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Two studies investigated Korean college students' perceptions of babyfaced adults. The first study replicated McArthur and Apatow's (1983-1984) investigation of U.S. students' impressions of schematic adult male and female faces. The second study replicated Berry and McArthur's (1985) investigation of U.S. students' impressions of 20 young adult Caucasian male faces. The studies revealed near perfect agreement between U.S. and Korean subjects regarding the relative babyfacedness of the stimulus persons as well as very strong agreement regarding their traits. The same facial characteristics that were correlated with U.S. subjects' ratings of babyfacedness were also correlated with Koreans' ratings. In addition, like U.S. subjects, Koreans perceived babyfaced stimulus persons to possess more childlike psychological attributes than their mature-faced counterparts. The results are discussed within a theoretical framework that argues that perceptions of babyfaced adults derive from the specieswide adaptive value of analogous reactions to real babies.

CROSS-CULTURAL AGREEMENT IN PERCEPTIONS OF BABYFACED ADULTS

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Although considerable research indicates that perceptions of people's psychological attributes are strongly tied to their facial appearance (see McArthur, 1982, for a review of relevant

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research), research has only begun to answer the question of what facial characteristics communicate what psychological attributes and why they do so. Cultural conventions provide one possible explanation for particular face-trait associations. Another explanation is suggested by McArthur and Baron's (1983) ecological theory of social perception.

The ecological theory holds that a person's directly perceptible attributes, such as movements, vocal qualities, and facial appearance, provide useful knowledge about that person's behavioral affordances, which are the opportunities for acting or being acted upon that the person provides. It further holds that social perceptions serve an adaptive function either for the survival of the species or for the goal attainment of individuals. Thus according to the ecological theory, the perception of particular traits in people with particular facial configurations may reflect an adaptive detection of behavioral affordances that these faces actually reveal. The particular affordances that are detected are assumed to depend upon the perceivers' attunements, which may be innate or may depend upon the perceivers' social goals, behavioral capabilities, or perceptual experience.

Although the ecological theory assumes that social perceptions will typically be accurate, it also considers the issue of error. One reason proposed for erroneous perceptions is impoverished stimulus information. Another source of error according to McArthur and Baron (1983) is the overgeneralization of perceptions that are usually adaptive. Such errors are assumed to derive from the greater utility of overdetecting certain affordances than underdetecting them. Thus, the erroneous perception of particular traits in people with particular facial configurations may reflect the resemblance of these faces to others that do accurately communicate the traits. For example, McArthur (1985) has proposed that because it is so important to perceive the affordances that are communicated by a baby's facial appearance, these qualities may be overdetected in adults who physically resemble the young.

Consistent with predictions derived from the ecological theory, recent research in the United States has demonstrated that adults with a babyish facial appearance are perceived to have more childlike behavioral qualities than those with a more mature appearance. More specifically, McArthur and Apatow (1983-1984), using adult male and female schematic faces, manipulated features that have been identified as distinguishing infants from adults (e.g., Enlow, 1982; Guthrie, 1976). The results revealed that the infantile features of larger eyes, a shorter nose, and low vertical placement of features, which yields a large forehead and a small chin, each increased perceivers' impressions of a stimulus person's physical weakness, social submissiveness, and intellectual naivete. Keating (1985a) also found that larger eyes increased impressions of the submissiveness of schematic faces, as did a less angular face, fuller lips, or thinner eyebrows, all of which characterize an immature face (Guthrie, 1976). Berry and McArthur (1985) found similar results in a study of impressions of male college students depicted in photographs. Large, round eyes, high eyebrows, and a small chin each yielded the perception of a babyish facial appearance, and these features as well as rated babyfacedness increased perceivers' impressions of the stimulus persons' naivete, honesty, kindness, and warmth. It should be noted that these effects were independent of the perceived age and attractiveness of the faces. (See Berry & McArthur, 1986, for a review of additional research on this topic.)

According to the ecological theory, the foregoing perceptions of babyfaced adults should be culturally universal. Because maturational changes in craniofacial appearance are very similar for all humans as well as for a variety of other species (Lorenz, 1943, cited in Mussen, 1970; Todd, Mark, Shaw, & Pittenger, 1980), there should be cross-cultural consensus in the identification of babyfaced adults. Moreover, given that the detection of attributes such as weakness and dependency in babies serves a specieswide adaptive function, there should be pancultural generality in the overgeneralization of these impressions to babyfaced adults. According to the ecological theory, such pancultural generality could derive either from innate,

evolutionarily based reactions to babies or from culturally universal perceptual experiences, which attune perceivers to the affordances of an infantile facial configuration when this is personally adaptive.

Although no research has specifically addressed the question of pancultural agreement in perceptions of babyfaced adults, there is some evidence for cross-cultural generality in trait impressions based on related facial qualities. Keating, Mazur, and Segall (1981) investigated the physiognomic communication of dominance in 11 cultures, asking people which of two paired adult faces of the same sex was the most dominant. The faces included Caucasian pairs, black pairs, and Oriental pairs, and the results revealed considerable cross-cultural agreement in dominance choices. The physiognomic features that characterized faces perceived as dominant were receding hairlines, thin lips, and broad chins. These findings were interpreted in light of Guthrie's (1976) evolutionarily based postulates concerning the facial characteristics that communicate threatening qualities. However, the data are also quite consistent with the evidence on impressions communicated by age-related facial qualities. In particular, because children have lips that are proportionately larger than the lips of adults and chins that are smaller (Guthrie, 1976), Keating et al.'s findings can be taken to provide evidence for the cross-cultural generality of the tendency to perceive babyfaced adults as low in dominance.[1]

The purpose of the present pair of studies was to provide additional evidence regarding the cross-cultural generality of reactions to babyfaced adults. To this end, the research reported by McArthur and Apatow (1983-1984) and by Berry and McArthur (1985) was replicated with samples of Korean perceivers. The methodology employed in these replications was identical to that employed in the original studies with some minor changes in the dependent measures.

Based on the distinguishing characteristics of an infant's face and past research findings, it was hypothesized that the babyishness of an adult's face would increase with (1) an increasingly high forehead and/or short chin, (2) increasingly large eyes relative to the rest of the face, (3) an increasingly short nose and ears, and (4) an increasingly narrow chin. It was further hypothesized that the more babyish the features of adult faces, the more childlike their perceived psychological attributes. More specifically, it was predicted that as facial babyishness increased, perceptions of physical weakness, social submissiveness, and intellectual naivete would also increase inasmuch as babies are indeed weaker, less dominant, and less knowledgeable than adults. Impressions of two additional psychological attributes were also assessed—warmth and honesty. As noted by McArthur and Apatow (1983-1984), perceptions of these attributes cannot be so clearly predicted from the ecological theory as can perceptions of physical, social, and intellectual weakness. However, the prediction that increased babyishness of appearance would create impressions of greater honesty and warmth is consistent with the common view that children are ingenuous and affectionate. It is also supported by the results of the U.S. studies, although impressions of warmth and honesty were less independent of the physical attractiveness of faces than were impressions of physical, social, and intellectual weakness. Finally, the perceived age and attractiveness of the faces were assessed in order to rule out the possibility that the impact of facial babyishness on other impressions was mediated by one or both of these variables.

STUDY 1

METHOD

Subjects

In all, 32 male and 32 female Korean undergraduate volunteers at Seoul National University received W1000 each (approximately $1.25) for their participation in this study.

Subjects of each sex were randomly assigned to either male or female faces, to one of two basic faces (Face A or Face B), one of two random orders of the variations on the basic face, and one of two orders of trait ratings.

Stimulus Faces

The stimulus faces were identical to those employed by McArthur and Apatow (1983-1984). Two male and two female control adult faces were created by selecting different sets of hairstyles, eyebrows, eyes, noses, mouths, ears, and chins from a Smith & Wesson (1960) police Identi-kit. The sex of each control face was varied by changing the mouth and hairstyles.[2] Otherwise, male and female Face A were identical as were male and female Face B. For each of these four control, or medium-feature, faces, systematic feature manipulations created eight adult experimental faces that were either high or low in babyishness. More specifically, two faces varying in eye size were created for each of the four control faces: one with large babyish eyes and one with small, less babyish eyes. Similarly, two faces varying in feature length were created for each of the control faces: one with short, babyish features and one with long features. Feature length consisted of the length of the nose plus, for male faces only, the length of the ears. Two faces varying in feature vertical placement were also created: one with a large forehead and short chin (low vertical placement) and one with a small forehead and a long chin (high vertical placement). Finally, two faces were created in which all of the feature variations were manipulated simultaneously. Samples of these faces are depicted in Figure 1. More details regarding the construction of the faces may be found in McArthur and Apatow (1983-1984).

Dependent Measures

Trait ratings. Subjects' impressions of each of the stimulus persons were assessed by 7-point bipolar trait scales whose

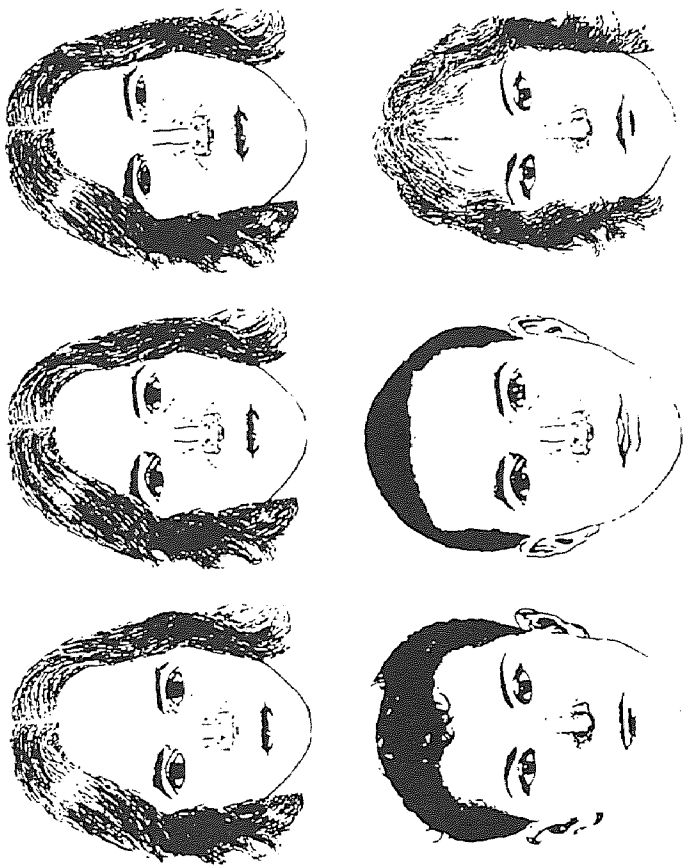

Figure 1: The top row depicts Female Face A with high babyish features, medium features (control), and low babyish features. The bottom row depicts the medium feature (control) versions of Male Face B, Male Face A, and Female Face B.

endpoints were labeled with the Korean translations of the following adjective pairs: physically weak/physically strong; submissive/dominant; naive/shrewd; cold/warm; dishonest/honest; and feminine/masculine.[3] All trait adjectives were initially translated into Korean by a Korean visiting scholar at Brandeis University. They were subsequently translated back into English by a Korean professor at Seoul National University with a resultant change in the original Korean translation of one word—naive.

Previous research by Bond and Goodman (1980) provided reason to expect cross-cultural comparability in the meanings of the trait terms. Hong Kong Chinese students' ratings of people on bipolar adjective scales like those employed in the present study yielded person perception factors comparable to the dimensions that are common to U.S., Japanese, and Filipino students' perceptions of their peers (Bond, 1979). More direct evidence that the Korean and English trait adjectives were equivalent in meaning was provided by comparing the relationships among the English trait terms to the relationships among their Korean counterparts. The correlation matrix for trait ratings by U.S. subjects was very similar to the correlation matrix for the corresponding five trait ratings by Korean subjects, yielding a highly significant intermatrix correlation, $r(8) = .81$, $p < .01$ (Block, 1957).

Physical appearance ratings. Subjects' assessments of the babyfacedness and the attractiveness of each stimulus person were assessed by 7-point bipolar scales whose endpoints were labeled with the Korean translations of *babyface/mature face* and *not at all attractive/very attractive*. The perceived age of each face was assessed on a 8-point rating scale with endpoints labeled <18 and >35 and with the six intermediate points each specifying a 3-year age span (e.g., 18-20, 21-23, and so on).

Procedure

Two experimenters were present at each experimental session—an American female experimenter who ran the slide projector and a Korean male experimenter who read the instructions to subjects and answered any questions. Subjects were given a copy of the rating scales with a cover sheet containing a Korean translation of the instructions employed by McArthur and Apatow (1983-1984). In all other respects the procedure was identical to the U.S. study.

RESULTS

Overview of the Data Analyses

Two sets of analyses were performed on the data. First, correlations between Korean and U.S. subjects' ratings of the schematic faces were computed to assess cross-cultural agreement in impressions. Second, paralleling McArthur and Apatow (1983-1984), analyses of variance were performed on Korean subjects' physical appearance ratings and the trait ratings for each of the four feature-group manipulations, utilizing sex of subject (2), basic face (2), and sex of face (2) as between-subjects factors. Because each subject rated high, medium, and low babyish versions of the same face, the three-level babyishness variable (all features, feature vertical placement, eye size, or feature length) was a within-subjects factor.

The overall analyses were followed by linear trend analyses with one degree of freedom to test the specific hypothesis that there would be a linear relationship between feature babyishness and impressions.[4] Table 1 reports Korean and U.S. subjects' mean ratings on each dependent measure for each feature group as well as F values for the overall effects, the linear trend effects, and the residual quadratic effects. The results of the linear trend analyses are fully reported in the text, but the quadratic effects are discussed only when they are as strong or stronger than the predicted linear trends. Significant interactions between feature babyishness and basic face, sex of face, or sex of subject were followed by simple-effect linear trend analyses to determine the significance of the predicted babyishness effect for faces of each type and sex and for subjects of each sex. In the interest of brevity, these interaction

TABLE 1

Mean Ratings by Korean and U.S. Subjects of Schematic Faces Varying in Eye Size, Vertical Placement of Features, and Length of Features

		All Feature Babyishness						Vertical Placement				
Rating	Sample	medium[a]	high	low	F(tot)	F(lin)	F(Quad)	low	high	F(tot)	F(lin)	F(Quad)
Babyface	Korean	3.8	5.4	2.0	73.5	147.3	<1	3.7	2.5	18.3	27.2	9.5
Age	U.S.	3.3	1.3	5.3	217.6	435.3	<1	2.2	4.7	76.9	153.8	<1
	Korean	4.8	3.9	6.3	30.7	60.9	<1	5.1	5.8	7.7	6.9	8.4
Attractive	U.S.	4.1	2.3	2.1	61.1	<1	121.3	3.1	3.4	16.5	3.1	29.9
	Korean	4.4	2.6	2.8	27.2	<1	53.9	3.5	3.8	5.3	1.4	9.3
Physically Weak[b]	U.S.	3.7	6.3	1.9	424.7	828.9	20.5	5.1	2.6	151.0	301.9	<1
	Korean	3.4	5.9	2.3	90.8	173.6	8.6	4.9	2.4	46.5	91.4	1.3
Submissive[b]	U.S.	4.1	6.3	2.0	271.7	543.3	<1	5.2	2.7	132.5	255.4	9.6
	Korean	3.9	5.6	3.0	37.1	72.0	2.6	4.8	2.8	30.4	60.7	<1
Naive[b]	U.S.	3.7	6.1	2.8	62.1	116.3	7.9	4.9	3.0	26.4	51.7	1.1
	Korean	4.4	4.6	3.1	12.0	20.1	3.9	4.6	3.7	6.1	10.6	1.5
Warm	U.S.	4.1	4.6	2.3	60.1	110.4	9.8	4.2	3.8	3.3	3.0	3.6
	Korean	3.8	3.8	3.7	<1	<1	<1	4.3	4.0	1.7	1.2	2.2
Honest	U.S.	4.8	5.1	2.5	82.1	128.4	35.8	4.6	4.0	10.6	8.1	13.1
	Korean	4.8	3.9	2.8	23.8	15.4	32.2	3.8	3.9	8.0	<1	16.0

		Eye Size					Feature Length				
Rating	Sample	big	small	F(tot)	F(lin)	F(Quad)	short	long	F(tot)	F(lin)	F(quad)
Babyface	Korean	4.2	2.4	38.1	70.8	5.8	3.6	3.1	6.9	6.6	7.1
Age	U.S.	2.5	4.2	49.7	90.2	9.2	3.0	3.9	13.8	26.6	1.0
	Korean	4.4	6.2	43.5	81.0	6.0	4.8	5.3	5.3	9.4	1.2
Attractive	U.S.	4.4	2.5	72.3	124.8	19.8	4.2	4.0	1.3	<1	2.0
	Korean	4.2	2.9	32.3	43.6	21.1	4.4	4.8	2.5	3.4	1.6
Physically Weak[b]	U.S.	4.3	2.6	53.6	105.1	2.1	3.9	3.4	7.2	14.3	<1
	Korean	3.8	4.1	3.7	1.0	6.4	3.7	3.9	2.2	<1	3.8
Submissive[b]	U.S.	4.7	2.4	74.7	149.4	<1	3.9	3.7	1.1	<1	1.6
	Korean	3.9	3.7	<1	<1	<1	3.7	3.6	<1	<1	<1
Naive[b]	U.S.	4.5	2.6	22.8	45.0	<1	4.2	3.4	4.6	9.2	<1
	Korean	4.3	3.0	17.4	24.4	10.6	4.4	4.4	<1	<1	<1
Warm	U.S.	5.0	2.2	122.7	245.5	<1	4.4	4.0	4.7	7.6	1.7
	Korean	4.0	3.1	7.8	13.8	1.9	4.0	4.2	1.5	<1	2.5
Honest	U.S.	5.5	2.4	170.7	289.1	52.3	4.8	4.5	2.8	4.1	1.5
	Korean	4.9	2.6	63.8	101.4	26.8	4.8	4.5	1.2	2.0	<1

NOTE: All ratings were made on 7-point scales, except for age, which was rated on an 8-point scale. For the U.S. sample, cell N = 96, except for ratings of shrewd and believe story, where N = 32. For the Korean sample, cell N = 64.

a. This control face served as the medium feature face in each of the four feature groups.

b. The poles of these scales in the McArthur and Apatow (1983-1984) study have been reversed here; so the U.S. means are coded in the same direction as the Korean means.

effects are reported only when they qualify a predicted babyishness effect.

Comparison of Korean and U.S. Trait and Physical Appearance Ratings

The mean ratings for faces with a particular feature manipulation (e.g., large eyes, short features, and so on) were computed by collapsing across the four faces with that feature. Correlations between the mean rating of each face obtained from Korean subjects with the corresponding mean rating obtained from U.S. subjects revealed very strong cross-cultural agreement in impressions of the schematic faces on all dimensions (see Table 2).

Impact of Babyish Features on Physical Appearance Ratings

Babyfacedness, perceived age, and attractiveness. As predicted, the analyses of variance revealed a significant linear increase in the perceived babyfacedness of the stimulus persons as the babyishness of all features increased, as eye size increased, and as feature vertical placement decreased, all p's $< .0001$. These effects held true for subjects of both sexes and for both male and female faces. However, a vertical placement × basic face interaction effect, $F(2, 112) = 6.34$, $p = .002$, revealed that the tendency to perceive faces with low feature placement as more babyfaced than those with high feature placement was significant for face B, $F(1, 112) = 36.55$, $p < .0001$, but not for face A, $F(1, 112) = 1.77$, $p = .19$. Although decreased feature length was linearly related to perceived babyfacedness, as had been predicted, $p < .01$, this effect was qualified by an equally strong quadratic trend, reflecting lower babyface ratings for the long-featured face than for either of the others.

As was true for U.S. raters, the babyfacedness ratings were paralleled by significant variations in the perceived age of the

TABLE 2
U.S.-Korean Agreement for Trait and Physical Appearance Ratings

Dependent Measure	Study 1: Schematic Faces	Study 2: Photographed Faces
Trait Ratings		
naivete	.85***	.60**
warmth	.72**	.85***
honesty	.90***	.81***
physical weakness	.87***	--
submissiveness	.91***	--
Physical Appearance Ratings		
babyfacedness	--	.94***
attractiveness	.95***	.47*
age	.91***	.87***

NOTE: df = 7 in Study 1 and 18 in Study 2. Babyfacedness was not rated by U.S. subjects in Study 1, and weakness and submissiveness were not rated by U.S. subjects in Study 2.
*p < .05; **p < .01; ***p < .001, two-tailed.

stimulus persons. The attractiveness ratings also paralleled those made by U.S. subjects. All of the effects on perceived age and attractiveness held true for both basic faces, both male and female faces, and subjects of both sexes.[5]

Impact of Babyish Features on Trait Ratings

Because the feature manipulations often had a significant impact on the perceived age and attractiveness of the faces in addition to their intended impact on perceived babyfacedness, analyses of covariance, controlling for age and attractiveness ratings, were performed on subjects' trait ratings in addition to the analyses of variance. Because the results of the covariance

analyses did not qualify the analysis of variance effects, they will not be discussed except to state that all of the feature manipulation effects reported below held up when age and attractiveness ratings were controlled just as they had for U.S. subjects. Also, all effects reported held true for both basic faces, both male and female faces, and subjects of both sexes.

Overall babyishness. As the babyishness of all features increased, there was an increase in Korean subjects' perceptions of the weakness, submissiveness, and naivete of the stimulus persons, just as there had been for U.S. subjects, p's $< .0001$. Whereas high babyishness had also been linearly related to U.S. subjects' ratings of warmth and honesty, this effect was significant only for the honesty ratings made by Korean subjects. The linear trend in Koreans' ratings, $p < .001$, was qualified by a quadratic effect, $p < .0001$, which reflected a tendency to rate stimulus persons intermediate in babyishness as more honest than those who were high or low. Although the quadratic effect was also significant among U.S. subjects, it did not overshadow the linear effect.

Feature vertical placement. As feature vertical placement decreased, there was an increase in Korean subjects' perceptions of the weakness, submissiveness, and naivete of the stimulus persons just as there had been for U.S. subjects, p's $< .0001$, $< .0001$, and $< .001$, respectively. As was true for U.S. subjects, feature vertical placement had no effect on Koreans' perceptions of the stimulus person's warmth, and it had a curvilinear effect on their perceptions of the stimulus persons' honesty: Faces with a medium vertical placement of features received the highest honesty ratings just as they had in the U.S. sample, $p < .001$.

Eye size. Whereas larger eyes were associated with more weakness and more submissiveness in the U.S. subjects' ratings, eye size had no linear impact on Korean subjects' ratings on these dimensions. However, there was a significant quadratic trend for weakness, reflecting a tendency to perceive the faces with small eyes as the weakest followed by large and medium eyes, $p < .01$. The impact of eye size on Koreans' perceptions of the stimulus persons' naivete, warmth, and honesty did parallel the effects for U.S. subjects. More specifically, as eye size increased, there was a linear increase in Koreans' ratings of the naivete, warmth, and honesty of the stimulus persons, p's $< .0001$, $.001$, and $.0001$, respectively.

Feature length. Whereas shorter noses and ears were associated with more weakness, naivete, warmth, and honesty in the U.S. sample, feature length had no significant effect on Korean subjects' ratings of the faces on these dimensions.

DISCUSSION

Korean students' impressions of the schematic faces provide strong evidence for the cross-cultural generality of reactions to babyfaced adults. The simultaneous manipulation of the babyishness of all features had the same positive impact on Korean and U.S. students' ratings of the stimulus persons' physical weakness, submissiveness, and naivete, and these effects were independent of variations in perceived age or attractiveness.

As was true in the U.S. study, impressions of honesty were less consistently affected by variations in facial babyishness than were impressions of weakness, submissiveness, and naivete. More specifically, perceived honesty showed a curvilinear rather than a linear relationship with overall babyishness and feature vertical placement, paralleling perceived attractiveness. These data suggest that faces with feature placements that deviate markedly from the average adult may be rated lower on *evaluative* dimensions, like honesty and attractiveness, albeit not on *potency* dimensions, like weakness, submissiveness, and naivete. The higher evaluative ratings of the medium feature faces could reflect exposure effects (e.g., Zajonc, 1968). This interpretation suggests that variations in

the babyishness of *real* adult faces may not be curvilinearly related to attractiveness or honesty inasmuch as such faces, unlike the *schematic* ones, may not vary in familiarity.

Like the overall babyishness manipulation, the individual feature variations yielded significant parallels between U.S. and Korean ratings. Feature vertical placement had the same impact on both groups' impressions of the stimulus persons along all trait dimensions, and the individual manipulation of eye size had the same impact on Korean and U.S. ratings of naivete, warmth, and honesty. However, the linear impact of eye size on U.S. subjects' ratings of weakness and submissiveness was not replicated in the Korean sample, and feature length, which had the weakest impact on U.S. trait ratings of the individual babyishness manipulations, had no significant impact on the parallel Korean ratings.

It should be noted that although feature length and eye size did not significantly affect various trait ratings when they were manipulated alone, one or both seem to have added to the babyishness effect when manipulated together with the other features. For example, the difference between the high and low all-feature-babyishness means for physical weakness was larger than the difference between the low and high vertical-placement means although vertical placement was the only individual feature manipulation to have a significant effect on this rating. Indeed, the independent effects of eye size and feature length on weakness ratings were not even in the predicted direction. Thus eye size or feature length did contribute something to the impact of all-feature-babyishness on Korean subjects' ratings of physical weakness. The finding that the impact of overall babyfacedness was greater than the sum of its individual elements is consistent with the ecological argument that socially important attributes are most clearly revealed in configural stimulus properties (McArthur & Baron, 1983).

Morphological differences between Korean and Caucasian faces provide one possible explanation for the differential impact of eye size and feature length on Korean and U.S. trait ratings. The tendency for adult and infant faces to be strongly differentiated by relative nose length is probably stronger for

Western than Oriental faces, given that even adult Oriental faces have relatively small noses.[6] Thus the failure of feature length to have the predicted impact on Korean subjects' trait ratings may be due to the fact that relative nose length is not a salient marker of the maturational status of Oriental faces. Consistent with this argument, the nose length manipulation failed to produce the predicted variations in perceived babyfacedness for Korean subjects.

One might also propose that morphological differences between Oriental and Western faces could explain the weaker impact of eye size on Korean trait ratings. However, the data are not consistent with this suggestion. Koreans showed a very strong tendency to rate the stimulus persons with large eyes as more babyfaced than those with small eyes. This finding is consistent with the fact that the transformation of relative eye size that occurs with age is universal across races despite differences in eye structure. Not only did large eyes appear babyish to Koreans, but also they created the impression of naivete, warmth, and honesty for Koreans just as for U.S. subjects. The question to be answered then is "Why did eye size fail to influence Koreans' impressions of weakness and submissiveness?"

One possible explanation implicates the extreme manipulations of eye size in the schematic faces. In certain contexts, staring eyes can communicate threat and dominance (e.g., Dovidio & Ellyson, 1985). Because the large eyes in the schematic faces were quite exaggerated in size as compared with adult Caucasian eyes and even more so if compared with adult Korean eyes, these eyes may have been perceived by Koreans as staring when manipulated independently of other babyish features. And, when the rating scales made threat and dominance salient, the tendency for large eyes to communicate a dominant stare may have offset their tendency to communicate babyishness. On the other hand, when the rating scales did not make threat or dominance salient, or when large eyes were combined with other babyish features, then the babyishness effect prevailed.

STUDY 2

The possibility that the "supranormal" babyish eyes in the schematic faces were responsible for the failure of eye size effects to replicate for Korean subjects' ratings of submissiveness and weakness was assessed in Study 2, which investigated impressions of real male faces as a function of natural variations in feature babyishness, including eye size. A second purpose of Study 2 was to compare Koreans' impressions with those formed of the same faces by U.S. subjects. A third purpose was to determine what physiognomic qualities characterize Caucasian male faces that are perceived as babyfaced by Korean subjects and to compare these qualities to those that characterize faces perceived as babyfaced by U.S. subjects. Finally, in investigating the effects of naturally occurring feature variations, Study 2 assessed the possibility that nonnormative feature vertical placements were responsible for the curvilinear relationship between facial babyishness and the perceived attractiveness and honesty of schematic faces in Study 1.

METHOD

Subjects

A total of 24 male and 24 female Korean undergraduate volunteers at Seoul National University received W1000 each (approximately $1.25) for their participation in this study. Subjects of each sex were randomly assigned to one of two random orders of faces and to one of two orders of trait ratings.

Procedure

Subjects were shown black and white slides depicting the head and shoulders of 20 Caucasian male college students that had been employed by Berry and McArthur (1985). Objective measurements of various physiognomic characteristics of the

stimulus faces were also taken from Berry and McArthur (1985; see Table 3). Trait and physical appearance ratings were identical to those employed in Study 1, as were all other aspects of the procedure.

RESULTS

Reliability

Spearman-Brown reliability indices calculated among the 48 subjects' ratings of the stimulus faces ranged from .92 to .98. Having established acceptable interjudge reliability, the mean rating of each stimulus face on each dependent measure was calculated for use in subsequent analyses. Because the reliabilities were equally strong for male and female subjects, and there were no sex differences in the analyses presented below, the reported results have been collapsed across sex of subject.

Comparison of Korean and U.S. Trait and Physical Appearance Ratings

Correlations between the mean rating of each face obtained from Korean subjects with the corresponding U.S. rating revealed very strong agreement regarding those trait and physical appearance measures common to the two samples (see Table 1). Moreover, the near perfect agreement regarding the relative babyfacedness of the 20 faces is consistent with the assumption that it is facial babyishness that mediates commonalities in U.S.-Korean trait ratings. To further test this assumption, the relationships between babyface ratings and trait ratings in the two samples were compared.

Impact of Babyfacedness on Trait Ratings

Correlation coefficients calculated between the mean trait ratings and the mean babyface rating for each of the 20 faces

TABLE 3
Correlations of Measured Physiognomic Features with Babyfacedness

	Sample	
Facial Measurements	Korean	U.S.
eye size (large)	+.37	+.40*
eye shape (round)	+.49**	+.51**
forehead height (high)	-.12	+.03
chin width (narrow)	+.49**	+.61***
nose length (long)	+.07	+.21
nose width (narrow)	+.32	+.36
distance between eyes (wide)	-.37	-.36
eyebrow height (high)	+.37	+.43*
cheek width (narrow)	+.37	+.30
chin height (short)	+.26	+.22
forehead width (wide)	-.12	-.18
Configural Measures		
vertical placement (low)	-.02	+.11
forehead area (large)	-.18	-.03
chin area (large)	-.47**	-.58***
nose area (large)	-.10	+.03

*p < .01; **p < .05; ***p < .01, two-tailed; df = 18.

revealed effects for Korean subjects paralleling those for U.S. subjects: Stimulus persons who were rated high in babyfacedness were also rated high in warmth, naivete, and honesty. In addition, highly babyfaced persons were perceived as physically weaker and more submissive, which is consistent with U.S. and Korean subjects' ratings of schematic babyfaces (see Table 4). Unlike impressions of the schematic faces in Study 1, the real faces did not yield a curvilinear relationship between babyfacedness and honesty or attractiveness as evidenced by nonsignificant quadratic terms in regression analyses predicting these ratings from babyfacedness. Finally, partial correlation analyses revealed that the impact of babyfacedness on Korean subjects' impressions of the stimulus persons was independent of their perceived age and attractiveness, just as it had been for U.S. subjects (see Table 3).[7]

Physiognomic Determinants of Babyfacedness

The relationship between physiognomic measures and babyfacedness. Intercorrelations between the measured facial features and ratings of facial babyishness revealed that for Korean as for U.S. perceivers, increases in eye roundness as well as decreases in chin width and overall chin area were significantly associated with higher babyfacedness ratings. In addition, eye size and eyebrow height were significantly related to babyfacedness ratings for U.S. subjects and marginally related for Korean subjects (see Table 3).

The physiognomic composite. Berry and McArthur (1985) constructed an overall physiognomic index of babyfacedness via a stepwise multiple regression analysis that identified chin width and eye size as the best predictors of U.S. subjects' babyface ratings. This composite was also significantly correlated with Korean subjects' babyface ratings. The partial correlation between the U.S. composite and Korean babyface ratings, controlling for age and attractiveness ratings, was even more significant, and comparable in magnitude to the corresponding partial correlation for U.S. subjects (see Table 5).[8]

TABLE 4
Correlations and Partial Correlations of Babyfacedness with Trait and Physical Appearance Ratings

Dependent Measure	Sample	Zero Order Correlation	Partial Correlation
Trait ratings			
Physical Weakness	Korean	.65**	.62**
Submissiveness	Korean	.72***	.78***
Naivete	Korean	.49*	.52*
	U.S.	.81***	.74***
Warmth	Korean	.48*	.72***
	U.S.	.77***	.77***
Honesty	Korean	.41	.47*
	U.S.	.70***	.70***
Physical Appearance Ratings			
Attractiveness	Korean	-.02	
	U.S.	.38	
Age	Korean	-.91***	
	U.S.	-.84***	

NOTE: The partial correlations control for perceived age and attractiveness. Physical weakness and submissiveness were not rated by U.S. subjects. df = 18 for zero order correlations; df = 16 for partial correlations.
*p < .05; **p < .01; ***p < .001, two-tailed.

Correlations and partial correlations, controlling for age and attractiveness ratings, revealed that the physiognomic composite was significantly correlated with Koreans' ratings of the stimulus persons' weakness and submissiveness. Moreover, eye size alone was strongly associated with these impressions, r's (18) = .61 and .62, p's $< .01$, and these positive relationships held up when age and attractiveness ratings were controlled. The composite was also significantly correlated with ratings of the stimulus persons' warmth when age and attractiveness were controlled, but it did not predict Korean subjects' ratings of naivete and honesty as it had for U.S. subjects.

TABLE 5
Correlations and Partial Correlations of the Physiognomic Composite with Trait and Physical Appearance Ratings

Dependent Variable	Sample	Zero Order Correlation	Partial Correlation
Trait Ratings			
Physical Weakness	Korean	.61**	.56*
Submissiveness	Korean	.62**	.58*
Naivete	Korean	.23	.27
	U.S.	.78***	.63**
Warmth	Korean	.30	.50*
	U.S.	.60**	.66**
Honesty	Korean	.02	.16
	U.S.	.62**	.58*
Physical Appearance Ratings			
Babyfacedness	Korean	.47*	.66**
	U.S.	.76***	.59**
Attractiveness	Korean	-.24	
	U.S.	.35	
Age	Korean	-.28	
	U.S.	-.33	

NOTE: The partial correlations control for perceived age and attractiveness. Physical weakness and submissiveness were not rated by U.S. subjects. df = 18 for zero order correlations; df = 16 for partial correlations..
*p < .05; **p < .01; ***p < .001, two-tailed.

DISCUSSION

Study 2 provides impressive evidence for the cross-cultural generality of reactions to babyfaced adults. Agreement between U.S. and Korean subjects regarding the relative babyfacedness of 20 young Caucasian males was near perfect, something that one would expect if an object physical quality, such as hair color, were being judged. Indeed, U.S.-Korean agreement

regarding the babyfacedness of the stimulus persons was somewhat higher than agreement regarding their chronological age, and it was considerably higher than agreement regarding the more subjective quality of attractiveness.

Not only did Korean and U.S. subjects agree as to who was babyfaced, but also the impact of babyfacedness on their trait ratings was strikingly similar. Moreover, the same facial features that were correlated with U.S. ratings of babyfacedness were also correlated with Korean ratings, and a physiognomic composite of those features that had best predicted U.S. babyface and trait ratings also predicted Koreans' ratings. The fact that both the physiognomic composite, which included eye size and chin width, and eye size alone, significantly predicted Koreans' impressions of the weakness and submissiveness of real male faces supports the suggestion that the failure of eye size to influence these impressions in Study 1 was due to the exaggerated size and staring quality of the schematic face eyes. Similarly, the fact that babyishness did not show a curvilinear relationship to the perceived attractiveness or honesty of real faces supports the suggestion that the curvilinear effects in Study 1 were due to the exaggerated feature vertical placements in the schematic faces.

While the physiognomic index of babyfacedness had predicted all of the U.S. trait ratings, this index did not predict Korean subjects' impressions of naivete and honesty, whereas their babyface ratings had. Further research, assessing still other facial qualities, is needed to uncover those that are responsible for the positive association between Koreans' babyface ratings and their impressions of the stimulus person's naivete and honesty.

The finding that large, round eyes and a narrow chin produced the perception of a babyish facial appearance is consistent with morphological differences between the infant and adult face (Enlow, 1982). The finding that high eyebrows were associated with facial babyishness is consistent with ethologists' observation that brows are typically lowered on dominant primates and raised on submissive ones (e.g., Andrews, 1965) as well as with the findings of Keating et al.

(1981), although the effects of an expressively—as opposed to structurally—low brow that were documented by these authors were restricted to Western samples. Finally, the effect of eyebrow height is also consistent with Guthrie's (1976) suggestion that high eyebrows are a sign of youth because children typically look up at adults, raising their eyebrows. The lack of effects for either forehead size or nose size was unexpected in the original U.S. study, and Berry and McArthur's (1985) discussion of the failure to find effects for these facial characteristics may be applied to the Korean replication as well.

The strong Korean-American agreement in perceptions of Caucasian babyfaced adults is particularly impressive when one considers the relatively meager exposure that Korean students have to such faces. Although Korean products are very familiar to Westerners, Western people are not very familiar to Koreans. Even the university campuses are not very cosmopolitan. The top-ranked institution in the country, where the present research was conducted, has no foreign students and only a handful of foreign faculty visitors. Indeed, the graduate student serving as an experimenter for this research informed the author that she was the first person with whom he had ever spoken English.

It must be acknowledged that Korean students do see Western movies. However, the question remains as to how such exposure to Western faces could account for the results of the present studies. It seems rather farfetched to suggest that Koreans have learned from movies what kinds of faces Westerners perceive as babyfaced and how Western people with such faces behave. It seems far more plausible to suggest that Koreans' impressions of Westerners with relatively large eyes and small chins derive from analogous perceptions of babies, who have this facial configuration in Korea as well as in the United States.

Whereas some would argue that impressions of people with an infantile facial configuration reflect innate, evolutionarily based reactions (e.g., Keating, 1985b; Lorenz, 1943, cited in Mussen, 1970), McArthur and Baron's (1983) ecological

theory allows an additional possibility. These impressions could derive from perceptual experiences with babies. Such experience could attune perceivers to the affordances of an infantile facial configuration insofar as such an attunement is adaptive for the goal attainment of the perceiver. To differentiate empirically between these two possibilities would require assessing reactions to babyfaced adults among people who have had little or no exposure to babies, such as very young children.

Whether Korean-American agreement in perceptions of babyfaced adults reflects an innate reaction to an infantile facial configuration or whether it reflects universal experiences with babies, these data are extremely interesting in their own right. The near perfect agreement between Korean and U.S. perceivers' babyface ratings indicates a shared sensitivity to age-related styles of facial change that are independent of racial variations in facial structure. The strong agreement between Korean and U.S. perceivers' trait ratings further indicates a shared tendency for the facial configuration of babyfaced adults to elicit reactions analogous to those elicited by babies. Although this study compared only two cultures, the fact that these two differ markedly both in cultural traditions and in facial structure strongly suggests that the effects reported here will replicate in additional cultures.

NOTES

1. Keating's (1985b) assumption that facial characteristics vary in dominance cues and our assumption that they vary in babyishness differ in two ways. First, our babyishness dimension is unipolar, whereas Keating's dimension is bipolar: Keating postulates that babyish characteristics are nondominance cues and that characteristics associated with successful intraspecific competition are dominance cues. Second, reactions to facial dominance cues would seem to presume an evolutionary basis, whereas reactions to babyishness cues may derive from universal learning experiences.

2. Mouths were varied because the variations in hairstyle available in the 1960 Identikit were not sufficient to create believable female faces. Keating's (1985a) finding that lip thickness influences impressions does not present a problem for this study inasmuch as the effects of the feature manipulations under investigation held true regardless of the target face's mouth style—that is, for male and for female faces.

3. Because the trait dimension feminine-masculine was not included in the U.S. research, the results for this measure will not be reported.

4. The variations in features from high to medium to low babyishness were equal interval as required for trend analyses.

5. Although the overall quadratic and linear effects for attractiveness paralleled U.S. ratings, the U.S. sex of face × feature babyishness effects, reflecting higher ratings for high than for low babyish females and the reverse for males, were not significant for Koreans. This may reflect less sexual dimorphism in Oriental than Caucasian faces.

6. In keeping with this observation, the first author discovered during her stay in Korea that the first Western visitors there were called "bignoses."

7. Correlations between trait ratings and attractiveness revealed that the well-documented halo effect in Westerners' impressions of people was replicated for Koreans. People rated higher in attractiveness were perceived to be warmer and more honest, both p's $< .01$, whereas there was no significant relationship between attractiveness and trait ratings that do not tap an evaluative dimension: physical weakness, submissiveness, naivete.

8. Greater similarity between the U.S. and Korean partial than zero order correlations reflects the fact that the physiognomic composite correlated positively with U.S. attractiveness ratings, and negatively with Koreans' ratings. Coupled with the failure of Koreans to replicate the U.S. positive correlations between rated babyfacedness and attractiveness, this suggests that babyfaced males are viewed as more attractive by Americans than by Koreans. On the other hand, babyish features that did not enter into the U.S. composite—a high forehead and low vertical placement of features—were positively correlated with Koreans' attractiveness ratings, p's = .01 and .06, but not with U.S. attractiveness ratings. No other measured facial features were significantly related to attractiveness ratings for either sample.

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This study of the sources and patterns of occupational stress experienced by Israeli faculty members is a partial replication of a study of faculty stress in American universities reported by Gmelch, Lorvich, and Wilke (1983, 1984). A total of 100 faculty members drawn from all Israeli universities were sampled. They were asked to fill out a Hebrew version of the questionnaire developed by Gmelch et al. to measure the degree of stress resulting from various sources and the overall intensity of stress experienced on the job. Comparison of the responses to the questionnaire revealed a high degree of similarity between the two cultures in the patterns of the results. Both the Americans and the Israelis ranked the sources of stress similarly. The intensity of stress experienced by Israelis, however, was reportedly lower than that of their American colleagues. Possible explanations for this difference are offered.

STRESS IN ACADEME
A Cross-Cultural Comparison Between Israeli and American Academicians

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The causes of occupation stress and the mechanisms employed by workers to deal with it have recently drawn the attention of researchers from various disciplines (Cooper, 1980; Holt, 1982; Mclean, 1984; Phillips, 1982). This interest may have been motivated by findings relating stressors at work to workers' physical well-being (e.g., Glass, 1977), mental health (Colligan & Murphy, 1979), satisfaction with life and work (Iris & Barrett, 1972; Caplan, Cobb, French, Harrison, & Pinneau, 1975), and labor productivity (Mangione & Quinn, 1975).

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