

SSSP

**Power, Dominance, and
Nonverbal Behavior**

*Edited by
Steve L. Ellyson and
John F. Dovidio*



Springer-Verlag
New York Berlin Heidelberg Tokyo

Chapter 5

Human Dominance Signals: The Primate in Us

Caroline F. Keating

Introduction

The primate facility for nonverbal expression is largely owed to the evolution of specialized, communicative features conspicuously clustered about the face (Darwin, 1872/1965; Gregory, 1929/1965; Huber, 1930a, 1930b; Rinn, 1984). Non-human primates use the expressive abilities of the face to communicate social dominance information. Among group-living species of monkey and ape, certain facial signals correspond to an animal's position in a dominance hierarchy (Jolly, 1972; Mazur, 1973; Wilson, 1975). These facial signals help maintain dominance or "status" relationships by permitting species members to forecast probable success or failure during competitive interactions with conspecifics.

Status messages may be relayed through facial expressions or morphology. Facial expressions conveying dominance and submissiveness are well-documented for many species of monkey and ape (e.g., Redican, 1975; van Hooff, 1967). Several theorists have argued that there is evolutionary continuity between the facial expressions of nonhuman primates and humans (Andrew, 1963a, 1963b; Darwin, 1872/1965; Hewes, 1973; Steklis & Raleigh, 1979), so perhaps comparable facial gestures characterize human dominance interactions. Morphological aspects of the face act as signalling devices for many mammals and birds (Lorenz, 1943) and may communicate status information between humans (Guthrie, 1970). The research presented in the present chapter indicates that human interactions incorporate both facial gestures and structures that convey social dominance information much as they do for nonhuman primates.

Commonalities between human and nonhuman primate gestures or structures may indicate either homologous or analogous origins. Both homologies and analogies designate traits that are common to different species and similar in form and function. Homologies, however, refer to traits resulting from a common genotype inherited from a shared ancestor, whereas analogies refer to characteristics emerging from independent evolutionary ancestries. The closer the phyletic relationship between species, the more likely a homologous basis for a particular

trait: in other words, the more likely the trait for each species is due to a common, evolutionary history. To the degree that many, widely diverse species share a trait, its independent evolution in each species is implicated (Eibl-Eibesfeldt, 1975; Mayr, 1976).

The "cross-species-cross-cultural" approach presented in this chapter is used to identify primate homologues and analogues in human nonverbal dominance communication. This approach incorporates two strategies. First, the behavioral traits of present-day primates are used to infer those of the evolutionary ancestors shared by all primates, including humans (Mazur, 1973; Napier & Napier, 1967). Traits that are present among numerous nonhuman primate species are expected to be found among humans, as well, due to phylogenetic influences. Thus the "cross-species" strategy comprises the careful identification of nonhuman primate behavioral traits likely to reveal human counterparts. If a trait is largely exclusive to the primate order, then behavioral homologues are suggested. Traits common not only to primates but also to species with different phylogenies suggest behavioral analogues.

The second strategy entails cross-cultural tests of hypotheses generated from cross-species analyses. Can traits common to nonhuman species be revealed as human universals? For example, a gesture identified as a nonhuman primate dominance signal might be portrayed by humans and viewed by observers from different cultures who then render interpretations of the expression. Pancultural invariance in the social perceptions of such a gesture may then be construed as genetically influenced as long as the populations sampled are culturally distinct from one another.

The cross-species-cross-cultural approach to two major research themes will be presented in this chapter. The first theme focuses on social perceptions of human versions of nonhuman primate dominance and appeasement gestures. The second theme involves particular physiognomic cues that convey dominance messages in a variety of species and, it seems, among humans, as well.

Perceiving Social Dominance from Facial Gestures

The first research theme recognizes the role of facial expression in the communication of dominance. A study of reports by ethologists (e.g., Andrew, 1963a; Redican, 1975; van Hooff, 1967) reveals two gestures common to the dominance displays of many nonhuman primate species: These behaviors are eyebrow gestures and mouth gestures. The discovery that similar gestures convey dominance information among humans from diverse cultural background would implicate behavioral homologues.

Eyebrow Gestures

Some expressions characterizing the dominance encounters of nonhuman primates involve eyebrow position. Generally, the brows are lowered on dominant or threatening individuals and raised on submissive or receptive individuals (Andrew, 1963a, 1963b; Bolwig, 1964; Dixon, 1977; Hinde & Rowell, 1962; Jolly, 1972; Redican, 1975; van Hooff, 1967; Vine, 1970). Theorists have speculated on the

evolutionary origins of facial gestures. Darwin (1872/1965) believed that many expressions evolved from "serviceable associated habits" or preparatory responses associated with attack, defense, locomotion, or changes in visual or respiratory functioning. Several current theorists agree (Andrew, 1963a, 1963b; Ekman, 1972; Izard, 1971). Selective pressures apparently shaped certain elements of preparatory or supportive responses into displays that reflected the original impetus of the behavior (Andrew, 1963a). Thus, submissive brow raising may have evolved by originally aiding the visual scanning of animals in threatening circumstances (Andrew, 1963b; Darwin, 1872/1965). Because lowered brows protect the eyes from physical harm and facilitate near-focusing during attack, perhaps this behavior evolved as a dominance gesture by forecasting physical aggression (Andrew, 1963a).

Several human ethologists have linked particular brow positions to agonistic episodes among humans (Blurton Jones, 1971; Brannigan & Humphries, 1972; Grant, 1969). The findings from these different reports converge on the same conclusion: The assertive individual in a dispute typically displays lowered or frowned brows, drawing the brows together and down over the bridge of the nose. Although brow frowns have occasionally been related to such states as puzzlement (Darwin, 1872/1965; Grant, 1969; Young & Gouin-DeCarie, 1977) or distress (Leventhal & Sharp, 1965), the relationship between lowered brows and assertive behavior has been corroborated by Camras (1977) in a laboratory experiment where children competed for an attractive toy. Camras (1977) found that lowered-brow expressions related to the expressor's resistance to an opponent's attempt to acquire the toy and tended to delay those attempts. Other experimental evidence has shown that adult recipients of lowered-brow stares were more physiologically aroused than those receiving raised-brow stares and thus perhaps more threatened (Mazur, Rosa, Faupel, Heller, Leen, & Thurman, 1980).

There is some support for the contention that brow raising signals submissiveness during human social encounters. Blurton Jones (1971) found that raised brows correlated with "the tendency to flee" during children's disputes. Children and adults exhibit brow raising when pleading and making verbal requests (Birdwhistell, 1968; Blurton Jones, 1971). Brow raising has also been observed during greeting (Eibl-Eibesfeldt, 1972), a situation in which the signalling of nonthreat would help reduce the risk of alerting competitive or nonreceptive responses (van Lawick-Goodall, 1968). Eibl-Eibesfeldt (1972) has interpreted raised brows as a pancultural greeting gesture signalling social receptivity, although the gesture's status as a universal is argued (Ekman, 1979).

In general, the behavioral correlates of lowered-brow expressions suggest social dominance and submissiveness or receptivity seems to underlie the behaviors accompanied by brow raising. There are some noteworthy exceptions to the pattern of findings supporting these generalizations (Camras, 1982; Zivin, 1982), but most of the evidence targets brow position as a potential universal dominance cue in humans.

Mouth Gestures

Another potential human dominance cue involves expression of the mouth. A mouth grimace called the "silent bared-teeth" display or "grin-face" (van Hooff,

1967) has been identified as a submissive gesture among many primates, including those most closely related to humans (for a review see van Hooff, 1972; Redican, 1975). The grimace may have evolved as a submissive signal through its association with the expulsion of dangerous material from the mouth (Andrew, 1963b). In some species, the grimace appears to signal reassurance of affability, often in the context of greeting. The affiliative role of the grimace is especially evident among *Pan troglodytes* (the chimpanzee), members of the genus closest to *Homo* (van Hooff, 1972). In fact, van Hooff (1972) has argued that the homologue to the human smile is the primate submissive grimace.

Smiling clearly plays an affiliative role during human interactions. Smiling in response to social stimuli (e.g., human faces, voices) begins early in infancy (e.g., Ambrose, 1961; Spitz & Wolf, 1946; Wolff, 1963) even among deaf-and-blind infants (e.g., Eibl-Eibesfeldt, 1975). Smiling faces are particularly effective in inducing infant smiling by 3 or 4 months of age (Ambrose, 1961). Among adults, smiles are more likely to occur in social than nonsocial contexts (Kraut & Johnston, 1979). Smiles are associated with positive feedback during conversation (Brunner, 1979) and with greeting in Western (e.g., Lockard, Fahrenbruch, Smith, & Morgan, 1977) and non-Western cultures (Eibl-Eibesfeldt, 1972). The function of smiling during human greeting resembles that of nonhuman primate grimaces during initial approach (van Hooff, 1972).

Does human smiling assume an element of appeasement or submission, as the nonhuman primate record suggests? There is some indication that it does. Human greeting, for instance, may comprise shades of risk and deference, as greeting seems to among other primates (van Lawick-Goodall, 1968). This may explain why low-ranking children in a group peck-order smiled more when approaching high-ranking children than high rankers did when approaching low rankers (Krebs, 1972). The observation that the Japanese smile in reaction to reprimand by a superior (Klineberg, 1938) also suggests appeasement. In the United States, smiling is associated with approval seeking (Rosenfeld, 1966) and low social status (Miller, Dovidio, & Keating, 1984) in adults and with low peer "toughness" ratings in children (Freedman, 1979).

In sum, observations from a variety of cultures indicate that smiling plays an affiliative role during human interaction as the grimace seems to among some nonhuman primates. Whether human smiling also serves as a social deference gesture, like its nonhuman counterpart does, warrants further study.

Whether deferential or assertive in quality, both brow and mouth gestures overlap with components of universally recognized emotional expressions. For example, lowered brows have been associated with anger, raised brows with fear or surprise, and smiles with happiness or joy (e.g., Boucher & Carlson, 1980; Ekman & Friesen, 1971; Ekman, Sorenson, & Friesen, 1969; Izard, 1971; cf., Kilbride & Yarczower, 1980). Should it be said, then, that lowered brows are associated with social dominance or with "anger"? Although some observers interpret dominance displays as emotional in nature, others warn against imputing single, underlying motivational states from observed behaviors (Andrew, 1972; Hinde, 1959). The research presented next investigates facial gestures without presuming underlying emotional correlates. Here, the concept of social dominance is invoked, and the emphasis is on its communication (see Chapter 1 for a discussion of the concept of dominance).

Cross-Cultural Tests of Brow and Mouth Dominance Gestures

The cross-species-cross-cultural research approach suggested that brow and mouth positions served as status cues for various nonhuman primate species and corresponded to a few status-related behaviors among some human groups. Would cross-cultural experiments reveal universal social perceptions of these brow and mouth cues when portrayed by human models? A cross-cultural study was conducted to test whether lowered-brows made human faces appear more dominant than raised-brows did and whether smiling made faces appear relatively submissive. If it were consistent with the nonhuman primate record, the discovery of universal dominance signals would suggest their homologous origins.

The stimuli created for cross-cultural tests of the proposed dominance expressions comprised black-and-white portrait photographs of humans posing the primate brow and mouth gestures (see Keating et al., 1981a for details). Each photographic model posed two contrasting expressions. Some posed with brows lowered and raised, and others posed with mouths relaxed and slightly smiling.

The two photographed poses for each model were separated into two different stimulus series. Within both series, each portrait was paired with another in which the counterpart brow or mouth pose was displayed by a different model. The observer's task therefore became a two-choice procedure that was readily communicable across cultures. Observers were simply asked (in their native language) to choose the more dominant-looking individual from each portrait pair. A brief description of "dominance" was given: "A dominant person usually tells other people what to do and is usually respected. A dominant person seldom submits to others" (Keating et al., 1981a, p. 618). Observers viewed a total of 19 portrait pairs presenting models from either Caucasian, African, or Asian ethnic backgrounds. Representative stimuli are depicted in Figure 5-1.

Data from 11 national-cultural samples were analyzed. There were two United States samples (from New York and Texas), three from Europe (one from Germany and two from the Canary Islands, Spain), two South American samples (from Brazil and Colombia), two African samples (Kenyan and Zambian), and one sample from Thailand. A group of Chinese students and their relatives living in New York also participated as observers.

Statistical procedures compared the judgments of observers who viewed different poses of the *same* (rather than different) models so that the facial idiosyncrasies of individual models would not alter the effects of the gestures. Figure 5-2 depicts the results of these analyses for mouth gestures. For 10 of the 11 national-cultural samples, models' nonsmiling poses were selected as dominant-looking more often than their smiling poses ($p \leq .10$). Only the results for the Kenyan sample failed to show a significant trend in this direction. Neither models' ethnic background nor observers' gender had any determinable impact on the effect of mouth position.

The results for brow gestures were unexpectedly variable (Figure 5-3). Models were more often perceived as dominant when posed with lowered rather than raised brows but only among the more Westernized groups (i.e., those samples collected in the United States or Europe) and in Brazil (all $p \leq .002$). Thai observers chose models' raised-brow poses as dominant ($p < .05$). Brow pose did not significantly affect the dominance judgments of observers from Colombia, Kenya, or Zambia,

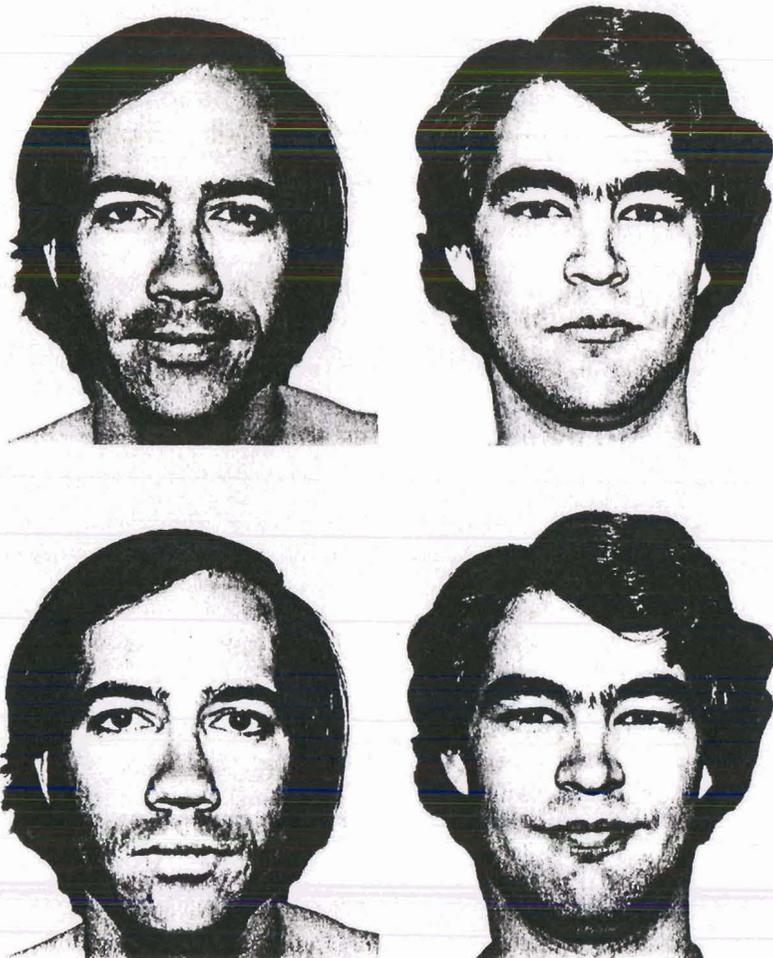


Figure 5-1. Representative examples of face pairs depicting mouth gestures. Subjects viewed either the top or bottom pair. Adapted with permission from the American Psychological Association.

and there were no determinable influences of models' ethnic background or observers' gender.

Thus, the findings for brow and mouth dominance gestures diverged. The influence of brow position varied across cultures, while the influence of mouth position was nearly universal. When judging dominance, observers reliably avoided smiling poses in favor of nonsmiling ones. Could the nonsmiling–dominance association have been universally learned? Possibly, but in the absence of compelling arguments

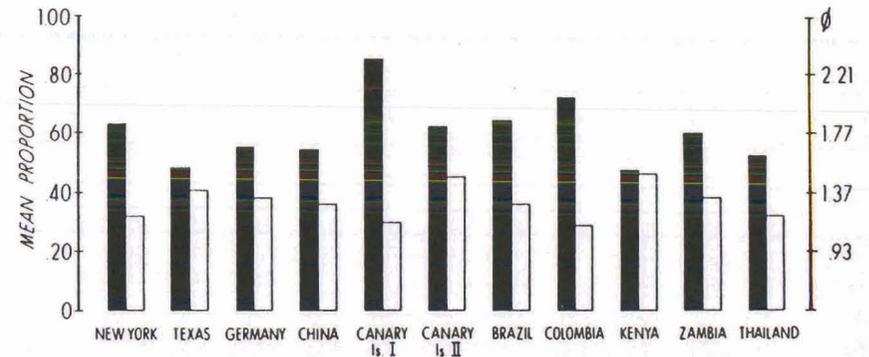


Figure 5-2. Mean proportion of models' smiling and nonsmiling poses chosen by observers as dominant. Solid bars indicate nonsmiling poses; open bars indicate smiling poses. Reprinted with permission from the American Psychological Association.

describing some universal experience that might account for the association, a learning explanation seems improbable. More likely, the fact that smiles had a common impact on the dominance attributions of observers from culturally distinct groups indicates underlying genetic constraints consistent with van Hooff's (1972) propositions concerning the evolution of the smile.

The results for brow poses are more difficult to interpret than those for mouth poses. The predicted lowered-brow dominance cue was generally restricted to the most Westernized samples, where it was highly effective in altering dominance perceptions. It may be that the proposed brow cues are peculiar to Western culture and have no phyletic basis. Oddly enough, however, these same human portrayals of brow dominance gestures were reacted to as such when the observers were rhesus monkeys! Recordings of monkey eye movements suggested that animals submissively avoided the "gazes" of lowered-brow portraits more than they did those of raised-brow portraits (Keating & Keating, 1982).

Perhaps socialization practices in non-Western cultures modified the attributions observers made in response to brow gestures. For instance, in some oriental cultures, brow movements are considered impolite and are discouraged. Such differences in cultural "display rules" (Ekman, Friesen, & Ellsworth, 1972) may modify the interpretation of gestures. Whether culture does alter the meaning of brow cues could be detected by cross-cultural comparisons of intracultural developmental trends in the decoding of facial expressions. If young children's perceptions of brow cues were predictably similar *across* cultures but differed from those of older children and adults *within* cultures, then enculturative influences could be seen as overriding genetically based perceptual biases. In addition, the discovery of developmental consistency in the perception of mouth gestures would lend support to arguments favoring a genetic basis to the message of submission conveyed by smiling. An understanding of facial dominance cues therefore requires comparisons of developmental investigations conducted within as well as across cultures. Intracultural developmental studies of the brow and mouth gestures have begun in the United States.

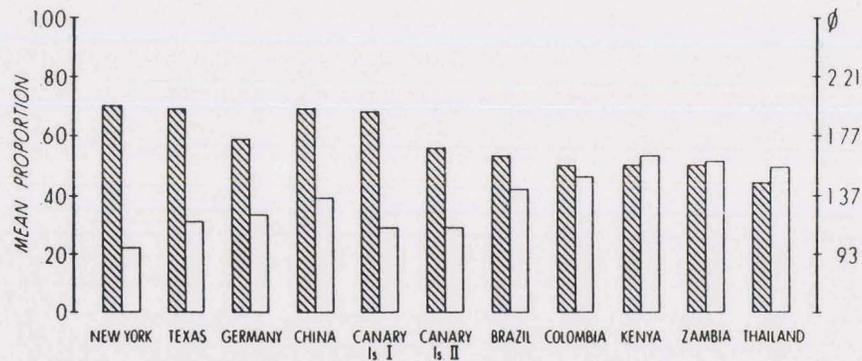


Figure 5-3. Mean proportion of models' lowered- and raised-brow poses chosen by observers as dominant. Shaded bars indicate lowered-brow poses; open bars indicate raised-brow poses. Reprinted with permission from the American Psychological Association.

Children's Decoding of Dominance Gestures

In the United States children's responses to brow and mouth cues were recorded in order to check for intracultural consistency in the interpretations of these gestures across different age groups (Keating & Bai, 1984). This research employed a subset of the stimuli used in the cross-cultural study by Keating et al. (1981a). Children between the ages of 4 and 7 viewed 12 of the original portrait pairs (six contrasting brow poses and six contrasting mouth poses) while listening to one of several dominance vignettes. The vignettes described dominance situations similar to the three examples given below:

Look at these two people. They are going on a trip together. Which person looks like the leader of the trip and tells the other person what to do?

Look at these two people. They want to play a game together. Which person will say what the rules for the game are?

Look at these two people. They want to watch TV, but they like different TV shows. So they begin to argue and fight about what to watch on TV. Who looks tougher and fights about it the hardest?

For the children, then, "dominance" was associated with telling others what to do, with leadership, toughness, and with assertive behavior.

Fifty-one girls and boys comprising two different age groups (4-5 years and 6-7 years of age) responded to the stories by choosing the more dominant-looking face from each portrait pair. As for adults in the cross-cultural study, the selections of children viewing models' lowered brow or nonsmiling poses were compared with those of children who viewed the raised-brow or smiling poses of the same set of models. The children's responses are depicted in Figures 5-4 and 5-5.

The results for American children paralleled those for Western adults. Children chose nonsmiling and lowered-brow poses as dominant-looking significantly more

PERCENTAGE OF MODELS CHOSEN AS DOMINANT

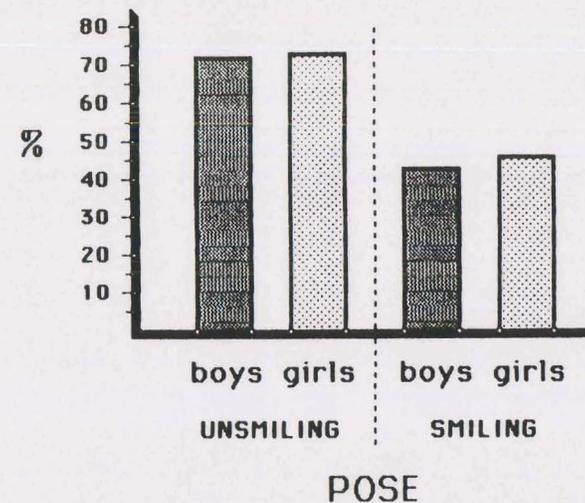


Figure 5-4. Percentage of models' smiling and unsmiling poses chosen as dominant by girls and boys.

often than they chose the counterpart pose ($p < .05$). Girls and boys chose similarly, as did children from both age groups. Thus, it appears that brow and mouth dominance gestures are operable in American children at least as young as 4 years of age.

How children in other countries would interpret brow and mouth gestures remains to be investigated. Perhaps the perceptions of children from Zambia, Kenya, and Thailand would be consistent with those of American children and thus discrepant with the perceptions of adults from the societies in which they were raised. If so, this result would suggest that enculturative processes overwhelmed the "natural" manifestation of gestural interpretations by adulthood in these countries, at least for brow expressions. Presently, however, the cross-cultural and developmental evidence support a phylogenetic basis for mouth dominance gestures alone.

The conclusions drawn from the facial gestures studies have been based on experimental procedures that controlled for differences in facial morphology. That is, the results indicated that, given a *particular* individual's face, if that individual assumed a smile or a raised-brow pose, they appeared less dominant than if they did not smile or, when in the West, assumed a lowered-brow expression. But the data also showed that, without controlling for facial morphology, the impact of gestures was compromised by physiognomic differences among the portrait models. It seemed that physiognomic cues as well as facial expressions were capable of sending status messages, and this possibility was introduced as a second theme in the research on human dominance communication.

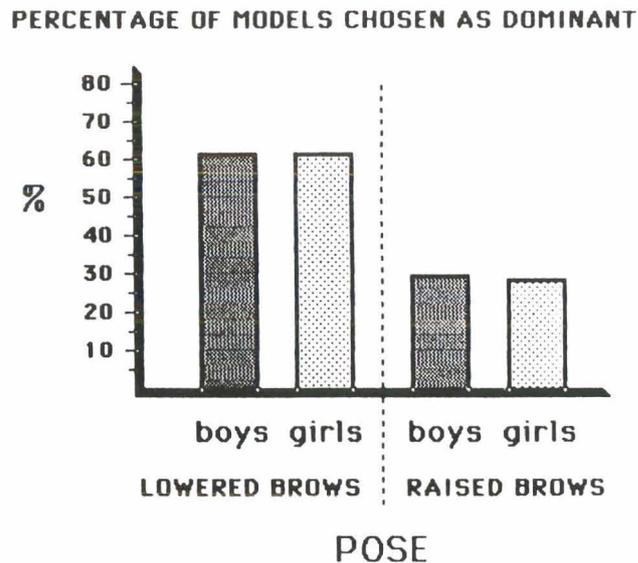


Figure 5-5. Percentage of models' lowered- and raised-brow poses chosen as dominant by girls and boys.

The Impact of Physiognomy on Perceptions of Dominance and Submissiveness

Facial expressions are not the only medium through which animals communicate dominance and submissiveness. Among many species, morphological characteristics convey social dominance. For example, plumage coloration in Harris sparrows (Rohwer & Rohwer, 1978), horn-size in mountain sheep (Geist, 1971), and greying in the mountain gorilla (Schaller, 1963) correspond to the social dominance enjoyed by individual members of these species. The cross-species record suggests that some morphological traits evolved to signal the social dominance that normally emerges with sexual maturity and age. Such traits herald likely success during intra-specific competitions.

Some ethologists have proposed that morphological traits function as social dominance or nondominance cues among humans (Eibl-Eibesfeldt, 1975; Guthrie, 1970; Lorenz, 1943; Wickler, 1967). If so, perhaps human morphological traits associated with physical maturity acquired a communicative function for social dominance in a fashion analogous to that of other species (Keating, Mazur, & Segall, 1981b; Keating, 1985). For example, square jaws may make individuals appear dominant because such a jaw structure reflects the mature dentition used for intimidation among many species, including humans (Guthrie, 1970).

Features resembling characteristics of immaturity or babyhood may be just as effective in altering dominance perceptions by making adult individuals appear helpless and nonthreatening (Keating, 1985; Keating et al., 1981b). Lorenz (1943)

identified several infantile features (e.g., relatively large heads and eyes; rounded jaws and foreheads) peculiar to the young from diverse species. Lorenz argued that such infantile characteristics evolved because they successfully elicited care-taking and cooperative responses from adult individuals. When portrayed by adults, might these infantile characteristics result in appearances of nonthreat and subordination? Evidence of cross-cultural consistency in attributions of dominance to physiognomic traits corresponding to physical maturity and strength rather than immaturity and helplessness would suggest a human analogue to the morphological signalling systems found among other species.

Cross-Cultural Tests of Physiognomic Dominance Cues

Analyses of data collected for the facial gestures study provided evidence of cross-cultural consistency in dominance perceptions produced by physiognomic characteristics, as well (see Keating et al., 1981b for details). When the original data were reanalyzed so as to control for the influence of facial gestures, some cross-cultural patterns of dominance choices persisted. Regardless of gestures, models from eight of the 19 face pairs were selected as dominant-looking by a majority of observers from at least 10 of the 11 national-cultural samples (all $p < .02$).

The physiognomic traits of models producing significant, cross-cultural agreement in dominance perceptions were examined. The selection of traits that were analyzed was guided by Guthrie's (1970) speculations on human dominance signalling. Portrait pair mates were compared for relative jaw size, hairline, eyebrow thickness, lip thickness, ear prominence, eye color, and facial width. Pair mates frequently differed from one another on more than one of these traits. This made it impossible to decipher the independent contribution of each trait to dominance perceptions. However, certain traits were repeatedly (though not infallibly) associated with a dominant appearance. In particular, traits associated with age (receded hairline and thin lips) and with physical strength (broad faces and square jaws) corresponded to pancultural perceptions of dominance.

Thus the cross-cultural evidence provided tentative support for a human analogue to the morphological message systems conveying dominance in other species. But are humans genetically primed to associate certain physiognomic traits with dominance or nondominance? Or have adult attributions been shaped by the universal association between social status, maturity, and seniority that accompanies the age-graded dominance systems characterizing human societies (van den Berghe, 1980)? Cross-cultural studies of developmental trends in perceiving dominance from physiognomy would assuage arguments for or against the learning hypothesis. If the dominance perceptions of very young children are discrepant with those of adults from their culture, then it is likely that responses to physiognomic cues are encultured by adulthood. If children's social perceptions consistently correspond with those found universally for adults, then a genetic predisposition to associate certain physiognomic cues with dominance may be proposed.

To test for developmental consistency, Keating and Bai (1984) examined the responses of American children to a subset of the portrait stimuli used in the cross-cultural study of adult perceptions of physiognomic cues. The children viewed only

four of the eight face pairs that generated consistent, cross-cultural dominance perceptions. However, the children's mean dominance selections agreed with the biases of the adults in all four cases and produced a statistically significant result for three of these four face pairs. The children showed no significant choice biases for eight other face pairs (Table 5-1), and neither had adults in the cross-cultural study. Data from children in other cultures are needed to complete the picture.

Unfortunately, the portrait stimuli could generate only limited information about physiognomic cues. The proposed dominance characteristics were not optimally portrayed, because no attempt was made to sample particular traits when the photographs were taken. Because faces were shown in pairs, it was unclear which pair mate was primarily responsible for cross-cultural consistency in dominance perceptions. In addition, the value of the realism achieved by using portrait photographs of real faces was compromised by the lack of control over numerous, unassessed facial elements that may have influenced social perceptions. To resolve these problems, research on physiognomic dominance cues has continued by employing a new set of stimuli generated from the Smith and Wesson Identi-Kit Model II. (Identi-Kits are typically used by police agencies to construct facial composites of suspected criminals.) Identi-Kit materials permit faces to be assembled from transparent overlays on which different facial features are printed (eyes, nose, lips, jaw, hairstyle, etc.). Faces may be altered by single or multiple features and are impressively life-like in appearance. Reported next are findings from an Identi-Kit study of physiognomic dominance cues conducted in the United States.

An Identi-Kit Study of Physiognomic Dominance Cues

Faces constructed from Identi-Kit materials were used to investigate specific physiognomic traits predicted to alter human perceptions of dominance and non-dominance (Keating, 1985). Following the cross-species record, human physiognomic dominance cues were expected to include traits associated with successful,

Table 5-1 The Percentage of Children Choosing, as Dominant Looking, the Face on the Left of Portrait Pairs

Predicted Choice ^a	Left Choices (%)	Z	p (Two-Tailed)
Right	19.90	-4.30	.001
Left	56.60	0.93	NS
Right	34.70	-2.19	.050
Left	71.55	3.08	.001
None	36.40	1.94	NS
None	46.30	0.53	NS
None	57.65	1.09	NS
None	61.55	1.65	NS
None	40.50	1.36	NS
None	49.75	0.04	NS
None	40.05	1.42	NS
None	53.25	0.46	NS

NS, not significant.

^a Predictions were based on the cross-cultural choice patterns of adult subjects.

intraspecific competition such as age and sexual maturity. Identi-Kit faces with prominent, square jaws (indicative of mature dentition) were hypothesized to appear more dominant than those with more rounded ones. Because facial hair develops following puberty, faces with bushy or thick eyebrows were predicted to appear dominant relative to those with thin eyebrows (Guthrie, 1970). Small eyes were expected to look more dominant relative to the large eyes characteristic of prepubescence (Lorenz, 1943). Thick, pudgy lips, associated with babyhood, were predicted to diminish the dominance ratings of faces when contrasted with those portraying thin lips.

Using the Identi-Kit materials, four different "base" faces were created. Each face was characterized by a unique nose and hairstyle. Two kinds of feature manipulations were photographed for each face. Multiple-feature facial variations simultaneously portrayed the four features predicted to look dominant (i.e., thick brows, small eyes, thin lips, and a square jaw) and those predicted to look nondominant (i.e., thin brows, large eyes, thick lips, and round jaw). The second type of feature manipulation varied only one feature at a time (brows or eyes or lips or jaw) in either its mature or juvenile form. Features of average size or shape were temporarily substituted for the three nonmanipulated features. For example, each of the four faces was photographed first with the average-grade brows, lips, and jaw plus very small eyes, then with the same average-grade features plus very large eyes. This procedure was followed for the single-feature manipulations of brows, lips, and jaw. Additionally, in order to create female stimulus faces, each of the four base faces, across all its manipulations, was photographed with a unique female hairstyle. The only difference between male and female faces was hairstyle.

Faces were shown singly on photographic slides. Undergraduate subjects were asked to rate each face on scales for dominance (1, indicating very submissive and 7, very dominant). Representative stimuli appear in Figure 5-6.

Dominance ratings for both male and female faces were significantly higher when all four mature traits were displayed ($M = 5.28$) in contrast to all four immature traits ($M = 3.22$). When traits were altered one at a time, variations in eye size or lip thickness alone were reliable dominance cues across male and female faces. Brow and jaw cues, however, were not. In fact, a significant "maturity" effect generalized across all four feature manipulations for male but not for female faces. Only when all four mature features were displayed simultaneously did dominance ratings increase significantly for females. Perhaps maturing female faces are better indicated by features other than those manipulated here. Thus, although the distinction between juvenile and mature facial characteristics successfully predicted impressions of social dominance for male faces, it met with only partial success for female faces.

Physiognomic cues providing information about social dominance and non-dominance were also predicted to convey impressions of physical attractiveness—but in different ways for males and females. The cross-species pattern suggested that attractive male morphologies would likely be associated with the physique promoting successful competition. Therefore, dominance cues should also appear attractive on males. Females in animal societies, however, frequently acquire access to resources indirectly through the social manipulation of dominant males (Chapter 4).

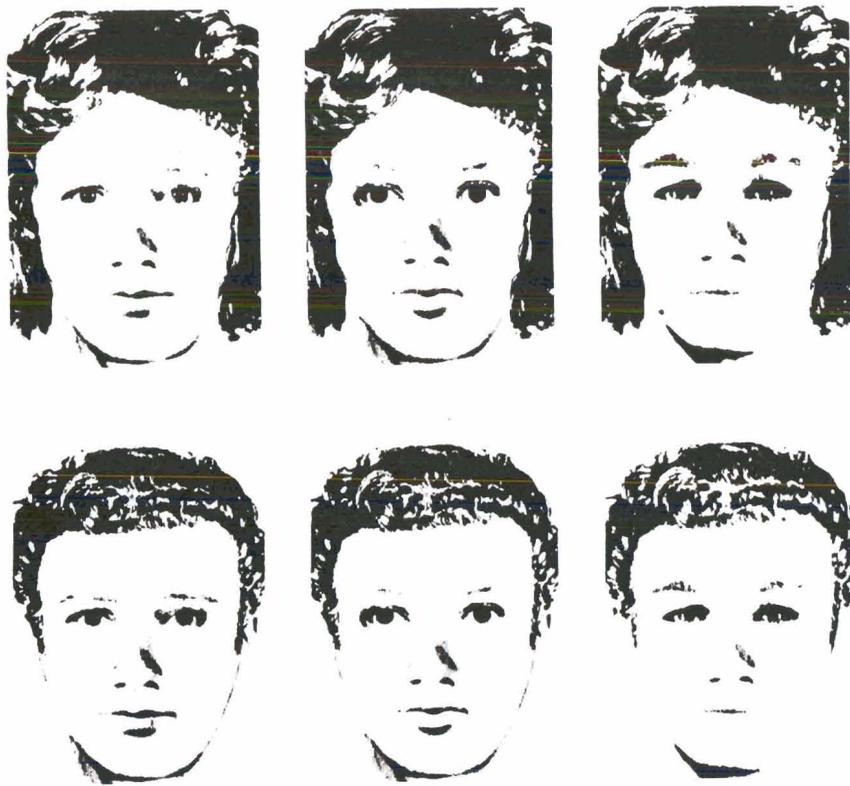


Figure 5-6. Representative examples of the Identi-Kit stimuli. Female faces appear on top, males on the bottom. From left to right: all average, immature, and mature features. Reprinted with permission from the American Sociological Association.

If childlike characteristics generally elicit care-taking and cooperative responses, adult female mimicry of such traits might facilitate cooperation and stem male aggressive-competitive responses (Eibl-Eibesfeldt, 1975). Thus, immature characteristics that serve as cues for *nondominance* were predicted to make females appear more attractive.

When subjects judged the Identi-Kit faces for attractiveness, male faces with all four mature features displayed at once were rated as significantly more attractive than those with immature traits. Thus, as predicted, traits designed to look dominant also looked attractive on males. Although the simultaneous manipulation of all four nondominant traits failed to raise female attractiveness ratings, some support for the hypothesis linking female attractiveness to nondominant cues was found. Across all single-feature manipulations, female faces with nondominant features generated significantly higher attractiveness ratings ($M = 3.76$) than those with dominant ($M = 3.5$) features ($p < .05$). Male faces were rated as significantly more attractive when displaying dominant ($M = 4.2$) rather than nondominant ($M = 3.82$)

features ($p < .005$). In general, then, traits that served as reliable dominance cues (at least for male faces) made males look more attractive and females less so. Female faces were perceived as attractive when displaying traits that made male faces appear submissive.

The anticipated effects of maturity on both dominance and attractiveness judgments diverged somewhat for brows, eyes, lips, and jaw so that support for the hypotheses was considered partial. Variations in eye size produced the clearest results and supported predictions. Specifically, large eyes made faces look submissive relative to small eyes for both male and female stimuli. Large eyes also made female but not male faces look more attractive. These findings suggest that impressions of physical attractiveness may be shaped, in part, by physiognomic cues that transmit information about social dominance and nondominance (Givens, 1978).

Taken as a whole, the research on physiognomic dominance cues suggests two patterns of human dominance communication that spring from the cross-species design. First, dominance in human adults is conveyed by morphological traits associated with adult development. Nondominance is signalled by physiognomic aspects of the prepubescent young of our species. These results appear consistent with recent data from a similar study by McArthur and Apatow (1984). However, there is only tentative evidence that the pattern is pancultural (i.e., Keating et al., 1981b), and cross-cultural studies using the Identi-Kit stimuli are needed to confirm this possibility. Future studies should also determine why the brow, eye, lip, and jaw cues examined in the Identi-Kit study were more successful in altering the dominance perceptions of male rather than female faces.

The second pattern that emerges from research on physiognomic cues links dominance attributions to attractiveness. The premise that dominance and attractiveness relate differently for male and female faces implies that our initial impressions of others fuse attractiveness with gender expectations for social dominance. Females portraying nondominant facial characteristics may strike us as attractive or appropriately “feminine” because their appearance is consistent with our stereotypic expectations about social status differences between males and females. Hollywood provided us with a caricaturization of this phenomenon in the film, *Tootsie*. In that film an unemployed male actor, desperate for an income, auditions for a female role in a soap opera. The opening scene reveals the makeup preparations he uses to change his masculine features into attractively feminine ones and to become *Tootsie*. Brows are thinned, eyes are painted to look larger, lips are colored to look fuller, and cheekbones are highlighted to give the lower half of the face a rounder look. Each step contributes to the “feminization” of the face and is roughly consistent with the findings from the physiognomy research: Nondominant or babylike features are attractive on female but not male faces—a sort of “Tootsie Effect.” Attractive male physiognomies are those that look dominant.¹

¹The techniques used by professional makeup artists are consonant with results from the Identi-Kit study. Interviews with makeup artists working for modeling agencies confirm that large eyes are highly valued in female but not male models. Between 70%–80% of an artist’s time is spent using shading and lining procedures to make women’s eyes look larger. In addition, eyebrows are thinned and arched on female models except for the few desiring the

General Conclusions

The cross-species–cross-cultural approach reveals that, as for other species, human dominance messages may be gestural or physiognomic. The different characters of these two message systems have a bearing on the nature of dominance relationships. Each individual in a dispute has the ability to display the gestures that mediate dominance relationships, but the physiognomic cues conveying status are relatively stable. Thus, gestural communication systems may help maintain the surprisingly opportunistic nature of primate dominance relationships (Bernstein & Gorden, 1980), while morphological signalling systems place limits on this opportunism and partly explain the regularity with which maturity and gender predict dominance rankings in human and animal societies.

The kinds of signalling systems identified by the cross-species–cross-cultural approach implicate both behavioral homologies and analogies. The panculturally perceived nondominance of the smile appears likely to be imposed by the genetic constraints humans share with other primates and thus supports van Hooff's (1972) arguments for the smile's homologous beginnings. The cross-cultural variability in the perceptions of brow cues is not consistent with expectations of homologous origins. Finally, the morphological signalling system for communicating dominance in humans appears analogous to that of other species.

These conclusions about human dominance communication drawn from cross-species–cross-cultural analyses involve some controversial inferences. For example, whether present-day primate behavior represents that of phyletic ancestors or reflects more recently evolved responses to particular environmental niches is problematic when cross-species patterns are sought (Napier & Napier, 1967). Cross-cultural tests involve inferences, too. Tests revealing culturally variable responses rather than cross-cultural consistency have often been the basis for refuting genetic influences on observed behavior. But "genetic" is not synonymous with "fixed." Given human behavioral plasticity, many nonuniversal behavioral traits may reflect culture-specific learning that conceals common genetic foundations. Even the interpretation of behavioral universals is sometimes equivocal (Lonner, 1981). Cross-cultural universals may imply genetic constraints on observed behavior, but universal learning is also possible, especially where identifiable, pancultural experiences offer plausible explanations for behavioral consistencies.

The strength of the cross-species–cross-cultural approach is that it does not rely on any single result but on patterns of findings across cultures and species. Thus, it restricts the conditions under which inferences can be made. Where common behaviors are identified among nonhuman primate species and among diverse human cultures, behavioral homologies may be inferred. Behavioral analogues are implied where species from divergent evolutionary lineage reveal behavioral traits

natural brow, "Brooke Shields–Margaux Hemingway" look that the artists claimed looked poorly on most women and was just a fad. On male faces, the brows are evened, if anything, but never thinned or arched. Color is applied to women's lips to give them a fuller look. Cheekbone highlights are used to diminish square jaws in women, whereas square jaws are valued in men (Ellyson, personal communication, 1984).

alike in form and function. Similar arguments have been formalized into research paradigms by other researchers (e.g., Alexander & Tinkle, 1981; Lockard, 1980; Rajecki & Flanery, 1981).

So it seems that humans, like other species, have built-in biases to perceive certain gestures and physiognomies as social dominance messages. The consequences of these biases in social perception are impressive. For example, Mazur, Mazur, and Keating (1984) found that air force cadets judged by college students to have dominant-looking faces actually achieved higher ranks by their senior year at West Point than less dominant-looking cadets did. The correlation between facial dominance ratings and senior year rank was .54 ($p < .001$). Presumably, the evaluations of cadets by the officers who trained them were affected by the cadets' physical appearances and especially their physiognomies.

Social psychological theories of person perception should take into account the nonverbal cues that lead us to expect certain types of behavior from the individuals we meet (McArthur & Baron, 1983). From a cross-species, cross-cultural perspective, the human biases in social perceptions that are generated from physiognomic and gestural cues emerge not as arbitrary, cultural conventions, but appear consistent with a larger scheme—the evolution of primate communication.

Acknowledgments. This chapter benefited from the helpful suggestions of the volume editors; from research assistants Jeff Mann, Diane Munzer, and Mark Sibicky; and from funds provided by the Colgate University Research Council and the Carter-Wallace Foundation.

References

- Alexander, R. D., & Tinkle, D. W. (Eds.). (1981). *Natural selection and social behavior*. New York: Chiron.
- Ambrose, J. A. (1961). The development of the smiling response in early infancy. In B. M. Foss (Ed.), *Determinants of infant behavior* (Vol. 1, pp. 179–196).
- Andrew, R. J. (1963a). The origin and evolution of the calls and facial expressions of the primates. *Behavior*, 20, 1–109.
- Andrew, R. J. (1963b). Evolution of facial expression. *Science*, 142, 1034–1041.
- Andrew, R. J. (1972). The information potentially available in mammal displays. In R. A. Hinde (Ed.), *Nonverbal communication* (pp. 179–203). Cambridge: Cambridge University Press.
- Bernstein, I. S., & Gorden, T. P. (1980). The social component of dominance relationships in rhesus monkeys (*Macaca mulatta*). *Animal Behaviour*, 28, 1033–1039.
- Birdwhistell, R. (1968). Kinesics. In *international encyclopedia of the social sciences* (Vol. 8, pp. 379–385). New York: Macmillan.
- Blurton Jones, N. G. (1971). Criteria used in describing facial expressions in children. *Human Biology*, 43, 365–413.
- Bolwig, N. (1964). Facial expressions in primates with remarks on a parallel development in certain carnivores (a preliminary report on work in progress). *Behavior*, 22, 167–192.
- Boucher, J. D., & Carlson, C. E. (1980). Recognition of facial expression in three cultures. *Journal of Cross-Cultural Psychology*, 11, 263–280.
- Brannigan, C. R., & Humphries, D. A. (1972). Human non-verbal behavior, a means of communication. In N. Blurton Jones, *Ethological studies of child behavior*. Cambridge: Cambridge University Press, 37–64.
- Bruner, L. J. (1979). Smiles can be back channels. *Journal of Personality and Social Psychology*, 37, 728–734.

- Camras, L. A. (1977). Facial expressions used by children in a conflict situation. *Child Development*, 48, 1431-1435.
- Camras, L. A. (1982). Ethological approaches to nonverbal communication. In R. S. Feldman (Ed.), *Development of nonverbal behavior in children* (pp. 3-28). New York: Springer-Verlag.
- Darwin, C. (1965). The expression of the emotions in man and animals. (Original work published 1872). Chicago: University of Chicago Press.
- Dixon, A. F. (1977). Observations on the displays, menstrual cycles and sexual behavior of the "Black ape" of Celebes (*Macaca nigra*). *Journal of Zoology (London)*, 182, 63-84.
- Eibl-Eibesfeldt, I. (1972). Similarities and differences between cultures in expressive movements. In R. Hinde (Ed.), *Nonverbal communication* (pp. 297-312). New York: Cambridge University Press.
- Eibl-Eibesfeldt, I. (1975). *Ethology: The biology of behavior* (2nd ed.). New York: Holt, Rinehart & Winston.
- Ekman, P. (1972). Universals and cultural differences in facial expression of emotion. In J. Cole (Ed.), *Nebraska symposium on motivation* (pp. 207-283). Lincoln: University of Nebraska Press.
- Ekman, P. (1979). About brows: Emotional and conversational signals. In M. von Cranach, K. Foppa, W. Lepenies, & D. Ploog (Eds.), *Human ecology*. London: Cambridge University Press.
- Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology*, 17, 124-129.
- Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). *Emotion in the human face: Guidelines for research and an integration of findings*. New York: Pergamon.
- Ekman, P., Sorenson, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. *Science*, 164, 86-88.
- Freedman, D. G. (1979). *Human sociobiology: A holistic approach*. New York: Free Press.
- Geist, V. (1971). *Mountain sheep: A study in behavior and evolution*. Chicago: University of Chicago Press.
- Givens, D. B. (1978). The nonverbal basis of attraction: Flirtation, courtship, and seduction. *Psychiatry*, 41, 346-359.
- Grant, E. C. (1969). Human facial expression. *Man*, 4, 525-536.
- Gregory, W. K. (1965). *Our face from fish to man*. New York: Capricorn. (Original work published 1929)
- Guthrie, R. D. (1970). Evolution of human threat display organs. *Evolutionary Biology*, 4, 257-302.
- Hewes, G. W. (1973). Primate communication and the gestural origin of language. *Current Anthropology*, 14, 5-24.
- Hinde, R. A. (1959). Unitary drives. *Animal Behavior*, 7, 130-141.
- Hinde, R. A., & Rowell, T. E. (1962). Communication by postures and facial expressions in rhesus monkey (*Macaca mulatta*). *Proceedings of the Zoological Society of London*, 138, 1-21.
- Huber, E. (1930a). Evolution of facial musculature and cutaneous field of trigeminus. I. *Quarterly Review of Biology*, 5, 133-188.
- Huber, E. (1930b). Evolution of facial musculature and cutaneous field of trigeminus. II. *Quarterly Review of Biology*, 5, 389-437.
- Izard, C. E. (1971). *The face of emotion*. New York: Appleton-Century-Crofts.
- Jolly, A. (1972). *The evolution of primate behavior*. New York: Macmillan.
- Keating, C. F. (1985). Gender and the physiognomy of dominance and attractiveness. *Social Psychology Quarterly*, 48, 61-70.
- Keating, C. F., & Bai, D. L. (1984). *Children's attributions of social dominance from facial cues*. Unpublished manuscript, Colgate University.
- Keating, C. F., & Keating, E. G. (1982). Visual scan patterns of rhesus monkeys viewing faces. *Perception*, 11, 211-219.

- Keating, C. F., Mazur, A., Segall, M. H., Cysneiros, P. G., Divale, W. T., Kilbride, J. E., Komin, S., Leahy, P., Thurman, B., & Wirsing, R. (1981a). Culture and the perception of social dominance from facial expression. *Journal of Personality and Social Psychology*, 40, 615-626.
- Keating, C. F., Mazur, A., & Segall, M. H. (1981b). A cross-cultural exploration of physiognomic traits of dominance and happiness. *Ethology and Sociobiology*, 2, 41-48.
- Kilbride, J. E., & Yarczower, M. (1980). Recognition and imitation of facial expressions: A cross-cultural comparison between Zambia and the U.S. *Journal of Cross-Cultural Psychology*, 11, 281-296.
- Klineberg, O. (1938). Emotional expression in Chinese literature. *Journal of Abnormal and Social Psychology*, 33, 517-520.
- Kraut, R. E., & Johnston, R. E. (1979). Social and emotional messages of smiling: An ethological approach. *Journal of Personality and Social Psychology*, 37, 1539-1553.
- Krebs, K. (1972). *An observational study of dominance behavior in young children*. Unpublished doctoral dissertation, Oxford University, England.
- Leventhal, H., & Sharp, E. (1965). Facial expressions as indicators of distress. In S. S. Tomkins & C. E. Izard (Eds.), *Affect, cognition and personality* (pp. 296-318). New York: Springer.
- Lockard, J. S. (Ed.). (1980). *The evolution of human social behavior*. New York: Elsevier.
- Lockard, J. S., Fahrenbruch, C. E., Smith, J. L., & Morgan, C. J. (1977). Smiling and laughter: Different phyletic origins? *Bulletin of the Psychonomic Society*, 10, 183-186.
- Lonner, W. J. (1981). The search for psychological universals. In H. C. Triandis & W. W. Lambert (Eds.), *Handbook of cross-cultural psychology: Perspectives* (pp. 143-204). Boston: Allyn & Bacon.
- Lorenz, K. (1943). Die angeborenen Formen möglicher Erfahrung. *Zeitschrift für Tierpsychologie*, 5, 235-409.
- Mayr, E. (1976). *Evolution and the diversity of life*. Cambridge, MA: Belknap.
- Mazur, A. (1973). A cross-species comparison of status in small established groups. *American Sociological Review*, 38, 513-530.
- Mazur, A., Mazur, J., & Keating, C. F. (1984). Military rank attainment of a West Point class: Effects of cadets' physical features. *American Journal of Sociology*, 90, 125-150.
- Mazur, A., Rosa, E., Faupel, M., Heller, J., Leen, R., & Thurman, B. (1980). Physiological aspects of communication via mutual gaze. *American Journal of Sociology*, 86, 50-74.
- McArthur, L. A., & Apatow, K. (1984). Impressions of baby-faced adults. *Social Cognition*, 2, 315-342.
- McArthur, L. Z., & Baron, R. M. (1983). Toward an ecological theory of social perception. *Psychological Review*, 90, 215-238.
- Miller, L., Dovidio, J. F., & Keating, C. F. (1984, April). *Status, gender and smiling*. Paper presented at the annual meeting of the Eastern Psychological Association, Baltimore, MD.
- Napier, J. R., & Napier, P. H. (1967). *A handbook of living primates*. New York: Academic.
- Rajecki, D. W., & Flanery, R. C. (1981). Social-conflict and dominance in children: A case for a primate homology. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp. 87-129). Hillsdale, NJ: Erlbaum.
- Redican, W. K. (1975). Facial expressions in nonhuman primates. In L. A. Rosenblum (Ed.), *Primate behavior: Developments in field & laboratory research* (Vol. 4, pp. 103-144). New York: Academic.
- Rinn, W. E. (1984). The neuropsychology of facial expression: A review of the neurological and psychological mechanisms for producing facial expressions. *Psychological Bulletin*, 95, 52-77.
- Rohwer, S., & Rohwer, F. C. (1978). Status signalling in Harris sparrows: Experimental deceptions achieved. *Animal Behavior*, 26, 1012-1022.
- Rosenfeld, H. M. (1966). Instrumental affiliative functions of facial and gestural expressions. *Journal of Personality and Social Psychology*, 4, 65-72.
- Schaller, F. B. (1963). *The mountain gorilla: Ecology and behavior*. Chicago: University of Chicago Press.

- Spitz, R. A., & Wolf, K. M. (1946). The smiling response: A contribution to the ontogenesis of social relations. *Genetic Psychology Monographs*, 34, 57-125.
- Steklis, H. O., & Raleigh, M. J. (1979). Behavioral and neurobiological aspects of primate vocalization and facial expression. In *Neurobiology of social communication in primates* (pp. 257-282). New York: Academic.
- van den Berghe, P. L. (1980). The human family: A sociobiological look. In J. S. Lockard (Ed.), *The evolution of human social behavior* (pp. 67-86). New York: Elsevier.
- van Hooff, J. A. R. A. M. (1967). The facial displays of the catarrhine monkeys and apes. In D. Morris (Ed.), *Primate ethology* (pp. 7-68). Chicago: Aldine.
- van Hooff, J. A. R. A. M. (1972). A comparative approach to the phylogeny of laughter and smiling. In R. A. Hinde (Ed.), *Nonverbal communication* (pp. 209-238). Cambridge: Cambridge University Press.
- van Lawick-Goodall, J. (1968). The behavior of free-living chimpanzees in the Gombe Stream Reserve. *Animal Behavior Monograph*, 1, 161-311.
- Vine, I. (1970). Communication by facial-visual signals: A review and analysis of their role in face-to-face encounters. In J. H. Crook (Ed.), *Social behavior in animals and man* (pp. 279-354). New York: Academic.
- Wickler, A. (1967). Sociosexual signals and their intraspecific imitation among primates. In D. Morris (Ed.), *Primate ethology* (pp. 69-147). London: Weidenfield & Nicolson.
- Wilson, E. O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Harvard University Press.
- Wolff, P. H. (1963). Observations on the early development of smiling. In B. M. Foss (Ed.), *Determinants of infant behavior* (Vol. 2, pp. 113-138). London: Methuen.
- Young, C., & Gouin-DeCarie, T. (1977). An ethology-based catalogue of facial/vocal behavior in infancy. *Animal Behavior*, 25, 95-107.
- Zivin, G. (1982). Watching the sands shift: Conceptualizing development of nonverbal mastery. In R. S. Feldman (Ed.), *Development of nonverbal behavior in children* (pp. 63-98). New York: Springer-Verlag.