



Title	HUMAN EMOTIONS : THEIR NEW IMPORTANCE AND THEIR ROLE IN SOCIAL REFERENCING
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Citation	乳幼児発達臨床センター年報, 4, 1-7
Issue Date	1982-03
Doc URL	http://hdl.handle.net/2115/25194
Type	bulletin (article)
File Information	4_P1-7.pdf



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HUMAN EMOTIONS : THEIR NEW IMPORTANCE AND THEIR ROLE IN SOCIAL REFERENCING

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One of the most striking developments in contemporary psychological theory is the resurgence of interest in the field of human emotions. The historical neglect of human emotions is easy to document. In the 1954 edition of Woodworth and Schlosberg's *Experimental Psychology*, one of the standard reference works in the field, there were three chapters dealing with human emotions, mostly devoted to demonstrating the difficulty of measuring discrete emotional states, and to proposing a dimensional approach to the study of emotion. By 1971, when Kling and Riggs edited the next edition of the same reference work, there were *no* chapters devoted to human emotion, and only scattered references in the index under entries such as "conditioned emotional response" or "emotionality."

The neglect of emotion came from two preconceptions. One, widespread in philosophy, activation theory, and cognitive theory, was that emotions were epiphenomenal—that they played no causal role in behavior. In discussing the feeling component of emotion, for instance, Bowlby (1969) drew an analogy between hedonic states and the color of a metal upon its being heated. Just as the whiteness of a metal plays no causal role in the malleability of a metal, so hedonic tone plays no causal role in the causation of behavior. Kagan (1978) is another who has stated that emotional states are epiphenomenal. Although he has advanced our understanding of emotional development in infancy greatly, Kagan's interest in emotion, like Bowlby's, lies in what emotions signify. For Kagan, the observation of emotions like smiling or fear is important because they reflect crucial cognitive processes like assimilation or failure to assimilate. In Kagan's view, it is not necessary to postulate that emotions have either a feedback or feedforward role in the stream of behavior.

The second basis for the neglect of emotion was the widespread belief that emotional states could not be measured with any degree of specificity or accuracy. Following the work of Sherman (1927) and Landis (1929), psychologists came to the conclusion that it was not possible to judge, from facial expressions alone, whether a person was in a happy, fearful, angry or other emotional state. There were also reports that in non-Western cultures such as China, the meaning of a smile was quite different from what it was in Europe or North America : Smiling frequently accompanied conditions, like attendance at funerals, where sadness rather than smiling would be expected, leading Klineberg (1940) to

The preparation of this paper was supported by NIMH grants MH-23556 and MH-22803. A more complete treatment of these ideas is presented in chapters by Campos and Stenberg (1981) and Klinnert, Campos, Sorce, Emde, and Svejda (1982).

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argue that emotional expressions were socially learned. Autonomic responses fared no better as indices of emotion. Time and again, researchers attempted to show the presence of autonomic response patterns that were closely related and specific to discrete emotional states, but the attempts consistently ended either in failure or at best, a very weak and partial relationship between autonomic pattern and emotion (Lacey, 1957). A similar state of affairs existed in the field of psychoendocrinology, in which variables like 17-OHCS and adrenalin seemed more closely related to the level of activation of the organism, regardless of cause, than to the discrete emotional experience reported by the subject (Mason, 1968).

The beliefs that emotions were neither causal nor measurable resulted in an understandable reluctance to consider their significance for behavior. Interestingly, even in clinical psychology, a field in which emotions seem to play such a critical role in everyday therapeutic interactions, emotions were neglected except as signals that an underlying conflict involving non-emotional dynamics was taking place. In the Freudian theory, for instance, the hydraulic theory of *drives* and *drive energies* replaced the notion of "strangled affect" as the causal processes underlying neurotic symptom formation. The reasons for neglecting emotions were thus pervasive and persuasive.

The resurgence of interest in the field of human emotions has resulted from challenges posed to the two beliefs that emotions are not measurable with specificity, and that emotions are not determinants or organizers of important aspects of human behavior. Both of these challenges date only from the early 1970s. Inspired by Tomkins' (1962, 1963) theory of emotion, both Carroll Izard (1971 ; 1977) and Paul Ekman (Ekman, Friesen, & Ellsworth, 1972 ; Ekman, 1973) presented evidence that the early studies purporting to show no accurate recognition of facial expressions were seriously flawed, and no way adequately tested the facial expression patterning hypothesis. Moreover, their empirical studies, conducted cross-culturally in one case with aborigines who had virtually no contact with the Western world (Ekman, Sorensen, & Friesen, 1969) documented that facial expressions were judged with great accuracy by all culture groups tested. Moreover, the facial expressions of persons from other cultures could similarly be rated with great accuracy by judges from Western countries such as the United States. From this cross-cultural work, there emerged lists of primary emotions (i.e., emotions which can be consistently and accurately judged cross-culturally). These lists range from 6 to 10 basic or primary emotions, but all include joy, surprise, fear, sadness, anger, and disgust.

The cross-cultural work implied that facial expressions were universal and hence innate, thereby leading to the prediction that the facial expression patterns of primary emotions should be observable in human infants from the age that the emotion becomes adaptive for the baby (Izard, 1979). Within the past two years, a number of empirical studies carefully measuring facial movements in infants exposed to situations designed to elicit discrete emotional states (such as the visual cliff, restraint of movement, disappearing objects, medical inoculations, etc.) have found facial expression patterns fairly congruent with the templates predicted by Tomkins, Izard, and Ekman and Friesen (1975). The facial patterns for surprise, joy, anger, pain, disgust and to some extent fear, have now been identified in human infants in the first year of life—that is, before the infant has developed the cognitive skills of deferred imitation (Piaget, 1945) which must underlie display rules

of emotional control (Hiatt, Campos, & Emde, 1979; Stenberg, Campos, & Emde, 1982; Stenberg & Campos, in preparation; Izard, Huebner, Risser McGinnes, & Dougherty, 1980).

The finding of emotional response patterning was not limited to facial expression. In an elegant series of investigations, Scherer (1979) demonstrated patterning in the human voice, substantiating earlier claims by Davitz and Davitz (1964) and others (see Harper, Wiens, & Mattarazzo, 1978 for a review). Autonomic response patterning has also been recently shown for heart rate and blood pressure (Schwartz et al., 1981). Moreover, given the increasing acceptance by information processing theories of the inclusion of verbal reports as scientific data (see Ericsson & Simon, 1981), it was no longer taboo to talk about conscious *feeling* states, where specificity of emotion is undeniable. The convergence of these many lines of evidence on the measurement of emotion has thus helped make the concept respectable once again.

Lagging only slightly behind the interest in measurement of emotion has been a far more profound development: Emotions are now being considered as powerful *organizers* of both intra-psychic and inter-personal processes. Indeed, it may be that the distinguishing characteristic of emotional states rests in their capacity to serve as powerful determinants of *both* internal psychological processes *and* of social interaction. That is to say, any psychological process that serves both intra-personal and inter-personal regulation deserves to be considered an emotion, whereas processes that serve only one or the other or neither of these processes should be assigned a different rubric or label in order to keep conceptualizations clear and articulate.

A recent paper by Gordon Bower of Stanford (Bower, 1981) very clearly demonstrates one inter-personal function of human emotions. In the course of studying state-dependent learning and recall, Bower placed students into a hypnotic trance, induced a discrete emotional state (such as fear, anger, joy or sadness), had subjects memorize a list of nonsense syllables, and later gave them a test for recall. The recall test was given in the same or a different mood state than the acquisition mood. Bower reported that if the recall was administered when the subjects were in the same mood as in the original learning, retention was optimal *regardless* of what the initial learning mood was. Retention was poorest in the mood state that was the *opposite* of that in original learning [e.g., fear and anger are opposites and sadness and joy are opposites in Plutchik's (1980) theory of emotion]. Retention rate was intermediate in mood states different from that of original acquisition or its opposite. Emotions, therefore, must have the function of helping to organize the storage and retrieval processes of the human being.

In addition to serving as organizers of intra-psychological processes such as memory, perception, selection of behaviors, and thought processes, emotions also serve critical inter-personal social regulatory functions. This point has long been advocated by researchers in the field of nonverbal communication but the impact of these researchers is only now beginning to be felt. In our laboratory in Denver, a group of us including Dr. Robert Emde, Dr. Mary Klinnert, Dr. James Sorce, Dr. Marilyn Svejda and myself, have begun a line of research which deals with one of the important social functions that emotional expressions can serve: that of *disambiguating* uncertain situations. That is, when a person, particularly an infant, is faced with a situation which he cannot fully understand or which produces both approach and avoidance tendencies, the person is likely to (a) *seek out* emo-

tional information from significant others in the environment, and (b) then to utilize that information to help determine how to behave in that uncertain setting. This two stage process of searching for and utilizing emotional information from others is called *social referencing* by us (Campos & Stenberg, 1981). A recent study from our laboratory will illustrate the great power of emotional information to determine behavioral outcomes, in contrast to the heretofore-prevalent epiphenomenal view of emotions.

In this study, we first needed to create a condition that produced some uncertainty on the part of the infant. We chose to use a visual cliff apparatus to create uncertainty, because of our extensive prior experience with the visual cliff (Campos et al., 1978), and because depth is a physical dimension that can be conveniently manipulated to produce intense avoidance (e. g., a four-foot-drop), no avoidance at all (e. g., a drop of only one or two inches), or an intermediate state of uncertainty (which we found to take place at about 12 inches for the typical 12-month-old infant we planned to test). In the testing situation, the infant was attracted toward the center of the cliff table by the combination of a pleasing toy placed atop the deep side of the cliff, and the mother's smile. However, when the infant reached the center of the cliff table, the mother shifted her facial expression either to a *broader smile*, to a *fearful face*, an *angry face*, and *interested face*, or a *sad* one. Our interest focused on whether the infant looked to the mother's face (which almost all infants did), and if so, whether their tendency to cross or not cross the deep side of the cliff was affected by the nature of the maternal facial pose. Our findings were dramatic: Approximately 74% of infants tested with the joy and interested expressions crossed the deep side of the cliff; on the other hand, only about 6% of the infants tested with fear and anger expressions crossed. The infants presented with the sadness pose were intermediate in crossing tendency: Approximately 33% of them crossed, but not before they showed some ambivalence and confusion about the nature of the signal the mother was posing, perhaps because the emotion of sadness has little relevance to the infant's appraisal of whether to cross the cliff or not. The importance of social referencing is thus clearly evident in infants as young as 12 months of age, and perhaps earlier. Developmental studies of the origins of social referencing are currently in the planning stage.

There are numerous other paradigms possible to assess the social regulatory functions of the emotional signals of others. Klinnert (1981) has pioneered a paradigm that involves the entry of an attractive but somewhat frightening robot toy into the room, at which time the mother expresses facially one of a number of discrete emotional expressions. The consequences of the posed expression are then assessed by determining the extent to which the infant retreats to the mother, approaches the toy, or shows other evidence of having been influenced by the emotional expression. This and other paradigms can also be used with channels of emotional communication besides the face, such as voice and gesture, and indeed we have strong evidence from our lab that vocal expressions of emotion from the mother powerfully regulate the infant's behavior even at as young an age as 8 1/2 months (Svejda & Campos, 1982).

The concept of social referencing, and that of the social regulatory function of emotion of which social referencing is but one instance, has numerous important implications. It is remarkable that in the study of mother-infant interaction, variables like social referencing have rarely been coded. Indeed, with the exception of gross dimensional catego-

ries like positive or negative responding by mother or infant, affect has rarely been the focus of study of mother-infant interaction. There seems to be little doubt that important individual differences exist between babies in the extent to which they reference their mothers in times of uncertainty, the clarity and frequency of mother's emotional signaling, and the manner in which they use the mother's emotional information to reduce uncertainty.

Empathy is another construct which clearly profits from the new conception of the role of emotion in behavior regulation. In the past, most treatments of empathy have focused exclusively on the cognitive underpinnings of empathy, such as perspective taking. The role of the specifically emotional expressions which may underlie empathic functioning has not received systematic treatment, despite the writings of social psychologists like Hoffman (1978). Empathy is a very important process for socialization and for the development of self-control. The new perspective provided by emotion theories may lead to great advances in our understanding of empathy.

Emotional expressions also mediate observational learning. It is very maladaptive for a baby to learn from direct experience to avoid dangerous environmental objects such as animals, plants, electric outlets, etc. The infant can learn avoidance of all these objects simply by observing the relationship between his action (e. g., reaching for a poisonous plant) and the caregiver's emotional reaction (e. g., a gasp and a scream), without needing to undergo direct emotional conditioning such as by becoming ill, getting bitten, etc. The mediation of learning may be one of the most pervasive functions of emotional communication in infancy.

The study of emotional communication and social referencing also has important implications for cross-cultural study. In some societies, emotional expressions are subdued relative to what they are in other cultures. What consequence does such expressive attenuation have for the style of interaction in that culture? In other societies, emotions may be expressed through one channel rather than another. For instance, in Japan, it appears that mothers express their fear, anger, and concern toward their child more in an auditory mode than in a facial one. In still other cultures, gestures may prove to be the most significant channel of communication. These cultural or national differences are likely to create differences in how a young child "reads" the feeling states of others, and this in turn may lead to differences in how the child behaves when hearing discrepant communications, or communications which happen to come from a nonpreferred channel.

The implications of social referencing are elaborated further in chapters by Campos and Stenberg (1981), Klinnert, Campos, Sorce, Emde, and Svejda (1982), Feinman (in preparation), and in an empirical report by Sorce and Emde (1981). Much work remains to be done to elaborate upon the developmental roots of emotional communication and social referencing; the extent to which different emotional communication styles are important parameters of the mother-infant interaction; the consequences of social referencing for empathy and later personality processes; and the extent to which social referencing plays a role in the everyday mediation of human behavior. It is to these and related questions that our collaborative effort in Denver is addressed.

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