation between the attractiveness of the infants' mothers and the infants' mean looking times for slides of high and low attractiveness. Infants were divided into two groups: those with mothers above and those with mothers below the median of the maternal sample in rated attractiveness. Analyses of variance (ANOVA), with slide attractiveness as

### Results

Analyses of both conditions of the study showed that 6- to 8-month-old infants looked at attractive faces longer than at unattractive faces.

**Within-trial comparison.** The analysis demonstrating these results examined infant looking time during the four trial blocks in which slides of contrasting levels of attractiveness were presented. The looking times for right- and left-side presentations of each slide were summed to obtain total looking times for each slide within a block and were subjected to a two-way repeated measures, multivariate analysis of variance (MANOVA). The MANOVA approach to repeated measures tests a set of orthogonal polynomials for the repeated factor, obviating any assumption of homogeneity of covariance. The within-subjects variables were the physical attractiveness of the stimulus slides and the trials in which the slides were presented. Mean looking times are shown in Table 1. The results showed that infants looked longer at attractive faces, $F(1, 33) = 5.66, p = .02$, with 71% of the infants (binomial $p = .008$) showing this effect. The MANOVA revealed no significant effect for trials, $F(3, 31) = 1.96, p = .14$, and no interaction between the physical attractiveness of the stimuli and trials, $F(3, 31) = 1.54, p = .22$. There were no significant effects for trials or for the Trial $\times$ Attractiveness interaction. Sixty-two percent of the infants (binomial $p = .05$) preferred attractive faces.

### Table 1

**Mean Fixation Times for High- and Low-Attractiveness Slides**

<table>
<thead>
<tr>
<th>Level of attractiveness</th>
<th>Experiment 1 (6- to 8-month-olds)</th>
<th>Experiment 2 (2- to 3-month-olds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>High</td>
<td>7.24</td>
<td>1.61</td>
</tr>
<tr>
<td>Low</td>
<td>6.59</td>
<td>1.74</td>
</tr>
<tr>
<td>Across-Trials comparison</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>High</td>
<td>7.33</td>
<td>1.47</td>
</tr>
<tr>
<td>Low</td>
<td>6.62</td>
<td>1.64</td>
</tr>
</tbody>
</table>

*In the Within-Trials comparison attractive slides were paired with unattractive slides for four trials, randomly distributed across all eight trials. In the Across-Trials comparison attractive slides were paired for two trials and unattractive slides were paired for two trials, randomly distributed across all eight trials.
attraction of the infants’ mothers and looking time in either subjects factor, indicated that there was no relation between the attractiveness of the infants’ mothers and looking time in either condition.

Finally, although no sex differences were predicted, a between-subjects MANOVA was performed to examine the possibility that the sex of the infant was related to preferences for attractiveness. No significant effects for sex of the infant were found in either condition.

**Study 2**

In order to replicate and extend the results obtained from 6- to 8-month-old infants, we repeated the study with younger infants. The same stimulus slides, experimenters, and procedures were used; however, infants were placed in an infant seat rather than on their mothers’ laps.

**Method**

Forty-one 2- to 3-month-old infants selected from the same subject pool were tested. Eleven were eliminated from the final sample. Seven of these infants were excluded for excessive fussiness and 3 for equipment failure (see footnote 1). One other infant was eliminated because of an excessive side preference (over 90% looking time to one side of the screen). The mean age of the remaining 30 infants was 2 months, 21 days (the range was between 10 and 14 weeks). Data from 16 girls and 14 boys (27 Caucasian, 2 Hispanic, 1 Asian) were analyzed.

**Results**

**Within-trial comparison.** As in the first study, the looking times for right- and left-side presentations of each slide were summed within each of the four trial blocks to obtain total looking times for each slide within each block. The data for the two conditions were analyzed in the same manner as that described for Study 1. Table 1 contains the mean looking times for slides of high and low attractiveness and shows that the infants looked longer at the attractive faces, $F(1, 29) = 4.15, p = .05$. This preference was shown by 63% of the infants (binomial $p = .05$). There were no significant effects for trials or for the interaction between the physical attractiveness of the stimuli and trials.

**Across-trial comparison.** The data from three additional subjects were lost due to temporary equipment failure that resulted in missing data for this condition. Thus, 27 subjects were included in the analysis, 14 boys and 13 girls. The mean fixation times for slides of high and low attractiveness for the across-trial comparison are reported in Table 1. The analysis revealed no significant differences in looking time as a function of the attractiveness of the stimuli, $F(1, 26) = 0.06, p = .81$. There was no trial effect and no interaction between trial and attractiveness.

**Maternal attractiveness and sex of the infant.** As in Study 1, no significant effects were found for either the attractiveness of the infant's mother or the sex of the infant.

**Discussion**

The results of these two studies indicate that both older and younger infants look longer at attractive than at unattractive faces when the stimuli are presented in contrasting pairs. This difference in looking time indicated that infants were capable of discriminating between the faces of female adults on the basis of adult-rated attractiveness and that they showed a visual preference for the attractive faces. This finding extends downward in age, previous results showing a similar effect in older children and adults (Dion, 1977; Hildebrandt & Cannan, 1985; Hildebrandt & Fitzgerald, 1978, 1981; Kleck & Rubenstein, 1975; Langlois & Casey, 1984; Power et al. 1982). Differential human responses to facial attractiveness, therefore, seem to begin early in the first year of life.

In the condition in which attractiveness levels were contrasted across trials only the older infants looked longer at the attractive faces. The failure of the younger infants to show a preference in this condition is probably best explained by differences in the developmental competence of the two age groups and by the methodology of the across-trial comparison condition. Older infants are more able or willing to look away from visual stimuli in this type of experimental situation. Younger infants, on the other hand, are less able to release their attention to visual stimuli and, given relatively short trial lengths, look at whatever visual stimuli are presented (Cohen, 1976). Thus, the younger infants probably reached ceiling in the second condition of the study, which prevented the possibility of obtaining differential looking time. The data are consistent with this interpretation, because in both conditions the younger infants looked at the stimuli for longer proportions of time than did the older infants. Younger infants, therefore, may find even an unattractive face interesting when no better alternative is available and when the trials are short in duration (Caron et al., 1982). A more sensitive test in this condition would be to use infant-controlled trial lengths or to lengthen the trials to avoid this ceiling effect for younger babies.

The preferences of the infants for attractive faces were not strong but they were quite consistent and were not atypical of the strength of preferences often found in the infant literature (e.g., Caron et al., 1973; Haaf, 1974; Sherrod, 1979). The magnitude of the observed preferences were, in part, due to the fact that the facial stimuli that we used were selected from a normal range of attractiveness and none were either extremely attractive or unattractive. More extreme facial stimuli may result in stronger preferences than those observed here. Even so, the magnitude of the preferences obtained here seems reasonable because it would not be adaptive for the infant to refuse to look at unattractive faces or to have extremely strong preferences for attractive faces.

The results of these studies may seem surprising to many, particularly given the firmly held assumptions that standards of attractiveness are culturally and historically variable and must be learned through gradual exposure to the current cultural standards. After we began our work, investigators in three other laboratories reported similar results demonstrating the infant’s ability to discriminate and prefer attractive faces (Reis, personal communication, April 1985; Samuels & Ewy, 1985; Shapiro, Hazen, & Haith, 1984). The design of each of these investigations, however, was methodologically limited or confounded (e.g., they did not use appropriate controls for side preferences or they confounded hair color and thus contrast with attractiveness condition, etc.) in ways that left the conclusions of any sin-
ingle study open to other interpretations. Nevertheless, the convergence of results across several samples of both infant subjects and facial stimuli offers support to our evidence of infant visual preferences for attractive female faces.

Why should infants prefer attractive faces? We can offer two arguments for debate and empirical investigation. The first suggests that preferences for attractive faces are an incidental consequence of the sensitivity of the human visual system to certain physical aspects of visual stimuli. The preference demonstrated here is specific to visual behavior, and it is already well known that human infants respond differentially to various stimuli in their visual environment (e.g., Banks & Salapatek, 1983; Gibson & Spelke, 1983; Haith, 1980). Infants are known, for example, to prefer high-contrast contours, curves, or concentricity in both facial and nonfacial stimuli (Fantz et al., 1975). Likewise, infants are more sensitive to vertical symmetry than to horizontal symmetry (Fisher et al., 1981), and to "good" figural form compared with "bad" figural form (Humphrey, Humphrey, Muir, & Dodwell, 1986; Strauss & Curtis, 1981). Attractive faces may be more curved and less angular or more vertically symmetrical than unattractive faces. The arrangement of facial features in attractive faces may also be more concentric than those in unattractive faces. These possible characteristics of attractive faces may contribute to infant preferences for them.

The second argument suggests that attractive faces may be more prototypic or "facelike" and have better defining features. If humans have evolved to respond to facial configurations for the purpose of extracting information relevant to social relations, adults and infants alike may respond most strongly to the most facelike stimuli in the environment. Thus, because attractive faces may be "better" faces (Galton, 1907) and because of the importance of the information conveyed by faces for social interaction, infants may have built-in or early developing preferences for those aspects of visual stimuli that are most similar to features of attractive or prototypic faces (Linn, Reznick, Kagan, & Hans, 1982; Sternglanz, Gray, & Murakami, 1977). This argument reverses the notion that preferences for attractive faces are an incidental consequence of preferences for certain forms of abstract visual information and suggests instead that preferences for symmetry, concentricity, curves, good form, and so forth, may be incidental to preferences for prototypic, attractive, or "better" faces.

It has been amply demonstrated that faces provide important information to perceivers about social interaction and social judgments. For example, faces with cranial and facial proportions that appear "babyish" elicit increased caregiving, protection, and assistance (Alley, 1980, 1981; Lorenz, 1943). Similarly, adults with babyish features are judged as likely to be more friendly and agreeable but less strong (McArthur & Aptow, 1983-1984). In contrast, children with faces that make them appear older are more likely to be abused. This suggests that adults, on the basis of the child's facial appearance, may form unrealistically high expectations for the behavior of these children—a situation that may in turn contribute to inappropriate treatment (McCabe, 1984). These age-related aspects of facial appearance offer important social information that is readily extracted and used to form expectations of and behavioral responses toward others.

Facial features and proportions, many of which are related to attractiveness (Maier, Holmes, Slaymaker, & Reich, 1984), specify information not only about the individual's age but also about his or her intellectual and behavioral competencies (Richardson, Koller, & Katz, 1985), health and reproductive attractiveness (Buss & Barnes, 1986; Cunningham, 1986; Symons, 1979), and propensities to interact in particular ways (e.g., Bradshaw, 1969; Dion, 1974; Hildebrandt & Fitzgerald, 1978; Langlois & Casey, 1984). Such information is necessary for efficient interpersonal interactions and functioning, and thus the ability to perceive such information would be adaptive and likely to be present, at least in rudimentary form, early in life. Indeed, early specialization by the nervous system for face perception is thought to be as important for the requirements of meaningful social relations as other specializations such as speech (Perrett, Rolls, & Caan, 1982; Yin, 1978). The early preferences for attractive faces observed here are undoubtedly related to the importance of sensitivity to faces in general.

The results of these studies demonstrate that infants have the perceptual abilities to make discriminations between attractive and unattractive faces—discriminations that are in the same direction as those made by adults. The results thus call for a radical reorientation of thinking about the origins of physical attractiveness preferences and stereotypes. Whether intrinsic to the nervous system of the infant or to the spatial characteristics of faces, the tendency to detect and prefer certain faces over others is present very early in life, long before any significant exposure to contemporary cultural standards, definitions, and stereotypes. Our results argue against the common assumption that physical attractiveness is arbitrarily defined, culturally dependent, and only gradually learned. Rather, these findings suggest that the rudimentary beginnings of preferences for attractiveness may be present in infancy and that a universal standard of attractiveness, overlaid with cultural and temporal variation, may exist. Indeed, the available cross-cultural evidence suggests that, although there is variability in judgments of attractiveness, far less variation is found both across and within cultures than would be expected from previous assumptions (Bernstein, Lin, & McClellan, 1982; Cunningham, 1986; Johnson, Dannenbring, Anderson, & Villa, 1983; Kleck et al., 1974; Langlois & Stephan, 1977; Maret, 1983; Richardson, Goodman, Hastorf, & Dornbusch, 1961; Stephan & Langlois, 1984; Weisfeld, Weisfeld, & Callaghan, 1984).

Our results lead to new lines of research because they raise many questions about preferences for facial attractiveness. For example, do infants have a general concept of an aesthetically pleasing face that generalizes across many different types of faces and cultures? To what stimulus dimensions of adult judgments of attractiveness do infants respond? Are attractive faces more prototypic of the human face? How are the visual preferences of infants related to those of adults? Can other behavioral responses of infants be found that indicate a preference for the attractive—for example, do infants smile more often toward attractive compared with unattractive individuals? And, what are the mechanisms underlying the infant's ability to detect and prefer attractive faces? These questions remain to be addressed by future research. The answers provided by these two studies with infants, however, seriously challenge the assumptions that attractiveness is merely "in the eye of the beholder" and that
standards of attractiveness must be learned through gradual exposure to current cultural norms.

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Received March 24, 1986
Revision received October 17, 1986
Accepted October 27, 1986