FACIAL EXPRESSIONS OF EMOTION INFLUENCE INTERPERSONAL TRAIT INFERENCES

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ABSTRACT: Theorists have argued that facial expressions of emotion serve the interpersonal function of allowing one animal to predict another's behavior. Humans may extend these predictions into the indefinite future, as in the case of trait inference. The hypothesis that facial expressions of emotion (e.g., anger, disgust, fear, happiness, and sadness) affect subjects' interpersonal trait inferences (e.g., dominance and affiliation) was tested in two experiments. Subjects rated the dispositional affiliation and dominance of target faces with either static or apparently moving expressions. They inferred high dominance and affiliation from happy expressions, high dominance and low affiliation from angry and disgusted expressions, and low dominance from fearful and sad expressions. The findings suggest that facial expressions of emotion convey not only a target's internal state, but also differentially convey interpersonal information, which could potentially seed trait inference.

What do people infer from facial expressions of emotion? Darwin (1872/1962) suggested that facial muscle movements which originally subserved individual survival problems (e.g., spitting out noxious food, shielding the eyes) eventually allowed animals to predict the behavior of their conspecifics. Current emotion theorists agree that emotional facial expressions can serve social predictive functions (e.g., Ekman, 1982; Izard, 1972; Plutchik, 1980). For instance, Frank (1988) hypothesizes that a person might signal a desire to cooperate by smiling at another. Although a viewer may predict a target's immediate behavior on the basis of his or her facial expressions, the viewer may also extrapolate to the more distant future, as in the case of inferring personality traits.

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Interpersonal Trait Inference

According to Darwin (1872/1962), facial expressions of emotion eventually came to convey information not only about an expresser's affective state, but also about his or her interpersonal intent. Social psychologists have long acknowledged the powerful impact of first impressions on subsequent trait attribution. For instance, Secord (1958) hypothesized that perceivers base some trait inferences on static facial cues (e.g., hair, skin color, bone structure) in a process he called "temporal extension." In the case of emotional expressions, observers may apply temporal extension not only to static facial features, but also to dynamic changes in muscle configuration. Since emotional expressions purportedly convey interpersonal information, one might extrapolate that they should have an especially potent impact on interpersonal trait inferences.

Wiggins and his colleagues have developed a robust and replicable model of the interpersonal domain of personality, which preserves a 40-year history of circumplex representations of social behavior (Freedman, Leary, Ossorio, & Coffey, 1951). For example, Wiggins, Trapnell, and Phillips (1988) report that words which describe personality traits relevant to social interaction fall into a circle called the "interpersonal circumplex," which is bisected by the two orthogonal axes of "dominance" and "affiliation." A number of descriptive trait words can be derived from different combinations of these dimensions. For instance, an outgoing person would be high in affiliation and dominance whereas an introverted person would be low in affiliation and dominance. Similarly, a competitive person would be high in dominance but low in affiliation while a shy person would be low in dominance but high in affiliation (see Figure 1). A forty-five degree rotation of the interpersonal circumplex yields the two most social of the five ubiquitous traits found in personality psychology: extraversion and agreeableness. Neuroticism, conscientiousness, and openness, which are less implicated in social exchange, are not represented within the circumplex space (Wiggins & Pincus, 1992). Importantly, interpersonal traits describe not just how individuals behave, but how they behave in relation to others.

According to the circumplex model, if emotional expressions carry interpersonal information, then different expressions should carry different messages concerning both dominance and affiliation. Several investigators have examined connections between self-reported emotional *experience* and interpersonal traits. For instance, Schaefer and Plutchik (1966) proposed a circle of emotional experience that corresponds to dominant and affiliative trait terms. Similarly, Russell and Mehrabian (1977) have pro-

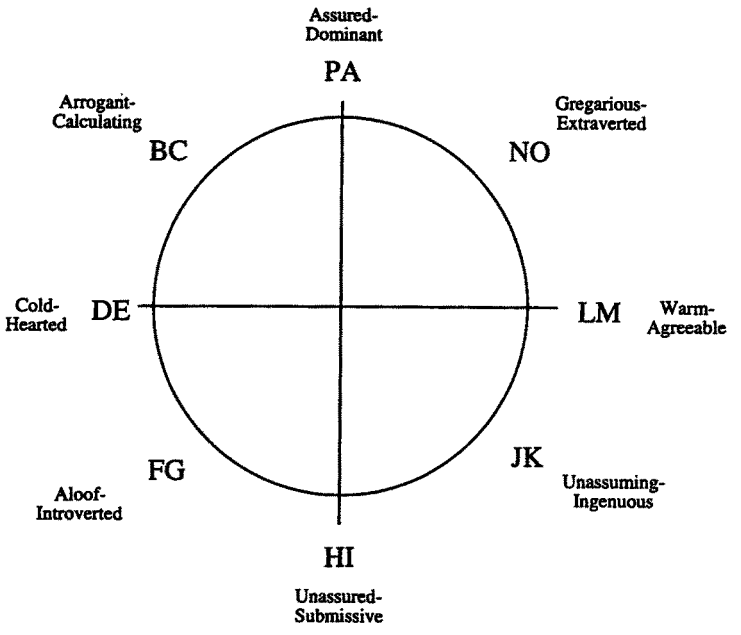

Figure 1. The Interpersonal Circumplex (from Wiggins, Trapnell, & Phillips, 1988).

posed a circle of emotional experience that maps onto the dimensions of dominance, valence, and arousal (although they did not explicitly refer to personality and subsequently dropped dominance from their model; see Russell, 1980). Fewer investigators have surveyed links between emotional *expression* and interpersonal trait inference. While Gifford (1991) found that some body movements can convey information about a target's dominance and affiliation, he did not include facial expression in his work.

Facial Expressions of Emotion

Ekman's (1993) set of "basic" facial expressions of emotion (anger, disgust, fear, happiness, sadness) provides an ideal set of stimuli with which to explore the impact of emotional facial expressions on interpersonal trait inference. These expressions are muscularly defined, and have been linked to specific and differentiable affective states by people in cultures around the world.

Some experimental findings suggest that specific facial features involved in these basic emotional expressions (e.g., brow and mouth) might

influence inferences of dominance and affiliation. Keating et al. (1981) found that an upturned mouth signals happiness in several different cultures, but that a lowered brow signals dominance only in Westernized samples (see also Keating, Mazur, & Segall, 1977). However, Keating and her colleagues did not distinguish between emotional states and personality traits in their rating scales, and focused on discrete facial features rather than full emotional expressions. Both of these factors may have diluted the cross-cultural generalizability of their findings. Using stimuli coded for facial muscle movements involved in "felt smiles," Matsumoto and Kudoh (1993) found that both Japanese and American subjects attributed more affiliation to smiling targets than to neutral targets. However, these investigators did not measure subjects' trait inferences about other facial expressions of emotion. Ekman (1979) has noted that a lowered brow along the midline of the face (a "v") signals anger, while a raised brow along the midline (an inverted "v") signals sadness or fear. Taken together, these findings suggest that the configuration of the mouth (i.e., zygomatic major muscle) may convey affiliation while the configuration of the *midline* of the brow (i.e., combined action of the corrugator supercilii and medial frontalis muscles) may convey dominance in a social encounter.

The different configurations of the brow and mouth muscles evident in different facial expressions of emotion may confer a unique dominance and affiliation signature to each. Specifically, expressions of happiness might convey high affiliation, while sadness, fear, anger and disgust might convey low affiliation because of the configuration of the mouth. Further, anger and disgust might convey high dominance, because the midline of the brow is pulled down, while sadness and fear might signal low dominance, because the midline of the brow is pulled up. In Experiments 1 and 2, these hypotheses were tested with static and dynamic expressive stimuli.

Experiment 1

Experiment 1 addressed whether targets' emotional facial expressions could alter viewers' interpersonal trait inferences. Subjects saw slides of people making the basic emotional expressions of anger, disgust, fear, happiness, sadness, and a neutral expression. Then they rated the dispositional dominance and affiliation of each target. Based on the mouth configuration, I predicted that subjects would infer high affiliation from happy expressions, neutral affiliation from neutral expressions, and low affiliation from angry, disgusted, fearful, and sad expressions. Based on midline brow configurations, I further predicted that subjects would infer high domi-

nance from angry and disgusted faces, neutral dominance from happy and neutral faces, and low dominance from fearful and sad faces.

Method

Subjects. A sample of 36 undergraduates from a large private university on the West Coast participated in six groups of six. Subjects received credit for a course requirement of their introduction to psychology class.

Materials. Slides of target persons making basic angry, disgusted, fearful, happy, sad, and neutral emotional expressions were selected from Ekman and Friesen's "Pictures of Facial Affect" (1976). Each stimulus had been previously rated by coders trained in the Facial Action Coding System (FACS) to display an emotion-relevant prototypical muscular configuration, or no muscular configuration in the case of the neutral stimulus. The final stimulus set (36 items in all) consisted of slides of six different targets (three male and three female) making each of the six different expressions. The slides were projected onto a .78 by 1.04 m screen.

Subjects rated each slide target on a series of thirty-two trait adjectives that sampled the interpersonal dimensions of dominance and affiliation, which were selected from the Interpersonal Adjective Scale, Revised (IAS-R; Wiggins et al., 1988). The IAS-R is empirically related to a wide range of individual difference variables, including preferences in mate selection (Buss & Barnes, 1986), the use of interpersonal manipulation tactics (Buss, Gomes, Higgins, & Lauterbach, 1987), and interpersonal problems (Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988). To shorten the measure, four adjectives with the highest factor loadings on each of the interpersonal octants were selected, based on the analysis of Wiggins et al. (1988). Thus, four adjectives represented high dominance (dominant, self-assured, assertive, self-confident), four represented a mix of high dominance and low affiliation (tricky, sly, crafty, cunning), four represented low affiliation (coldhearted, unsympathetic, warmthless, antisocial), and so on for each of the remaining six octants (refer to Figure 1). The questionnaire's instructions read: "Below are a list of words that describe how people interact with others. Based on your intuition, please rate how *accurately* each word describes the person presented in the slide using the 1 to 7 scales below" (adapted from Wiggins et al., 1988). Subjects then rated each slide target on Likert scale items anchored at "extremely inaccurate" (1), "somewhat accurate" (4), and "extremely accurate" (7). These trait ratings were then combined according to a formula adapted from Wiggins et al. (1988) to derive aggregate ratings of affiliation and dominance (see Appendix).

Procedure. Each group of subjects saw a set of six slides, each of which depicted a different target with a different expression (angry, disgusted, fearful, happy, neutral, or sad). Slide sets were presented in a random order. So, each group of subjects rated a unique combination of targets and expressions. Subjects had five minutes to rate the interpersonal traits of each slide target on the 32 IAS-R scales.

Results

Both the dominance items (Cronbach's $\alpha = .77$) and the affiliation items (Cronbach's $\alpha = .87$) of the 32-item adapted IAS-R showed high reliabilities that compared favorably to those found by Wiggins et al. (1988) with their 64-item measure.

Two separate 6 (expression type) X 6 (target) X 6 (group) X 6 (subject, nested within group) Latin Squares analyses of variance (ANOVAs) assessed overall differences in ratings of affiliation and dominance. I predicted a main effect of the slide target's expression on subjects' ratings of affiliation and dominance, but no main effects of target, group, or subject.

Affiliation. The first ANOVA supported the hypothesis with a significant effect of expression type on ratings of affiliation, $F(5, 170) = 43.72$, $p < .001$, but no significant effect of target, $F(5, 170) = 1.19$, *ns*, group, $F(5, 30) = 1.15$, *ns*, or subject within group, $F(30, 170) = .86$, *ns*. Post-hoc tests (Tukey's HSD, $p < .05$) indicated that expressions fell into three groups in terms of their affiliation ratings: (1) the happy expression received higher affiliation ratings than other expressions ($M = 2.09$, $SD = 1.03$); (2) fearful ($M = .54$, $SD = 1.12$), sad ($M = .10$, $SD = 1.18$), and neutral expressions ($M = .05$, $SD = .96$) received lower ratings and did not significantly differ from each other; and (3) angry ($M = -1.32$, $SD = 1.15$) and disgusted expressions ($M = -1.13$, $SD = 1.26$) received the lowest affiliation ratings but did not differ significantly from each other (see Figure 2).

Dominance. A second ANOVA showed a significant effect of expression type on ratings of dominance, $F(5, 170) = 25.11$, $p < .001$, but no significant effect of target, $F(5, 170) = 2.01$, *ns*, group, $F(5, 30) = 1.57$, *ns*, or subject within group, $F(30, 170) = 1.12$, *ns*. Post-hoc tests indicated that expressions fell into two groups in terms of their dominance ratings: (1) happy ($M = 1.02$, $SD = .66$), angry ($M = .85$, $SD = .83$), and disgusted expressions ($M = .60$, $SD = .78$) received significantly higher ratings of dominance than the remaining expressions, but did not differ from each other; and (2) sad ($M = -1.04$, $SD = 1.28$), fearful ($M =$

−.74, *SD* = 1.44), and neutral expressions (*M* = −.33, *SD* = 1.26) received significantly lower ratings of dominance, but did not differ from each other (see Figure 2).

Discussion

Slide targets' emotional expressions influenced subjects' ratings of their dispositional affiliation and dominance as predicted. Specifically, subjects rated targets with happy expressions as high in affiliation, they rated targets with angry and disgusted expressions as high in dominance but low in affiliation, and they rated targets with sad and fearful expressions as low in dominance. These differences did not depend on which target made the expression or which subject rated the expression. Thus, within this stimulus set, a target's emotional expression eclipsed the influence of his or her static facial structure on subjects' interpersonal trait inferences.

However, some expressions also had unexpected effects on subjects' interpersonal trait inferences. First, subjects rated targets with happy expressions as high on dominance as well as affiliation. This finding is surprising in that it is contradictory to the claim that low-dominance people smile more often (e.g., Henley & LaFrance, 1984). Second, subjects rated targets with sad and fearful expressions as neutral on affiliation rather than

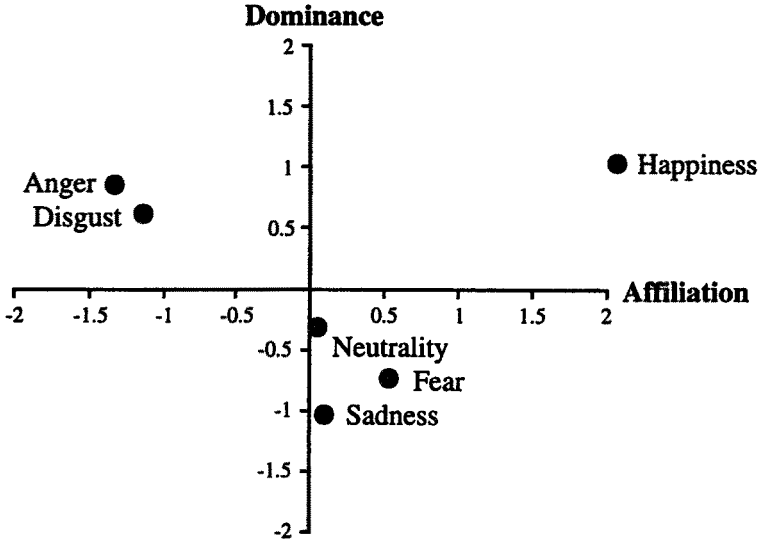

Figure 2. Dominance and affiliation ratings for slide expressions.

low on affiliation. This may have occurred because the similar configuration of the mouth in expressions of anger and disgust may convey lower affiliation than the configuration of the mouth in expressions of sadness or fear.

Based on subjects' interpersonal inferences in this experiment, one can characterize these emotional expressions in terms of three qualitative groups: high affiliation/high dominance or "approach" expressions (happy), low affiliation/high dominance or "attack" expressions (angry, disgusted), and low dominance or "avoid" expressions (sad, fearful, neutral). These groupings correspond with some of the misclassifications that people make when they categorize pictures of facial expressions. For instance, in classification tasks, subjects often confuse disgust and anger expressions, and rarely confuse other expressions with happiness. However, the confusion of fear and sadness expressions evident in this experiment occurs less frequently in expression labeling studies (see Ekman, 1982). Experiment 2 explored whether this pattern of interpersonal inferences would generalize to a dynamic presentation of the same expressive stimuli.

Experiment 2

The results of Experiment 1 suggest that emotional facial expressions convey varying impressions of dominance and affiliation. However, people do not usually have the luxury of staring at a larger-than-life face frozen into a full-intensity emotional expression for five minutes. Instead, they usually catch momentary glimpses of others' dynamic expressions (e.g., temporarily raised eyebrows or tightened lips). Nonetheless, people can make accurate interpersonal inferences based on remarkably "thin slices" of nonverbal behavior (e.g., Ambady & Rosenthal, 1993). To introduce some external validity into the manipulation, yet still avoid confounds like poor expression quality and extraneous muscle movement, I asked subjects to rate the interpersonal traits of "apparent-motion" expressive targets.

The findings of Experiment 1 suggested that some of the initial hypotheses required revision. Specifically, (1) happy faces conveyed high dominance as well as high affiliation, and (2) sad and fearful expressions conveyed neutral rather than low affiliation. So, this experiment further tested the replicability of the pattern of findings found in Experiment 1.

Method

Subjects. A sample of 36 undergraduates from a large private university on the West Coast participated individually in a fifteen-minute experiment for $2.50. Subjects were recruited by sign-up sheets on bulletin boards around campus.

Materials. Computer images were fabricated from the slide stimuli used in Experiment 1. The slide images were first printed on photographic paper and then scanned into the Macintosh computer with a Howtek Personal Color Scanner at 75 dots per inch. The images' contrast was increased by about 40% with an image processing program. The images were presented in a 7.5 by 10 cm rectangle in the center of a computer screen.[1]

Subjects rated each computerized target on a series of eight trait adjectives that sampled the dimensions of affiliation and dominance (antisocial, assertive, cunning, friendly, introverted, outgoing, submissive, and undemanding). Based on the data collected in Experiment 1, these adjectives showed the highest factor loadings on each octant of the circumplex. The rating scales were anchored as follows: "not at all descriptive" (1), "somewhat descriptive" (4), and "extremely descriptive" (7). As before, subjects' ratings of the adjectives were combined to form aggregate measures of dominance and affiliation.

Procedure. Subjects read instructions on a Macintosh SE/30 computer informing them that they would see and rate images of seven different people. The computer presented subjects with a practice image of a target making a surprised expression. The target's composite image consisted of the following parts: (1) a focus cue that lasted for two seconds, (2) a target's face with a neutral expression for one second, (3) the same target with a surprised expression for one half of a second, and (4) the same target with a neutral expression again for three seconds. This composite image created an "apparent motion" effect in which a neutral face flashes an emotional expression for half a second before reverting to its original neutrality. The entire presentation lasted 6.5 seconds. The rest of the expressive targets followed this sandwiched pattern except for the control targets, who retained a neutral expression throughout the presentation.

Subjects saw and rated seven targets in all, including the practice target. As in Experiment 1, after the practice target, subjects saw six targets with six different expressions (anger, disgust, fear, happiness, neutral, and sadness) in a random order. They rated each target on the series of eight trait adjectives that sampled the dimensions of dominance and affiliation.

Results

The reduced dominance (Cronbach's $\alpha = .79$) and affiliation measures (Cronbach's $\alpha = .74$) had high reliabilities which compared surprisingly well with the reliability of the longer inventory used in Experiment 1. As in Experiment 1, two separate 6 (expression type) X 6 (target) X 6 (group) X 6 (subject, nested within group) Latin Squares ANOVAs tested

for differences in subjects' ratings of targets' affiliation and dominance. I predicted a main effect of emotional expression and also possibly of target, since subjects saw each target's neutral face as well as their emotional expression, but no effect of group or subject.

Affiliation. The first ANOVA supported the hypothesis with a significant effect of expression type on ratings of affiliation, $F(5, 170) = 23.61$, $p < .001$, but no effect of target, $F(5, 170) = 1.30$, *ns*, group, $F(5, 30) = .89$, *ns*, or subject within group, $F(30, 170) = 1.27$, *ns*. Only the targets' emotional expressions influenced subjects' ratings of affiliation, despite the fact that subjects also saw each of the targets' neutral faces. As in Experiment 1, post-hoc tests suggested that expressions fell into three groups in terms of their affiliation ratings, but also that some blurring occurred between the ratings of the two lower groups. Happy expressions once again received significantly higher affiliation ratings than all other expressions ($M = 1.97$, $SD = 1.08$). However, the angry ($M = -.82$, $SD = 1.15$) and neutral expressions ($M = -.77$, $SD = 1.42$) received significantly lower affiliation ratings than sadness ($M = .20$, $SD = 1.30$). Fear ($M = -.18$, $SD = .85$) and disgust ($M = -.40$, $SD = 1.36$) expressions fell between these extremes and so did not differ significantly from the remaining expressions (see Figure 3).

Dominance. A second ANOVA with ratings of dominance as the dependent measure also yielded a significant main effect of expression type, $F(5, 170) = 8.47$, $p < .001$, as well as target, $F(5, 170) = 5.28$, $p < .001$, but no main effects of group, $F(5, 30) = 2.28$, *ns*, or of subject within group, $F(30, 170) = .66$, *ns*. The significant main effect of target indicated that the neutral faces which framed the emotional expressions may also have influenced subjects' dominance ratings. Post-hoc tests confirmed a replication of the dominance pattern found in Experiment 1: (1) angry ($M = 1.49$, $SD = 1.01$), disgusted ($M = 1.15$, $SD = 1.57$), and happy expressions ($M = 1.14$, $SD = 1.16$) received significantly higher dominance ratings, but did not differ from each other; and (2) sad ($M = -.15$, $SD = 1.78$), fearful ($M = .01$, $SD = 1.93$), and neutral expressions ($M = .04$, $SD = 1.52$) received significantly lower dominance ratings, but did not differ from each other (see Figure 3).

Discussion

As in Experiment 1, targets' emotional expressions influenced subjects' inferences of dominance and affiliation. Specifically, different expressions

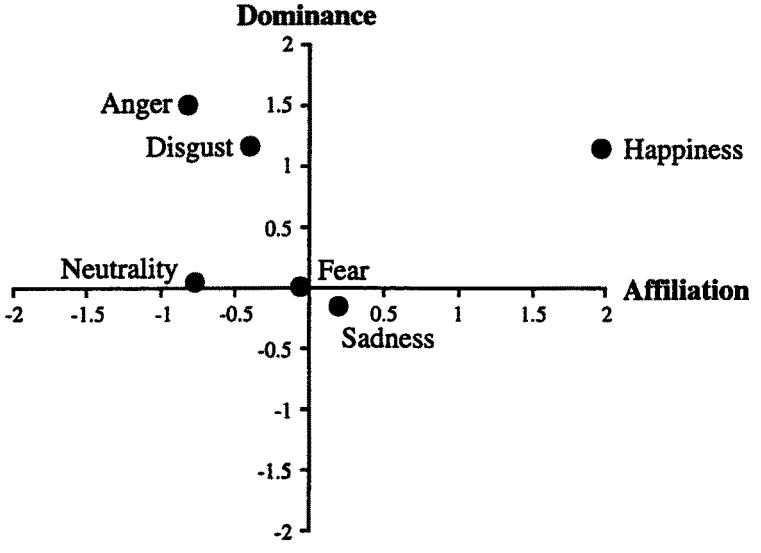

Figure 3. Dominance and affiliation ratings for apparent motion expressions.

engendered a similar pattern of affiliative and dominance inferences in the context of an apparent-motion, as opposed to a static, presentation. These effects persisted in Experiment 2 in spite of the fact that expressions were shown in smaller format with poorer resolution for a shorter time period. The neutral expressions framing the emotional expressions did not influence subjects' ratings of affiliation, but did affect subjects' ratings of dominance. So, while emotional expression overrode facial structure in its influence on subjects' affiliative inferences, both expression and structure contributed to subjects' inferences of dominance.

Subjects in this study, but not in Experiment 1, rated the "neutral" expression as less affiliative than the sad or fearful expressions. This may have occurred because the neutral face remained static, while all of the other faces moved. Thus, the mere fact that a face moves expressively may connote some degree of affiliation on the part of the target, or at least an intention to engage in interaction (cf. Field, 1994).

The salience and recognizability of posed emotional expressions might invoke the specter of demand characteristics. In order to reduce the potential influence of demand characteristics, the word "emotion" as well as specific emotion labels were never mentioned to subjects in the context of the experiment until the debriefing. The experiments were instead described as an exercise in "intuitive perception." Even so, the brief length of

expression presentation in this experiment (.5 second) should have minimized potential influences of demand characteristics. Specifically, in order to conform to the experimenter's hypotheses, subjects would have had to go through the following steps: (1) fix the emotional label for each expression in their minds, (2) calculate the weighting scheme for combining items into aggregate measures of dominance and affiliation, (3) predict the experimenter's hypothetical placement of the expressions on the interpersonal circumplex (some of which were derived from the findings of Experiment 1), and (4) systematically fill out the multiple trait ratings to conform with the hypothesized placements. If subjects could negotiate this complex process in the short time they had to view the expressions of the targets and complete the rating scales, that suggests that they had executed the process before, it had achieved some degree of automaticity, and so was not due to an artifactual demand engendered by the particular experimental setting of Experiment 2.

General Discussion

Facial expressions of emotion appear to provide a potent stimulus for interpersonal trait inference. The findings of two experiments demonstrated that emotional expressions can influence subjects' inferences about a target's dispositional dominance and affiliation. In Experiment 1, subjects inferred high dominance and high affiliation from happy expressions, high dominance and low affiliation from angry and disgusted expressions, and low dominance from sad and fearful expressions. Subjects made a similar pattern of inferences in Experiment 2 when presented with apparently moving expressions.

These findings contribute to the literature by forging empirical links between universally recognized facial expressions of emotion and the functional theoretical framework of interpersonal traits. While some of these links were predictable, others were not. For instance, happy faces conveyed high dominance as well as high affiliation to viewers, while sad and fearful faces conveyed low dominance but did not convey low affiliation. Notably, targets' emotional expressions overshadowed (in Experiment 1) or rivaled (in Experiment 2) the influence of facial structure on trait inference. Why would people temporally extend from emotionally expressive cues rather than the more invariant static cues of physiognomy? Perhaps because emotionally expressive cues tell an observer not only something about the emotional state of the target (i.e., "being worked-up"), but also something about the implications of the target's emotional state for the

observer (i.e., aggressive, avoidant, or approaching)—information which carries immediate survival value. In terms of interpersonal theory, when a target makes an emotional expression at an observer, the observer might implicitly ask some basic interpersonal questions like "is this person likely to harm me?" (dominance) and "is this person likely to help me?" (affiliation). The observer's answers to these (not necessarily correlated) questions might then "emotionally seed" interpersonal trait inference via temporal extension.

Implications

An interpersonal heuristic. The findings suggest that people may use others' emotional facial expressions as a heuristic or rule-of-thumb for making interpersonal inferences. For the purposes of this discussion, I will refer to a face's closeness to any universally recognized emotional expression as "emotionality." A face's emotionality should partially determine how much dominance and affiliation it conveys. This heuristic has a number of implications for the study of social interaction. First, it describes specific cues that people can use to make dispositional inferences about others whom they have not spoken with, as in the zero-acquaintance paradigm. For instance, Watson (1989) found that people who sat together in a room for fifteen minutes without talking could rate each others' traits such as agreeableness and extraversion to some degree of accuracy (see also more recent work by Kenny, Horner, Kashy, & Chu, 1992). Second, the heuristic highlights a nonverbal channel by which people's expectations might determine the outcome of an interaction, as in the case of "self-fulfilling prophecy" (Snyder, Tanke, & Berscheid, 1977). For instance, if Fred assumes that a woman is outgoing because he sees her smiling in a photograph, he may act more sociable when meets her, which may encourage her to reciprocate with sociable behavior. However, several factors are likely to temper people's use of this putative heuristic.

Contextual qualifications. Various contextual factors must undoubtedly play an important role in modulating peoples' willingness to make trait inferences from emotional expressions. For instance, other expressive features may play a role such as the target's gaze direction. In Experiments 1 and 2, subjects saw pictures of emotionally expressive faces projected onto either a wall or a computer screen. Since the targets looked straight ahead, subjects presumably saw the targets' expressions as directed at themselves. Thus, the expressions referred to the observer. In this stripped-down approximation of an interaction, subjects made reliable trait inferences about

the expressive targets, and they did so in a systematic way without additional contextual qualification. Thus, subjects' inferences might constitute a kind of "default," based on the minimal requirement of viewing a facial expression directed at one's self. However, subjects might change their interpersonal inferences if the expressions were directed not at them, but rather, at someone or something else.

Information from other emotionally expressive channels, both verbal and nonverbal, might also dilute the interpersonal impact of facial expressions, especially if that information fails to "match" the interpersonal message conveyed by the face (e.g., Scherer, Scherer, Hall, & Rosenthal, 1977). Lens-model studies (e.g., Borkenau & Liebler, 1992; Funder & Sneed, 1993) can more effectively tease apart the relative impact of facial versus other expressive channels on trait inference.

In addition to other expressive cues, the interpersonal context of a facial expression might modulate observers' tendencies to make trait inferences. For instance, familiarity may make a difference. People may make more trait inferences even from the relatively unexpressive face of a stranger, since they do not know what constitutes a neutral baseline for that person (Secord, 1958). Some empirical evidence suggests that even neutral faces of unfamiliar targets can convey emotional cues. Malatesta, Fiore, and Messina (1987) demonstrated that subjects make consistent emotional inferences about purportedly neutral photographs of older targets. I have collected data with the stimuli used in this study which demonstrates that subjects attribute different emotions to different "neutral" (FACS-coded) targets. Further, Berry (1991) found that while observers' trait inferences of the power and warmth of photographed "neutral" targets corresponded with the targets' own self-ratings, observers' ratings of "attractiveness" or "babyishness" (a.k.a. "schematicity") did *not* mediate this correspondence. If, as suggested by these findings, people make inferences about interpersonal traits on the basis of facial expressions of emotion, then they may even apply the emotionality heuristic to presumably neutral faces. For instance, upon meeting Joe, they may initially assume that he is irascible because of his heavy brow or that Lisa is convivial because of her upturned lips. Based on this logic, observers should be less willing to leap to these interpersonal conclusions about familiar people.

Prospects for future interaction may also moderate people's willingness to make trait inferences from transient expressions. For instance, people may pay more attention to emotional expressions when they are considering a joint venture which requires future cooperation, and therefore, trust. Such "commitment problems" pervade social relations, and range from decisions about whom to invite to lunch to decisions about whom to

marry (Frank, 1988). As the potential level of commitment escalates, so do the costs of missing trait cues. However, overzealous observers run the countervailing risk of perceiving nonexistent expressions.

Finally, the "display rules" that operate in a given social setting may modulate people's tendency to make trait attributions from facial expressions of emotion (cf. Ekman, 1972). People may be more tempted to draw trait conclusions from expressions which flaunt convention. For instance, if Jill laughs at a funeral, observers may be more likely to see her expression as evidence of a personality trait than if she cries. All of the aforementioned contextual qualifications potentially limit the generalizability of these findings to naturalistic contexts, but the impact and relevance of each qualification also requires empirical documentation.

Summary

These exploratory studies present a first test of a conceptual framework that could help to integrate the study of facial expressions of emotion and interpersonal traits, should it withstand empirical scrutiny.

Validity. The goal of these studies was to link universally recognized emotional expressions with inferences about interpersonal traits. Thus, I did not systematically vary the specific facial features that I thought would affect observers' inferences of dominance and affiliation. Microanalytic facial coding systems (i.e., FACS) and computer graphics can help to pinpoint and manipulate expressive features of the face implicated in these experiments.

Generalizability. To claim that a stimulus affords adaptive information for humans, one must present evidence that people from diverse backgrounds respond to it similarly. Because of the homogeneity of my sampling population in terms of age and socioeconomic status, I lack such evidence. However, the method of Experiments 1 and 2 are amenable to translation and transport to diverse subject populations.

Conclusion. These experiments highlight some important social functions of facial expressions of emotion—they can elegantly and efficiently convey messages of both dominance and affiliation to observers. Extending Darwin's speculations, emotional facial expressions may "seed" interpersonal inferences, not only for the immediate but also for the distant future.

Note

1. Written consent was obtained for these stimulus transformations from Paul Ekman.

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Appendix

Formulae for Deriving Aggregate Measures of Dominance and Affiliation from the IAS-R (Adapted from Wiggins, Trapnell, & Phillips, 1988)

1) Octant scores are computed from adjective ratings:
   PA = (dominant + self-assured + self-confident + assertive)/4
   BC = (tricky + sly + crafty + cunning)/4
   DE = (cold + unsympathetic + warmthless + hardhearted)/4
   FG = (introverted + unsociable + unsparkling + antisocial)/4

HI = (timid + unauthoritative + shy + unaggressive)/4
JK = (uncunning + uncrafty + undemanding + unsly)/4
LM = (gentle + tender + agreeable + sympathetic)/4
NO = (friendly + outgoing + extraverted + cheerful)/4

2) Dominance and affiliation scores are computed from these octant scores:
DOM = PA − HI + .707(NO + BC − FG − JK)
AFF = LM − DE + .707(NO − BC − FG + JK)