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Perceptual recognition of facial affect: Cross-cultural comparisons

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Previous research has shown that the perception of affect in faces is well described by the fuzzy logical model of perception (FLMP). In this study, we asked whether the processes involved in recognition depended on the race/culture of the face and/or of the perceiver. A computer-generated face was used to manipulate two features of facial affect: brow deflection and mouth deflection. An expanded-factorial design was used, with four levels of brow deflection crossed with four levels of mouth deflection, as well as their corresponding half-face conditions. Participants identified these faces as either happy or angry. Japanese and U.S. students were tested on faces from these two countries that were texture-mapped onto the animated face. The FLMP gave the best description of performance for both groups and for both types of faces. These findings challenge previous claims of holistic perception, categorical perception, and additive feature integration.

A research project currently under way in our laboratory is to develop a synthetic speech system using both the face and the voice. The primary goal has been to duplicate the movements involved in the production of spoken language (Massaro & Cohen, 1994). In addition, it is possible to texture-map a specific face onto the animated face to give the illusion of an identifiable person who is talking. It quickly became apparent that an important aspect of a talker is his or her facial expression. As participants in communication, we take for granted our ability to convey and perceive facial expressions of emotional affect. To simulate expression in our talking head, it was first necessary to identify features of the face that would communicate specific emotions. We accordingly adapted our paradigm for inquiry to this study. This approach allows the investigation not only of the cues that people use to recognize facial expression, but also of how they are processed to achieve perceptual recognition (Massaro, 1987).

Given our talking head (Cohen & Massaro, 1993, 1994), it was possible to use a set of stimuli that would be standardized and replicable, as well as controllable over a wide range of feature dimensions. The features of this synthetic face are independently controllable, fully quantifiable, and easily replicable. The fact that individual features can be varied within the face without the "cutting and splicing" used by other researchers simplifies the process of displaying features in a controllable manner, while simultaneously maintaining a highly realistic facial image. Ambiguous, contradictory, and partial feature presentations can be tested very easily, meeting one of the requirements of our paradigm for inquiry. We used an expanded-factorial design, as illustrated in Figure 1. The advantages of the expanded-factorial design are that single features as well as all feature combinations are tested. This design provides a strong test of models of perceptual recognition and judgment (Massaro & Cohen, 1990).

In an initial study, we examined the perceptual recognition of facial affect (Ellison & Massaro, in press). We carried out two experiments using an expanded-factorial design, with five levels of brow deflection crossed with five levels of mouth deflection. The single-factor conditions presented just the upper half of the face or the lower half. These so-called half-face conditions provide corresponding single-factor conditions that are important to include with the factorial conditions. Thus, there was a total stimulus set of 35 faces—25 whole, 5 upper-half, and 5 lower-half faces. In one experiment, we used a two-alternative forced choice between Happy and Angry, and in another, we used nine rating steps from Happy to Angry. The results indicated that participants evaluate and integrate information from both features to perceive affective expressions. Both choice probabilities and ratings showed that the influence of one feature was greater to the extent that the other feature was ambiguous. The fuzzy logical model of perception (FLMP) fit the judgments from both experiments significantly better than an additive model. Given the good fit of the FLMP with its assumptions of continuous and independent features, the research by Ellison and Massaro questions previous claims of categorical and holistic perception of affect.

The goal of the present study was to extend this paradigm to animated faces that give the appearance of a real person. With this technique, we propose to test whether the race of the face and the race/culture of the perceiver

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