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Social Referencing in Infancy

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Social referencing—the receipt and use of other persons' interpretations of a situation to form one's own understanding of that situation—influences much human behavior. Although not directed to the study of this phenomenon specifically, research on infant social behavior and cognitive functioning suggests that the requisite skills for social referencing develop in the second half-year. The first direct studies of this process have found that others' interpretations influence infant response by the end of the first year. Social referencing appears to influence infants in many of the same ways as it affects children and adults.

Human behavior is often influenced by social referencing, a process characterized by the use of one's perception of other persons' interpretations of the situation to form one's own understanding of that situation. Such interpretations may be explicitly requested, or they may be offered, received, and used although not actually solicited. Indeed, reference to others' interpretations is the foundation of culture as an integrated system of shared understandings, and characterizes social commerce in everyday life. The interpretation of sensation is often, although not always, a social enterprise in which the individual takes note of how others have defined the situation.

Social referencing is the hallmark of many social psychological theories, including social comparison (Festinger, 1954), affiliation (Schachter, 1959), conformity (Asch, 1951; Sherif, 1958), obedience (Milgram, 1974), modeling (Bandura, 1969a), and the symbolic interactionist theory of the "looking glass self" (Cooley, 1902/1964; Mead, 1934). The term *social referencing* derives from the concept

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of "reference group," which is the "set of significant others with whom the individual may compare his attitudes, beliefs and behaviors" (Webster, 1975, p. 115). As Merton and Rossi (1968) have noted, the term *reference group* is somewhat of a misnomer, since it can apply to individuals and social categories as well as to groups per se. Thus, reference groups and individuals influence a person's understanding and action.

The metatheoretical orientation of social-referencing theories is founded upon the assumption that people may base their actions upon the interpretation of sensation and can be infuenced in this process by others' understanding of the situation. It is not presupposed that all action is based upon this interpretative process. Rather, social referencing is postulated to occur when reaction is derived, at least in some part, from constructed reality as opposed to a more mechanistic sequence.

A social-referencing process may underlie the sequence, commonly observed in the laboratory and in everyday settings, in which an infant who meets an unfamiliar person looks to the caregiver before reacting to the stranger. It could be that the infant attends to the caregiver to elicit the caregiver's interpretation of the stranger. Then, the infant may integrate such interpretation into her/his own understanding of the stranger and, on the basis of this newly acquired knowledge, react to the stranger. It is the central thesis of this paper that social referencing is a significant process in infancy.

The plan of this paper is to evaluate the degree to which the social-referencing perspective provides a valid explanation of some features of infant behavior. Evidence from (a) previous research not designed specifically to investigate social referencing hypotheses, and (b) recent studies that have focused directly upon this phenomenon, will be considered. The major features of social referencing will be delineated and each of these features will be considered in terms of the evidence that adults, children, and infants can and do engage in such activity.

Characteristics of Social Referencing

Social referencing has two essential features. It can occur when the individual does not respond directly to stimuli, but converts sensation into meaning, and reacts on the basis of such interpretation. Second, in social referencing, individual perception is influenced by others' interpretations of the situation. Thus, social referencing takes place when reality is socially constructed so that action is founded upon interpretation which has been socially influenced by others' opinions.

There are two secondary features of social referencing which, although not inherent in its operation, occur so commonly that they characterize the process. First, there is greater reliance on the opinions of some people than others, i.e., social referencing is selective. Second, social referencing is heightened under uncertainty, when ambiguity renders individually-based judgment difficult and unclear.

Social Referencing Can Occur When Sensation Is Interpreted

There has been much consideration of the degree to which perception is based upon constructionist or mechanistic processes (Gibson, 1950; Lewis & Brooks, 1975; Piaget, 1954). If "perception is primarily dependent upon stimulation rather than on meaning" (Gibson, 1950, p. 11), social referencing is unlikely to occur. When there exists a mechanistic link between stimulus and response, there is not likely to be a point at which others' interpretations can influence the individual. But if reality is constructed, mental activity which transforms sensation into meaning provides a place at which influence from others can be received. Social referencing can occur if perception is based, at least in part, upon constructionist activities.

There is much evidence that constructionist processes can influence perception in adults and children, e.g., color perception (Berlin & Kay, 1969) and emotional reactions (Schachter, 1964). Similarly, it has been suggested that infant behavior often reflects the assimilation of sensation and the accommodation of schema prior to action (Cohen, DeLoache, & Strauss, 1979; Haaf & Bell, 1967; Lewis, 1969; Lewis & Brooks, 1975; McCall & McGhee, 1977; Piaget, 1954).

A more sophisticated form of construction is found in appraisal (Lazarus, 1968), in which the individual evaluates the likely consequences of contact with an object or person prior to reaction. Piaget (1952) noted that this activity becomes increasingly prominent between 6 and 12 months. For example, the looking behavior of second-semester infants with regard to an unfamiliar person may facilitate appraisal so that subsequent actions to the stranger can be based upon evaluation (Sroufe, Waters, & Matas, 1974). In this case, infant appraisal appears to consider the consequences of prospective interaction with the stranger, as if assessing the benefits and risks of contact.

While unfamiliar objects elicit longer looking times in the second semester, and perhaps longer periods of manipulation as well (Rubenstein, 1976; Schaffer, 1975), familiarity has a stronger influence upon latency to touching an object after 9 months of age (Schaffer, Greenwood, & Parry, 1972). Younger infants are likely to

reach for familiar and unfamiliar objects with equal speed, suggesting that the tendency for behavior to be based upon appraisal is not very clearly developed. But by 9 months, reaching for the unfamiliar object is more likely to be deferred until after a period of observation, suggesting a stronger inclination for action to await evaluation. Such appraisal could provide a point at which social influence can affect perception.

Effects of Social Influence upon the Interpretation of Sensation

In addition to assuming that the individual sometimes constructs meaning from sensation, social referencing requires receptivity to and understanding of others' interpretative messages. Then, this information is integrated into the individual's own understanding of the situation, and action is based upon the modified interpretation. Social-referencing messages can convey affective interpretation of an event, e.g., liking or fear, or they can transmit more instrumental information, e.g., descriptions of the characteristics of an object, or directions for performing a task.

In social referencing, individuals' interpretations are altered when they internalize another person's evaluation of the situation, subsequently modifying their actions in that situation. This internalization process contrasts with that of compliance, in which people alter their behavior in order to acquire rewards but without an accompanying change in understanding. In compliance, behavior changes but understanding does not (Kelman, 1961). But the internalization process that characterizes social referencing leads to behavioral change as a result of the alteration of individual perception. For example, among subjects who modified their expressed judgments of line length, Asch (1951) was able to distinguish between those who altered their judgments in order to go along with group opinions even though they did not agree with the group's judgment (compliance) and those who changed their judgments because others' opinions had truly modified their perceptions as well as their behavior (internalization). Social referencing is a process of internalization, and not one of compliance.

Direct and Indirect Social Referencing

Social-referencing information can be transmitted directly or indirectly. In the direct process, one person tells another about her/his affective or instrumental interpretations of the situation. For example, if two adults are in a car during a snowstorm, one might say to the other, "I think there will be a lot of snow before it's over" (in-

strumental), or "I'm really afraid of snowstorms" (affective). The emotional content of the interpretation may be conveyed verbally or through nonverbal channels such as voice tone.

Infants derive direct social-referencing information primarily from nonverbal cues. A 9-month-old confronted with a novel toy may look to a caregiver who then says to the infant, in a happy voice, "That's a pretty toy. Isn't that pretty?" While an older child could use the verbal as well as the nonverbal content of this statement, the 9-month-old probably relies on the affective tone of the caregiver's voice. Furthermore, the infant must interpret the caregiver's vocalization as information about the toy specifically, and not as an overture to interaction or an affective experience which modifies the infant's overall mood.

Social referencing can also function indirectly when a person observes how others act in a situation and infers the underlying interpretation from their behavior. For example, seeing father smile while he plays with a novel toy may allow the 9-month-old to infer that father likes the toy. The infant may assimilate this favorable interpretation, which can then influence her/his own behavior when given an opportunity to play with the toy. For indirect social referencing to be effective, the individual must use the other person's behavior to infer that person's interpretation of the situation specifically. For example, watching mother interact pleasantly with a stranger might induce jealousy in an 18-month-old if the mother's behavior is understood as information about the mother's availability rather than as a social referencing opportunity in which the mother's behavior implies her interpretation of the stranger. The distinction between direct and indirect effects has also been noted by other infant researchers (Lewis & Feiring, 1981; Parke, 1979).

Social Referencing and Imitation

When social referencing proceeds through an indirect pathway, the individual's subsequent behavior may imitate the other person's actions. While the behavioral outcomes of social referencing can be imitative, social referencing does not always result in imitation. The sight of a child crying at a large dog may lead to the inference that the child is afraid of the dog. One behavioral consequence of assimilating this interpretation can be imitative: the observer also could cry at the dog. But a fearful interpretation of the dog could also lead to nonimitative actions, such as flight or avoidance. When social referencing occurs directly, behavioral reaction is very unlikely merely to imitate the message. If one person tells another while pointing to

the edge of a cliff, "I'm afraid of heights," social referencing is unlikely to lead the other individual to react to the cliff simply by repeating this statement. One product of social referencing may be imitation but imitation and social referencing are not, by any means, isomorphic.

Social Referencing in Adults and Children

The vast social psychological literature on affiliation, reference groups, social comparison, conformity, and obedience indicates that adults can be influenced by others' interpretations. For example, in Festinger's (1954) theory of social comparison is the proposition that the evaluation of one's own opinions is facilitated by comparison with others' views. Similarly, Schachter (1959) suggested that a major motivation for affiliation is to learn of other persons' opinions. Studies of social influence commonly find that individuals are inclined to go along with others' interpretations, whether with regard to visual illusions (Sherif, 1958), the length of lines (Asch, 1951), or administering electric shocks to another person (Milgram, 1974). Along this line, Becker (1953) found that marijuana users' reactions can be shaped not only by the physiological effects of the drug but also through discussion of these sensations with other smokers. Even the self-concept is shaped by what others think, as implied in the phrase "looking glass self" (Cooley, 1902/1964; Rosenberg, 1979). The pervasive influence of modeling (Bandura, 1969a) has been noted in a wide range of behavior in adults, such as altruism (Latane & Rodin, 1969), reaction to electric shock (Craig & Prkachin, 1978), and even suicide (Phillips, 1974).

Likewise, children often replicate models' prosocial behavior (Friedrich & Stein, 1973) and aggression (Baron, 1977). Observation of the model's actions may modify the child's definition of appropriate behavior for that situation, resulting in immediate or deferred imitation. Deferred imitation would seem to be a type of social referencing since the delayed performance indicates that the demonstrated behavior may have modified the child's schema of the situation which, in turn, affected the child's behavior at a later time. Children are also influenced by direct messages, as when their self-concepts are affected by adults' expectations and evaluations (Entwisle & Webster, 1974; Rosenberg, 1979). Here the object to be interpreted is the child's own self-concept which, as symbolic interactionist theorists have noted (Cooley, 1902/1964; Mead, 1934), can be as much a target of social influence as are events external to the individual.

Are Infants Influenced by Others' Interpretations?

The most important indicator of social referencing is the nonreinforced and appropriate alteration of action following an interpretative message about the situation. It must be demonstrated that the message about the situation affects the infant's behavior. For example, studies in which caregivers are asked to provide different messages when infants confront a novel situation would be appropriate for the investigation of social referencing. Other behaviors which may be indicative of the social-referencing process are those in which the infant seeks and attends to information from others and appears to assimilate this input into her/his own schema of the situation.

Such information seeking may occur when the infant first views a novel object and then looks to the caregiver's face as if searching for emotional cues. The infant may delay behavioral reaction in order to search for and attend to information from others. Behaviors suggesting the assimilation of others' opinions and accommodation of the infant's schema of the situation may be further evidence that social referencing is proceeding. Given infants' limited verbal comprehension, one skill which enhances social referencing is the ability to discriminate among and react appropriately to emotional cues in other persons' facial expressions, voice tone, and touch. Indeed, the presence of this capacity is one indication of infant readiness to be influenced by others' interpretations.

It should be noted that these indicators of infant social referencing may be subject to alternative explanations. Behaviors which suggest that the infant is engaging in social referencing—actions which may reflect information seeking, attention, and assimilation—could also derive from other processes. Delay of action could be due to fear rather than to uncertainty and information gathering. Similarly, looking at the mother's face could be more social than informational. Infant looking may perform multiple functions, one of which is the acquisition of information from others about an ambiguous situation.

The operational definition of social referencing as a nonreinforced change in behavioral reaction that is caused by an interpretative message from another person is less open to alternative explanations. Nonetheless, even an actual change in infant behavior may result from another mechanism. Imagine that after hearing her/his mother speak happily about an unfamiliar person, a 1-year-old is friendlier than would be expected to the stranger. While this sequence is consistent with social referencing, it also might transpire because the nonverbal tone of the mother's voice has modified the

infant's mood generally. For this behavioral outcome to be considered the product of social referencing, it must be shown that the change is specific to the stranger and is not part of a generalized alteration of receptivity to other objects and people as well. If the infant is more receptive to other people or to a new toy as well as to the stranger after hearing the mother speak positively about the stranger, perhaps the mother simply has modified the infant's overall mood rather than influenced the infant's interpretation of the stranger. Mood modification does not represent an alteration of the infant's schema of the specific situation. But, in social referencing, a message about a particular entity influences behavior with regard to that entity and does not affect reactions to other objects and events in the environment.

There is evidence of infant behaviors and skills that may be indicative of social-referencing processes and products. Several studies have found that second-semester infants are sensitive to variations in facial emotion and react appropriately by smiling more to happy than to sad expressions. In most investigations, 2- to 5-month-olds either do not discriminate visually among facially-expressed emotion (Spitz & Wolf, 1946; Wilcox & Clayton, 1968), or discriminate only to a limited degree (Young-Browne, Rosenfeld, & Horowitz, 1977). While some investigators have found more clearcut visual discrimination in the first semester (LaBarbera, Izard, Vietze, & Parisi, 1976), it has been suggested (Klinnert, Campos, Sorce, & Emde, 1982) that such discriminations are not based upon emotional expression per se but, rather, on nonaffective facial features of the stimulus materials. Furthermore, infants younger than 6 months do not vary in their affective reactions to faces displaying different emotions. By comparison, second-semester infants not only discriminate visually among facial emotion shown by other people, but react appropriately as well, smiling more often to happy than to sad faces (Ahrens, 1954; Buhler & Hetzer, 1928; Charlesworth & Kreutzer, 1973). A detailed consideration of the early development of sensitivity to facially expressed emotion can be found in Klinnert et al. (1982).

Affect can be displayed vocally as well as visually, but there has been little research on infant recognition of vocally-expressed emotion (Cohen et al., 1979; Eimas, 1975). The finding that facial and vocal expression presented together are discriminated attentionally and affectively at 6 months (Charlesworth & Kreutzer, 1973) may indicate sensitivity to paralinguistically-expressed emotion. Similarly, appropriate affective reaction to happy and sad voices projected from behind a screen was reported at 5 to 7 months by Buhler and

Hetzer (1928), but the methodological quality of this early study is questionable. The limited extant data suggest, however, that sensitivity to vocal affect appears to emerge around 6 months.

There is even less known about infants' utilization of tactile and tension sensations, e.g., those provided when the infant sits on the mother's lap. This issue has been raised briefly with respect to methodological artifacts in reactions to facial expressions (LaBarbera et al., 1976), and with regard to its effect on reactions to strangers (Morgan, Levin, & Harmon, 1975). In the absence of direct investigation of these effects, the impact of emotion expressed tactilely or through tension is currently unclear.

Social referencing also can involve purely instrumental messages which demonstrate "what to do" rather than "how to feel," e.g., manipulation of a toy. Thus, some social referencing can occur even in the absence of the ability to interpret emotional messages. Nonetheless, the salience of interpretative indicators provided in emotional expression suggests that insensitivity to such information would greatly restrict the role of infant social referencing.

Studies of 6- to 18-month-olds frequently report that infants look toward caregivers when encountering a novel object, person, or event (Bretherton, 1978; Carr, Dabbs, & Carr, 1975; Feinman, 1980; Gunnar, 1980; Gunnar-Vongnechten, 1978; Rheingold & Eckerman, 1973; Haviland & Lewis, Note 1). Such behavior could serve to solicit and attend to messages about the situation. It is often noted that infants use their caregivers as bases of security, deriving comfort from the caregiver's proximity (Ainsworth, Blehar, Waters, & Wall, 1978). But caregivers may also serve as bases of information, providing interpretation of objects, people, and events. Unfortunately, studies which have found that infants look to caregivers in new situations have not indicated the extent to which looking serves to obtain social-referencing information as compared to reassuring the infant of the caregiver's presence.

When mothers are present but occupied in activities which reduce their availability for interaction with their infants, e.g., when they are talking with a stranger or reading a book, 15-month-olds (Fein, 1975) and 18-month-olds (Sorce & Emde, 1981) become distressed, decrease exploration, and look less often to the mother. These reactions could result either from the mother's emotional unavailability, as suggested by Sorce and Emde (1981), or because the mother's engagement in other activities limits the infant's access to her as a base of information.

There also are indications that infants exhibit some of the products of social referencing. Imitation may reflect the use of others' in-

terpretations to modify one's own evaluation of an event. Between 6 and 12 months, infants imitate unfamiliar as well as familiar actions (Abravanel, Levan-Goldschmidt, & Stevenson, 1976; Kaye & Marcus, 1978; Killen & Uzgiris, 1981; Paraskevopoulos & Hunt, 1971; Trevarthen, 1977; Uzgiris, 1972; Waite & Lewis, Note 2). Infants imitate their mothers' strategies for retrieving a hidden object at 6 months (Kaye, Note 3), and the toy preference and manipulation behavior of infant peers and adults at 12 months (Eckerman & Whatley, 1977; Eckerman, Whatley, & McGhee, 1979). Such evidence suggests that the infant's understanding of the situation may be influenced by interpretations implied by others' actions.

The issue of whether infants imitate in the first weeks and months of life has been much discussed (Anisfeld, 1979; Jacobson & Kagan, 1979; Masters, 1979; Meltzoff & Moore, 1977, 1979; Lewis, Note 4). Does early imitation indicate the beginning of social referencing? While some investigators have proposed that very young infants imitate (Meltzoff & Moore, 1977, 1979), it has also been suggested that apparent matching behavior can be an artifact of unsatisfactory experimental controls for arousal (Lewis, Note 4) and of improper statistical techniques (Anisfeld, 1979; Masters, 1979). Early imitation may reflect biological dispositions in feeding or clinging reflexive responses (Masters, 1979; Lewis, Note 4), or releaser effects (Jacobson, 1979; Jacobson & Kagan, 1979).

Regardless of whether or not early matching behavior is active imitation, its implications for social referencing are, at most, minimal. First, social referencing calls for the learning of new interpretations, but early imitation functions only with respect to behaviors already within the infant's repetoire, and especially for behaviors that involve reflexive action. Second, while referencing is a social process, early imitation may occur because the infant perceives the model's behavior to be its own and repeats it as a form of functional assimilation (Piaget, 1962). Third, although early matching behavior tends to resemble the demonstrated action generally, systematic accommodation of the infant's behavior to the model's actions is not found until 6 months (Kaye & Marcus, 1978; Uzgiris, 1972). In contrast, social referencing involves interpretative modification as a result of observing the model's actions. Furthermore, while social referencing tends to be selective, very young infants indiscriminantly match the behavior of various models (Waite & Lewis, Note 2, Note 5). Although early matching behavior appears to serve an important sociability function both for infants and for caregivers (Pawlby, 1977; Piaget, 1962; Uzgiris, in press; Lewis, Note 4; Waite & Lewis, Note 5), its value for social referencing appears to be negligible.

Several investigations have considered whether differences in infant behavior with regard to new people and environments can be correlated with variations in (a) caregiver behaviors which could have served as interpretative information, or (b) infants' attention to their caregivers in these situations. Clarke-Stewart (1978) did not detect significant differences in behavior to a stranger according to whether 30-month-olds had viewed their mothers interacting hostilely or pleasantly with the stranger. But Lewis and Feiring (1981) noted that 15-month-olds were friendlier to a stranger who had been seen talking in a positive manner with their mothers than to a stranger who had done so with another stranger or not at all. It was not possible, though, to sort out the relative impact of the mother's and stranger's behavior in that investigation.

Along a related line, Sorce and Emde (1981) reported that 18-month-olds acted more positively in ambiguous situations if their mothers responded reassuringly as compared to not responding at all when infants looked to them. But it was not noted whether infants' reaction had been influenced in the new situations specifically, or if the mothers' behavior simply affected infants' overall emotional tone. Feinman (1980) found that 7- to 15-month-olds were likely to move toward or pull away from an approaching stranger after glancing toward or touching their mothers. Unfortunately, the data did not permit an examination of whether these variations in infant behavior were caused by affective information provided in mothers' facial and tactile cues.

Investigations of Social Referencing

The key design feature in experimental studies of infant social referencing is the deliberate variation of the affective or instrumental message that others provide to the infant. With the exception of the Clarke-Stewart (1978) study, the investigations described above found patterns of infant behavior which are consistent with social referencing. But there are competing hypotheses which might account for these results. Several studies systematically varied the caregiver's message, but extraneous factors, such as the stranger's behavior, may have confounded the experimental design. Even when such outside factors were more effectively controlled, as in the Sorce and Emde (1981) study, it still cannot be determined whether the caregiver's message affected infant behavior with regard to the specific situation or more generally.

Several recent investigations have focused intentionally on infant social referencing. Feinman and Lewis (Note 6, Note 7) investigated the effect of social referencing upon reactions to strangers.

Similarly, Klinnert (Note 8) studied the influence of social referencing upon infants' behavior with novel toys. The impact of this process upon visual cliff behavior has been considered by Sorce, Emde, Klinnert, and Campos (Note 9).

In the Feinman and Lewis study (Note 6, Note 7), 87 10-month-olds were approached by a stranger while their mothers provided nonverbally positive or neutral messages each time the stranger paused during the approach. The mother spoke either directly to her infant about the stranger, or indirectly by letting the infant observe her speak to the stranger. There was also a control condition with no maternal communication. After the approach, the stranger sat next to the infant for a 1-minute period but did not initiate interaction. The mother gave her infant a toy when the stranger sat down. Analyses of variance[1] were performed to investigate the impact of (a) type of affect of mother's message (positive, neutral); (b) direction of mother's message (direct to the infant, indirect to the stranger); and (c) infant temperament (easy or difficult[2]) as measured by Carey and McDevitt's (1978) Revised Infant Temperament Questionnaire upon infant smiling, proximity, and toy offers to the stranger during the 1-minute period.

Infants whose mothers spoke directly to them smiled at the stranger more often in the positive than the neutral condition. Affect did not influence smiling when the mother spoke to the stranger. Although mother's affect had no impact upon difficult infants' proximity to the stranger, easy infants were more often proximate to the stranger in the positive than in the neutral affect condition. Similarly, infants offered the toy to the stranger more often in the positive condition than in the neutral condition but only when mothers spoke directly to infants of easy temperament.

When mothers communicated directly, especially to easy temperament infants, the results were consistent with the social-referencing expectation that mother's positive emotion would generate a more favorable interpretation of the stranger by the infant. Could it be, though, that the infant did not understand the mother's communication as information about the stranger? Perhaps the mother's affect modified the infant's mood generally, while not influencing her/his interpretation of the stranger.

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[1]Since the length and affect of message were positively correlated, the number of words expressed by the mother was included as a covariate in all analyses.

[2]The "easy" category consisted of Carey and McDevitt's (1978) easy and intermediate-low classifications, while the "difficult" category consisted of their intermediate-high, difficult, and slow-to-warm-up groups.

In order to compare the social referencing and the mood modification hypotheses, the three-way analyses of variance were rerun, using measures of infant behavior to the stranger minus behavior to the mother as the dependent criteria. In mood modification, the impact of the mother's message on infant smiles, proximity, and toy offers to the stranger will also be found for behaviors to the mother. Consequently, when behavior of the mother is subtracted from that to the stranger, the significant effects reported above for behaviors to the stranger will not be found. But in social referencing, affect of the mother's message will influence behavior to the stranger but not that to the mother. Therefore, the frequency of friendly behavior to the stranger minus that to the mother will be greater in the positive condition than in the neutral condition. The results of these analyses were not substantially different from those reported above for behavior to the stranger, suggesting that the mother's message did not simply modify the infant's overall mood. Rather, it appears that infants engaged in social referencing by utilizing their mothers' messages as information about the stranger specifically.

The finding that mother's affect did not influence infant behavior when the mother spoke to the stranger implies that, at 10 months, direct social referencing is more effective than indirect social referencing. Ten-month-olds may not attend to mother's affective tone when she speaks to a stranger, failing to understand that such vocalization can provide information about the mother's opinion of the stranger. Or perhaps the infant interprets maternal greeting of the stranger as a threat to the mother's emotional availability. Understanding that person A's behavior to person B can be used to infer the former's attitude toward the latter seems to be a skill which develops at a later time.

The results indicated that easy temperament infants engaged in social referencing more effectively than did difficult infants. Since the Carey and McDevitt (1978) Infant Temperament Questionnaire is multidimensional, further analysis considered whether one of these dimensions could account for this difference. The dimension which tapped infants' initial response to new situations provided the best discrimination among infants for direct social referencing. Infants who were rated as accepting of new situations were more influenced by mother's affect. Perhaps infants who were relaxed when meeting a stranger in an unfamiliar room were more receptive to their mothers' messages. Or this dimension may predict individual differences in social referencing because the mother's communication about the stranger was perceived by the infant as being novel since it provided new information about the situation.

The effect of social referencing upon infants' visual cliff behavior has been investigated by Sorce et al. (Note 9). While Feinman and Lewis (Note 6, Note 7) asked the mother to provide a message without waiting for the infant to request it, Sorce et al. (Note 9) asked the mother to provide a message only if the infant looked to her while on the visual cliff apparatus. On a full visual cliff, with an apparent 3½-foot drop, 12-month-olds would not cross over the deep side to reach their mothers, regardless of the message she provided.

But social referencing was found when the apparent height of the deep side of the cliff was reduced. Twelve-month-old infants were placed on the shallow side of a modified visual cliff with an apparent deep drop of 12 inches while their mothers stood at the deep side and smiled as the infant crossed the shallow side. When the infant confronted the deep side and looked at the mother, she either smiled or showed fear. While 14 of the 19 infants whose mothers smiled crossed the deep side, none of the 17 whose mothers exhibited a fear face would cross (Sorce et al., Note 9). Mothers' expression of sadness, in a further variation of this study, did not inhibit infant crossing as effectively as fear did (Campos, personal communication), suggesting that infants not only distinguish crudely between positive and negative emotion, but understand more subtle variations. Sadness is less likely than fear to imply danger in the visual cliff situation. In general, infants appeared to utilize their mothers as bases of information to aid them in interpreting the sensations provided by the modified visual cliff.

Klinnert (Note 8) studied the influence of social referencing on the reactions of 72 12- and 18-month-olds to three novel toys. Subjects were included in the study only if they looked at the mother's face after each toy was introduced. When the infant looked to the mother after seeing the toy, she displayed facial expressions of joy, fear, or neutrality, showing a different expression for each of the three toys seen by her infant. Looking to the mother when the strange toys appeared was a common infant behavior. Furthermore, 12- and 18-month-olds moved closer to the mother when she displayed a fear face, moved farther away from the mother and closer to the toy when the mother posed an expression of joy, and assumed an intermediate position when her expression was neutral. It would appear that these infants sought out and used their mothers' facial expressions as information about the new toys, so that their own interpretations of the toys were modified by the mothers' messages.

These direct investigations of social referencing indicate that infants' behavior can be altered by the emotional quality of the mes-

sage provided by mothers about unfamiliar people, novel toys, and a reduced visual cliff. This effect was found when messages were provided even though not requested by the infant (Feinman & Lewis, Note 6, Note 7) and when information was solicited by infant looking to the mother (Klinnert, Note 8; Sorce et al., Note 9).

It has been suggested (Klinnert et al., 1982) that social referencing is a process of secondary appraisal (Lazarus, 1968) which occurs after the infant has made the primary appraisal, i.e., the evaluation of whether the situation is threatening. The infant then looks to another person to obtain information about methods of coping with the situation or to seek refinement of that primary interpretation. The studies of social referencing regarding new toys (Klinnert, Note 8) and the visual cliff (Sorce et al., Note 9) were structured so that only the infants who first looked at the object of interest and then looked at the mother were included in the sample. But the results of Feinman and Lewis's (Note 6, Note 7) study suggests that even primary appraisal may be influenced by social referencing. In that study, the mother provided a message about the stranger before the infant had a chance to evaluate the stranger. Social referencing can be a process of secondary appraisal in which the infant first looks at a novel object or person, and then attends to the caregiver for further input. But if the caregiver's message is provided simultaneously with the infant's initial contact with the object, then social referencing may influence the primary appraisal as well.

Social Referencing Is Selective

Selectivity is commonly found in social referencing. Particular others vary in importance to the individual who is, as a result, inclined to refer preferentially to "significant others" (Sullivan, 1947), i.e., people who are especially valued and trusted. For instance, Rosenberg (1979) found that the mother's perception of her child was more likely to influence the child's self-concept than were the perceptions held by father, teachers, and peers. Significant others are likely to be perceived as powerful, competent, similar, and often nurturtant, characteristics which may fortify the desire to identify with, imitate, or accept the interpretations provided by another person (Bandura, 1969a).

Children more readily imitate the behavior of nurturant models (Hetherington & Frankie, 1967), especially when the model displays positive behaviors and when the social environment is cooperative (Bandura, 1969a). Similarity also tends to increase the probability of social referencing, as suggested by Festinger's (1954) assertion that

"someone close to one's own ability or opinions will be chosen for comparison." For example, Conviser (1973) found that adults were more willing to trust and follow the lead of a similar person. Along this line, Yinon and Kipper (1978) noted that the greater the similarity between the model's situation and the dilemma confronting children, the more likely they were to imitate the model's behavior. Experience of common reinforcement contingencies is a form of similarity which appears to be especially important in increasing the likelihood of social referencing (Bandura, 1969a; Bussey & Perry, 1976).

Powerful individuals are more likely to be the sources of social referencing (Bandura, Ross, & Ross, 1963), perhaps due to the belief that a person who controls rewards also knows how to obtain these resources. Not only are powerful individuals more likely to be consulted, but a person's power often increases when others refer to her/him, as suggested by the terms *expert power* and *referent power* (Raven, Centers, & Rodrigues, 1975). Other investigations indicate that adults and children are inclined to refer to sources who appear to be knowledgeable, competent, and experienced (Bandura, 1969a; Becker, 1953; Conviser, 1973).

The tendency for more informed people to provide reference and for less informed individuals to accept it underlies the universal tendency for culture to be transmitted from parent to child, rather than in the reverse direction. Similarly, the tendency to accept guidance and influence from higher status persons (Berger, Fisek, Norman, & Zelditch, 1977; Strodbeck, James, & Hawkins, 1957) may be founded upon the presumption that status implies knowledge. Indeed, when high status people receive negative consequences for their actions they are less likely to be imitated (Wiggins, Dill, & Schwartz, 1965).

In general, individuals tend to refer socially to people whose thought and behavior seem to improve the probability of receiving rewarding consequences (Bandura, 1969b, p. 203). The centrality of such consequences is suggested by the common finding that individuals are more likely to imitate a model who has received positive reinforcement for her/his actions (Walters & Parke, 1964). To the extent that nurturance, similarity, power, competence, and status predict likely outcomes, these features are used by individuals in selecting those to whom they socially refer.

Social-referencing selectivity also tends to be ego-protective. For example, children are more receptive to others' evaluations of them when these judgments are positive than when they are negative (Rosenberg, 1979). Furthermore, the inclination to reference

nurturant models is countermanded when acceptance of the model's orientation leads the child to make unfavorable self-evaluations (Bandura, Grusec, & Menlove, 1967). All other factors being equal, social-referencing information is more likely to be accepted and utilized when it appears to be favorable to the individual's own self-image.

The selectivity of social referencing is particularly salient when an individual receives contradictory messages from two or more sources. People sometimes average the two opposing opinions to formulate a compromise solution (Siegel & Siegel, 1957). In other cases one source is accepted over another, as when adolescents utilize peers more readily than parents as reference groups (Coleman, 1961). Furthermore, the source who appears to be more competent is especially likely to be consulted, while the opinions of less talented sources are discounted in proportion to their apparent ability (Webster, Roberts, & Sobieszek, 1972). There is some indication that the receipt of conflicting messages from significant others, e.g., differing interpretations from mother and father, may be associated with schizophrenia, psychosomatic disorders, and phobias in young children (Broderick & Pulliam-Krager, 1979). The relevance of such conflicts to social referencing has been noted previously by Campos and Stenberg (1981) and by Feinman and Lewis (in press).

Research on infant social referencing has not considered the issue of selectivity, but some indications can be found in other investigations. Little selectivity is found in early matching behavior (Jacobson, 1979; Waite & Lewis, Note 2), but it has been detected at 6 months (Waite & Lewis, Note 2). Lamb's (1976) finding that, when a stranger enters the room, 1-year-olds look more to their mothers than to their fathers suggests that the mother is the preferred source of situational definition. Also suggestive of a social-referencing preference for the mother is the finding that 10- to 14-month-olds look more to their mothers than to an infant peer or to that infant's mother (Field, 1979). The literature on infant attachment seems to imply that attachment figures are favored sources of information about the world (e.g., Ainsworth, Bell, & Stayton, 1974).

Social Referencing Is Heightened in Uncertainty

Others' opinions are more often sought and accepted in ambiguous situations. Adults who are assigned a perception task that is easy to solve, such as evaluating the lengths of clearly distinguishable lines (Asch, 1951), are less swayed by confederates' incorrect answers than are subjects asked to solve an unclear problem, such as

judging the movement of a point of light which appears to shift randomly (Sherif, 1958). Similarly, Schachter (1959) found a strengthening of the affiliative tendency when cognitive clarity was low and anxiety was high. In addition, Festinger (1954) noted that evaluation through social comparison is most likely to occur when objective standards for appraisal are absent. But even when cognitive clarity is high, social referencing may still affect judgment, as indicated by Asch's (1951) study in which subjects were socially influenced in making distinctions among clearly different lines, a task which solitary individuals performed accurately almost all the time. Thus, cognitive clarity reduces, but does not always extinguish, the impact of social referencing.

When there is a more mechanistic link between sensation and perception (Gibson, 1950, p. 11), social referencing is not likely to play a significant role. Likewise, social referencing should be especially ineffective when response is biologically directed in stimulus-response sequences which are not permeable to social influence. When learning is prepared (Seligman & Hager, 1972) so that particular behaviors can be taught very easily, social referencing may still influence learning, but the selectivity of social referencing probably would be diminished. Easily-learned behaviors are likely to be acquired from a wide variety of persons, while contraprepared behavior is difficult to learn from anyone. That infant learning sometimes fits a prepared learning model has been suggested by Sameroff and Cavanaugh (1979).

Are infants more likely to engage in social referencing in uncertain circumstances? Ten-month-olds look toward their mothers more often when a stranger is present than when alone with the mother (Corter, 1973). Since an unfamiliar person may be friend or foe, encountering a stranger is an ambiguous event which is likely to be amenable to the influence of social referencing. Similarly, 12- and 13-month-olds are more likely to look toward the mother when confronted with an uncontrollable toy than a controllable toy (Gunnar, 1980; Gunnar-Vongnechten, 1978). Since toys may also be subject to varying interpretation, e.g., a jack-in-the-box may be amusing or scary, receptivity to others' interpretations of unusual and new toys should be found (Klinnert, Note 8).

When a phenomenon either is clearly dangerous or obviously harmless, interest in social referencing, although not social contact in general, should decrease. Indeed, it was noted previously that 12-month-olds faced with a full visual cliff were not influenced by their mothers' emotional messages. Social referencing would appear not

to be effective when the infant encounters unambiguous natural cues of danger, as provided by an apparent drop of 3½ feet.

Although the series of experimental conditions under which social referencing regarding the visual cliff has been investigated (Sorce et al., Note 9; Campos, personal communication), and apparently was not constructed for the express purpose of systematically considering the impact of ambiguity upon social referencing, the results clearly indicate the effect of uncertainty. When the situation clearly was safe, as when the visual cliff was covered with a cloth so that depth cues were obliterated, infants were not affected by social referencing. A similar failure of mother's message to influence infant behavior was found for the full visual cliff, which clearly indicated danger. But when the situation was ambiguous, in the apparent 12-inch drop, the mother's facial expression influenced infant's locomotor behavior on the cliff. A 3½-foot drop always implies danger, and the absence of depth is clearly safe. In contrast, the impact of a fall of 12 inches is likely to be quite variable for 1-year-olds. When uncertainty is heightened, social referencing is likely to be especially effective in influencing infant behavior.

Future Directions in Social-Referencing Research

While there is now evidence that infants between the ages of 10 and 18 months engage in social referencing, several questions seem appropriate for the further investigation of this phenomenon. It has been suggested that social referencing may be more important for infants and toddlers than for older humans because uncertainty is greatest during the early years (Campos & Stenberg, 1981). On the other hand, Feinman and Lewis (Note 6) have noted that infants are not nearly as sophisticated at this activity as adults and older children are. Receptivity to other persons' interpretations is likely to become more finely tuned as cognitive skills and verbal understanding develop. Furthermore, although infants engage in social referencing with particular people, they do not possess the abstract representational capacity to be guided by the generalized other, i.e., the abstracted sense of the opinions of the community (Mead, 1934).

Although Campos and Stenberg (1981) have suggested that infants' reliance on others' interpretations will diminish with age, the voluminous literature on the importance of social influence and the social construction of reality indicates otherwise. Rather, it seems that social-referencing activity continues and perhaps even expands

as the developing child is exposed to an ever widening range of new events, and as maturing verbal understanding and cognitive sophistication allow the child to garner more precise opinions from others. Therefore, investigation of the developmental course of social referencing during the second and third years would be very much in order.

A related issue concerns the relationship between the development of social referencing and the emergence of cognitive and social skills believed to form the underpinning for this process. Is there a correlation between infants' skill at detecting and reacting appropriately to emotional expression and the capacity for social referencing? The discussion by Klinnert et al. (1982) of the sequence of developing sensitivity to affective cues would seem to be a valuable starting point for investigating this question. Other work might consider whether there is an association between the development of the capacity for appraisal and the emergence of social referencing. Within the context of considering the association of social referencing with affective and cognitive development, it would also be appropriate to investigate whether social referencing occurs before 10 months.

There has been much research on the selectivity of social referencing in adults and children. The investigation of the impact of this factor on infants and toddlers would do much to expand and refine the current understanding of early social referencing. Are infants who are securely attached more likely to seek out and accept information from their caregivers? Do infants socially refer to some people more than others, e.g., mothers compared to fathers? When might older siblings be used as sources of social information?

While there already has been some consideration of the role of uncertainty in social referencing, new investigations should explicitly manipulate situational uncertainty to determine its impact upon infant receptivity to other persons' interpretations. Such investigation would serve to delineate the boundaries within which social referencing functions. For example, one might investigate the hypothesis that the more experience an infant has had with a particular object, the less receptive he/she will be to social referencing regarding that object.

In conclusion, despite significant differences between sensorimotor infants and preoperational children, let alone between infants and adults, some aspects of infant behavior and perception can be understood by applying theories which have been formulated to explain the behavior of older humans. This appears to be the case for social referencing. Although it is clear that the 10- or 12-month-

old is not as sophisticated a social referencer as is the 6- or 60-year-old, the processes by which they all seek, receive, and use other persons' interpretations to formulate their own evaluations of situations appear to function in much the same manner.

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