Distinguishing Among Models of Nonverbal Exchange: Social Cognition, Arousal-Labeling, and Discrepancy-Arousal

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Abstract

Research has found that individuals will respond to an increase in nonverbal immediacy by either increasing or decreasing the immediacy of their own nonverbal behavior. As a result, a number of models have been put forward to account for these different responses. One approach (e.g., Anderson, 1985; Burgoon, 1983; Patterson, 1976) employs Schachter and Singer's (1962) arousal-labeling process as the mediating mechanism. A second approach, the discrepancy-arousal model (Capella & Greene, 1982), hypothesizes that the amount of arousal resulting from violated expectations determines the individual's behavioral response. A third approach (e.g., Ellsworth, 1978) suggests that simple social cognition may be the important mediating process instead of arousal-based mechanisms. An experiment was designed that would: 1) test the social cognition model; and 2) serve as a crucial test among the models. Individual male subjects discussed a moral dilemma with a male confederate at a seating distance of either 3.5 feet (control group) or 10 inches (two experimental groups). In an Intentional-Close experimental condition, the confederate was responsible for the close distance: he picked up a chair and moved it close. In a Forced-Close condition the confederate was forced to sit close due to the arrangement of the room and to instructions from the experimenter. Subjects in both of these close distance conditions

displayed nonverbal compensation (compared to subjects in the control group). However, only those subjects in the Intentional-Close condition evaluated the confederate more negatively (compared to subjects in the control group). The confederate evaluation results indicate that social information processing determines whether the individual's reaction to an increase in immediacy will be positive or negative. Combined with the results of past research, this finding suggests that social cognition alone determines whether nonverbal compensation or nonverbal reciprocation will occur. Furthermore, the arousal-labeling and discrepancy-arousal models are seriously questioned by the present findings.

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Introduction

Understanding how individuals respond to other peoples' nonverbal behavior has always been a concern of social psychologists. One particular issue in this field is how individuals respond to an increase in nonverbal immediacy (e.g., another person moves close to you during a conversation). Research has found that individuals will often react by either increasing or decreasing the immediacy of their own nonverbal behavior. A decrease in immediacy (e.g., reducing the amount of eye-contact) is called "compensation." An increase in immediacy (e.g., increasing your amount of eye-contact) is called "reciprocation."

In the late 1960s a flurry of research on this topic was stimulated by Argyle and Dean's (1965) intimacy-equilibrium model. Since then, a number of more comprehensive models have been proposed. The issue now preventing a resolution of the discrepancies between these models, and subsequent advances in understanding, is the nature of the underlying mediating process: which decisive factor determines the individual's behavioral response to an increase in nonverbal immediacy? This paper reports the results of a study that was designed to test among three general models of the mediating process. First, though, a review of these models and the relevant research is required. The original model will be discussed first.

The Models

The Intimacy-Equilibrium Model

Argyle and Dean (1965) proposed that a number of nonverbal behaviors (e.g., interpersonal distance, facial expression, eye-contact) affect the degree of "intimacy" which is experienced in social situations. These nonverbal behaviors operate to maintain a balance or equilibrium in the level of intimacy. When the equilibrium is disturbed by changes in one behavior, adjustments are made in others to restore it. These compensations may be due to a change in one's own behavior or in the other person's behavior. Approach and avoidance forces were said to determine the desired level of intimacy in any given encounter.

Empirical research on the model is often supportive. Many studies that provide support have manipulated a confederate's interpersonal distance and have measured the amount of adjustment in subjects' nonverbal behaviors (usually eye-contact). For example, Coutts and Ledden (1977) and Goldberg, Kiesler, and Collins (1969) found that subjects who were seated close to a confederate gazed at him less than other subjects who were seated farther away. However, other studies have found that nonverbal reciprocation may be the response to an increase in immediacy (Hayduk, 1983; Patterson, 1973).

Argyle and Dean did not elaborate on the nature of the proposed "approach-avoidance" forces, nor has subsequent research on the model focused on these suggested mediating factors. In the usual design, one or two nonverbal behaviors are manipulated and compensations in others are observed. Little else is involved or discussed.

The model was put forward to account for compensatory rather than reciprocal responses. When researchers discovered that nonverbal reciprocation is sometimes the reaction to an increase in immediacy, the model was soon abandoned because of its "vague appeal to approach and avoidance forces as the basis for equilibrium levels. The psychological basis for these forces is left unexplicated so that they become useful only in post hoc interpretations and useless as operating mechanisms for a priori predictions" (Cappella & Greene, 1982, p. 93, although see Knowles, 1980).

Researchers have since proposed more elaborate models that can account for nonverbal reciprocation as well as nonverbal compensation. These more recent models are all based on some kind of mediating psychological process which is presumed to determine the individual's behavioral response. Three possible mediating mechanisms have been suggested: 1) arousal-labeling, derived from Schachter and Singer (1962); 2) discrepancy-arousal; and 3) social

cognition. The present study is concerned with these three modern models, and not with Argyle and Dean's, original but out-moded Intimacy-Equilibrium model.

The Arousal-Labeling Model

Some researchers have applied Schachter and Singer's (1962) arousal-labeling theory of emotion to nonverbal immediacy reactions. Schachter and Singer's model consists of three main propositions:

> 1. Given a state of physiological arousal for which an individual has no immediate explanation, he will "label" this state and describe his feelings in terms of the cognitions available to him. To the extent that cognitive factors are potent determiners of emotional states, it could be anticipated that precisely the same state of physiological arousal could be labeled as "joy" or "fury" or "jealousy" or any great diversity of emotional labels depending on the cognitive aspects of the situation.
>
> 2. Given a state of physiological arousal for which an individual has a comletely appropriate explanation (e.g., "I feel this way because I have just received an injection of adrenalin") no evaluative needs will arise and the individual is unlikely to label his feelings in terms of the alternative cognitions available (Schachter & Singer, 1962, p. 381).
>
> 3. Given the same cognitive circumstances, the individual will react emotionally or describe his feelings as emotions only to the extent that he experiences a state of physiological arousal.

Schachter and Singer (1962) conducted a study that provides some evidence for this model of emotion. Their study will be described in order to make the arousal-labeling process clear. That study involved doing three things to subjects: 1) they were given an injection of

either epinephrine or a placebo; 2) they were either informed about the arousing effects of the drug or were not informed about its effects (some other subjects were misinformed about its effects); and 3) they were then put in a room with a confederate who behaved in either a euphoric or an angry manner.

The important finding was that epinephrine subjects who were not informed (or were misinformed) about the effects of the drug displayed either anger or euphoria depending on the behavior of the confederate. Their self-reported emotions also corresponded to the confederate's behavior. In other words, these subjects were aroused, did not know why, and "labeled" their arousal according to how the other person was behaving. In contrast, those epinephrine subjects who were informed of the drug's arousing effects did not display emotional behavior and did not report feeling angry or euphoric. When these subjects became aroused, they knew why and so the label-search process did not begin.

Patterson (1976), Burgoon (1983; Hale & Burgoon, 1984), and Anderson (1985) have all proposed models of nonverbal immediacy reactions that employ the arousal-labeling process as the mediating mechanism. A change in the other person's immediacy behavior is said to produce arousal in the individual. A change in interpersonal distance, for example, causes ambiguous arousal which, if sufficiently

strong, triggers an epistemic search for a "label." It is this label that determines the individual's response to the other person. Positive labels are presumed to result in nonverbal reciprocation, whereas negative labels result in compensation. Consistent with Schachter and Singer's arousal-labeling theory of emotion, these researchers emphasize that the arousal component is necessary (Anderson & Anderson, 1984, p. 336; Patterson, 1976, p. 239). The individual will not search for a label, will not make an attribution, and will not change his behavior unless he is aroused: "when the initial intimacy change is not sufficient to precipitate arousal change, no behavioral adjustments will be predicted" (Patterson, 1982, p. 232).

The models of Patterson, Burgoon, and Anderson are similar in their assumption that arousal-labeling is the mediating psychological mechanism that determines whether nonverbal compensation or nonverbal reciprocation will occur. However, there are some differences among the models. For example, although Burgoon (1983, p. 79; Hale & Burgoon, 1984, p. 290) mentions the "arousal-labeling process," she does not elaborate further. She is mainly concerned with interpersonal distance violations and with characteristics of the violator (e.g., status, attractiveness) that can lead to positive or negative outcomes. She places less emphasis on the mediating mechanism and more focus on the characteristics of the

violator.

Anderson (1985) is concerned with both the mediating mechanism and the different factors that affect the labeling of the arousal. In fact, Anderson prefers to use the term "valencing" instead of "labeling" because of "the lack of specificity with regard to the labeling process" (1985, p. 27). Nevertheless his model still belongs to the arousal-labeling "family." An increase in immediacy is thought to cause ambiguous arousal, which leads to an epistemic search for a "label" or "valence."

In sum, although the models of Patterson, Burgoon, and Anderson differ in their specifics, they are similar in their assumption that the arousal-labeling process determines whether nonverbal reciprocation or nonverbal compensation will occur. In the remainder of this paper their models will be collectively referred to as "the arousal-labeling model," although there are important differences among the models on issues other than the mediating mechanism.

Problems with Arousal-Labeling Model

There are a number of serious problems with the arousal-labeling model. Some of these problems are with Schachter and Singer's theory of emotion in general, in which case they are also problems for the arousal-labeling model of

nonverbal immediacy reactions. Other problems result from the extension of Schachter and Singer's theory to nonverbal immediacy reactions.

First, Patterson (1976, p. 242) and Anderson (1985, p. 27) clearly state that the arousal must be "noticeable" for the labeling process to begin. However, "while there is much empirical evidence supporting the assumption that emotional behavior is associated with autonomic arousal (Plutchik, 1962), there is little empirical evidence supporting the assumption that such autonomic activity is accurately perceived" (Blascovich & Katkin, 1983, p. 493; see also Reisenzein, 1983, p. 244; and Wilson, Hull, & Johnson, 1981). In fact, "only comparatively gross excitatory changes will draw attention and produce awareness of the state of excitation" (Zillman, 1983, p. 222).

Second, there is evidence that "accurate perception of visceral arousal is unnecessary for the experience of emotion" (Blascovich & Katkin, 1983, p. 494; see also Hirschman & Clark, 1983; Leventhal, 1980; Liebhart, 1979). Individuals only have to believe that they are aroused for the attribution process to begin.

A third problem with the arousal-labeling model is the growing evidence that physiological arousal is not necessary for the experience of emotion. For example, some misattribution studies have found that increased

physiological arousal fails to intensify subjects' emotional experiences. Other research has found that beta-adrenergic blockers, which reduce arousal, fail to reduce emotional reactions (see Leventhal & Tomarken, 1986, p. 574; Reisenzein, 1983, p. 258).

A fourth problem is that

> Schachter's approach to emotion is at variance with the fact that emotional reactions tend to be executed before the organism can attain feedback from autonomic changes. Behavioral responses to emotion-inducing stimuli can be quasi-instantaneous; the peripheral manifestations of autonomic responses, in contrast, have a characteristic latency of 3 to 15 seconds (e.g., Grossman, 1967; Newman, Perkins, & Wheeler, 1930). Quite obviously, emotional behavior would have had little adaptive value if individuals had to await feedback from excitation in peripheral structures in order to comprehend their reactions and decide on an appropriate course of action (Zillman, 1983, p 223).

Fifth, both Schachter's arousal-labeling theory and the extension of it to nonverbal immediacy reactions are based on the assumption that physiological arousal, such as that produced by another person's nonverbal behavior, is "ambiguous" or "undifferentiated." Physiological arousal is "neutral," and can be labeled as anger or euphoria depending on the circumstances. Yet some research evidence shows that arousal is often not affectively neutral (see Ax, 1953; Berkowitz, 1982, p. 252; Izard, 1977; Marshall & Zimbardo, 1979; Maslach, 1979; Rogers & Deckner, 1975; Tomkins, 1962; 1963; Truax, 1984). This implies that physiological arousal is not neutral or ambiguous, and that emotions cannot be the

sole result of ambiguous arousal-plus-label.

Finally, according to Schachter (1964) and Schachter and Singer (1962), the arousal must be unexplained for the label search process to begin:

> 1. Given a state of physiological arousal for which an individual has no immediate explanation, he will "label" this state and describe his feelings in terms of the cognitions available to him.
>
> 2. Given a state of physiological arousal for which an individual has a completely appropriate explanation, no evaluative needs will arise, and the individual is unlikely to label his feelings in terms of the alternative cognitions available (Schachter, 1964, p. 53).

A number of authors have pointed out that this model does not apply to most everyday emotions (e.g. Berkowitz, 1986; Leventhal, 1974; London & Nisbett, 1974; Nisbett & Schachter, 1966; Schachter, 1971; Shaw & Costanzo, 1982; Zillman, 1978). In the words of Berkowitz (1986), Schachter and Singer's model

> only to ambiguous situations in which people aren't at all sure just what is bothering them. They feel aroused but don't know why. The analysis doesn't hold when there are strong feelings for a clear-cut reason. Consider the men in the Riordan and Tedeschi (1983) experiment who thought they were about to receive painful electric shocks. In some cases the confederate in the room with them was a woman. As Riordan and Tedeschi pointed out, these men weren't unsure of their feelings. They knew why they were anxious about the forthcoming shocks, and consequently, they didn't attribute their arousal to the woman and think they were sexually aroused (p. 121).

Similarly, Ellsworth (1977) pointed out that the arousal

created by another person's nonverbal behavior is probably not unexplained:

> In Schachter and Singer's research the source of the arousal was not clear to the subjects, and in fact the obscurity of the true source of the arousal has been a necessary feature of most subsequent research dealing with misattribution. The case of a direct gaze, and probably other intimacy cues as well, is different, in that the perceiver is much more likely to notice the gaze and to recognize it as the source of his arousal. Most of the self-attribution experiments, particularly misattribution experiments, require that the source of the arousal be ambiguous enough so that some interpretation is necessary; if the stimulus is clear enough to lead to a specific inference, the concept of arousal may be unnecessary. (Ellsworth, 1977, p. 2-3)

In sum, the findings of research on emotion create a number of problems for Schachter and Singer's arousal-labeling model, and for the extension of it to nonverbal immediacy reactions. Individuals are not sensitive to their own arousal; accurate perception of arousal is not necessary for the experience of emotion; physiological arousal itself may be unnecessary for the experience of emotion; physiological excitation is slow, whereas behavioral responses are almost instantaneous; physiological arousal is not always ambiguous or neutral; and the arousal created by another person's nonverbal immediacy behavior is probably not unexplained. These findings suggest that another model of nonverbal immediacy reactions is required.

The Discrepancy-Arousal Model

Capella and Greene (1982) proposed a discrepancy-arousal model of nonverbal immediacy reactions. They assume that individuals have expectations about other peoples' nonverbal immediacy behaviors --expectations based on situational characteristics, social norms, individual preferences, and past experiences. A discrepancy between the actual and the expected amount of immediacy creates arousal. Following the work of Berlyne and Eysenck, arousal is assumed to have an inverted U relationship to the experience of affect. Moderate changes in arousal will be experienced as affectively positive or neutral. Large increases or decreases in arousal will be experienced as aversive. Positive affect is hypothesized to lead to nonverbal reciprocation whereas negative affect is hypothesized to lead to nonverbal compensation.

Although both cognition and arousal are important in this model, the emphasis is on the amount of arousal. The amount of arousal is hypothesized to determine whether nonverbal compensation or nonverbal reciprocation will be the response to an increase in immediacy.

Problems With the Discrepancy Arousal Model

The discrepancy-arousal model has only recently been put forward as an explanation of nonverbal immediacy reactions; little research on it has been reported so far. Nevertheless there are problems, some of which are the same

as those with the arousal-labeling model. For example, there is the evidence that individuals are relatively insensitive to their own arousal, and that arousal may be unnecessary for the experience of emotion. But there are other problems as well. For example, Anderson (1985) criticized the emphasis on the amount of arousal as the determining factor. He pointed out that social norms, preferences and relationship histories are independent precursors of affect without the mediating influence of arousal.

Another problem is the assumption that only the discrepancy between B's behavior and A's expectation creates arousal. This is a problem because other, non-discrepancy factors can also create arousal or lead to a change in immediacy behavior. Examples of such other factors include sexual arousal, liking, racial prejudice, cognitive overload, general anxiety, etc.

The biggest problem, which the arousal-labeling and discrepancy-arousal models have in common, is that behavioral reactions tend to occur before autonomic feedback can be obtained. Immediacy adjustments are very rapid: e.g., the other person suddenly looks you in the eye and you either hold his gaze or look away. These reactions occur so fast that it seems unlikely that an arousal-labeling or discrepancy-arousal process occurred. Feedback about

arousal from peripheral structures takes time (Zillman, 1983).

The Social Cognition Model

A number of authors have suggested that our responses to what other people say and do are determined by what we think about them or the social situation. Heider's (1958) book, "The Psychology of Interpersonal Relations," was perhaps the first formal statement of this view. The inferences that we make about the other people are said to determine our responses to them, rather than an arousal-based process.

An example of the social cognition view from outside the field of nonverbal behavior is Speech Accomodation Theory (Giles & Smith, 1979; Street & Giles, 1982). According to this theory, social cognition alone determines how individuals respond to other peoples' verbal behavior (see also Kraut & Higgins, 1983). Physiological or psychological arousal are not even mentioned. Other examples include Kelley's (1955) Personal Construct Theory; "implicit personality" theories (e.g., Wegner & Vallacher, 1977); and social cognition-based theories of personality (e.g., Epstein & Erskine, 1983; Mischel, 1973; Magnusson & Endler, 1977; Mancuso, 1970; Mischel, 1973;). These theories all assume that individuals constantly use their own implicit theories or constructs of social reality to make sense out of what is happening in their social environments. Their

responses are determined by their assessments.

Not surprisingly, a number of authors have assumed that social cognition alone determines our responses to other peoples' nonverbal immediacy behavior (see Altman, 1975; Ellsworth, 1977; 1978; Hall, 1966; Knowles, 1977; Konecni, Libuser, Morton, & Ebbeson, 1975; Leibman, 1970; Smith & Knowles, 1979). For example, Ellsworth (1978) is concerned with the individual's response to the gaze of another person:

> First, the person's initial inference will almost always be that the gazer is attending to him. .... If the gazer maintains a high level of gaze once it has been noticed, the target's next inference is often that the gazer is seeking some kind of interpersonal involvement--seeking to create a focused interaction where none existed, or to increase the level of intimacy or involvement in an ongoing interaction.
>
> Once the target has decided that the gaze signals a wish or an intent to increase the level of interpersonal involvement, s/he will also experience it as a demand for a response. Thus s/he will be motivated to do two things: 1) interpret the gaze itself in terms of the type of involvement it signals, and this inferred involvement may be positive or negative; and 2) figure out how to respond, and his or her attitude toward the response called for may also be positive or negative. If the first interpretation is positive, and the recipient of the gaze wants to respond (and knows why), his or her reaction to the gaze will be unequivocally positive. If either the gaze itself or the appropriate response is ambiguous, the recipient will be puzzled and will search for further contextual cues--whether or not s/he reacts positively to the gaze will depend on his or her success in finding a nonthreatening interpretation. If the initial interpretation is negative, and the recipient does not want to respond or does not know how to respond, the gaze will be experienced as aversive (p. 348).

A substantial amount of research on nonverbal behavior indicates that the social cognition model is indeed a plausible one. For example, evidence shows that observers "decode" personality characteristics, emotions, and attitudes from other peoples' nonverbal behavior. That is, individuals make a variety of attributions about other people based on their nonverbal behavior. Other research has focused on how personality characteristics, emotions, and attitudes are "encoded" into nonverbal behavior by actors. Many of the encoded nonverbal behaviors are the same ones that observers use to make inferences about others, which implies that their inferences must often be accurate (see Harper, Weins, & Matarazzo, 1978; Mehrabian, 1968a,b; 1969; Schnieder, Hastorf, & Ellsworth, 1979; Siegman & Feldstein, 1978).

An important issue regarding the social cognition model is whether social cognition is necessarily a conscious, deliberate process. The usual assumption is that social cognition can take place automatically, with or without awareness (Anderson, 1986; Arnold, 1970; Baars, 1981; Bargh, 1984; Bargh & Pietromonaco, 1982; Benoit & Benoit, 1986; Birnbaum, 1981; Ellsworth, 1978; Lazarus, 1982; Mandler, 1975, 1982; Motley, 1986; Rule, Ferguson, & Nesdale, 1979; Taylor & Fiske, 1978). A good example is driving an automobile. An experienced person can drive while, for example, talking to someone or listening to the radio. The

person is processing information about other cars on the road, etc., and is adjusting his behavior accordingly without "awareness" of doing so. The same can be applied to information processing during social interactions. In fact, recent evidence indicates that attributions about others are made "spontaneously," at the encoding stage, without awareness (Uleman, Winbourne, Winter, & Shecter, 1986; Weiner, 1985; Winter & Uleman, 1984).

Another example of the social cognition model of nonverbal immediacy reactions is Patterson's Sequential-Functional theory. After proposing an arousal-labeling model (1976), Patterson became aware of the problems involved (1978a; 1983b; Patterson, Jordan, Hogan, & Ferker, 1981) and made some modifications (1982; 1983a). The Sequential-Functional model assumes that people come to social interactions with a set of personality characteristics, past experiences, and "relational situational constraints." These three factors together determine the desired level of involvement in a social situation, and the amount of involvement that a person will initiate. When there is a large difference between the desired level of involvement and the actual level of involvement, a condition of "instability" results.

From this point on, however, it is unclear whether Patterson considers this theory to be a "new" theory or

simply a modified version of his arousal-labeling theory (Hayduk, 1983, p. 306). For example, he assumes that in conditions of instability both arousal-change and a "cognitive-affective assessment" may occur. As in the arousal-labeling model, "arousal change may serve as a signal to initiate a meaning analysis of the changing circumstances" (1982, p. 239). But then he goes on to say that such a meaning analysis is only one form of a cognitive-affective assessment that is

> to be broader than the self-labeling focus of the arousal model (Patterson, 1976). In fact, attributions about the other person and his/her motivations may have greater utility than those focused on one's own feelings. (Patterson, 1982, p. 240)

While Patterson appears to be moving away from arousal toward cognition, the unanswered question is whether or not the arousal component is necessary at all. Does arousal stimulate the cognitive-affective assessment? Or can the cognitive-affective assessment proceed and determine the response without arousal? If arousal is necessary for the cognitive-affective assessment to begin, then the Sequential-Functional model is simply a more sophisticated version of the arousal-labeling model. If arousal is not necessary, then the sequential-functional model is simply a straight, no-labeling social cognition model. Patterson (1978a; 1982; 1983a,b) does not take a strong stand either way, and implied that empirical research will determine the

exact nature of the mediating process.

Similarities and Differences Among the Models

The difference between the social cognition and the arousal-labeling model is subtle but important, and should therefore be stressed. In the arousal-labeling model, social information processing is stimulated by unexplained, ambiguous arousal. Only after becoming aroused and after searching for, and finding, a label does the individual modify his own nonverbal immediacy behavior. In the social cognition view, the arousal may be present, but it is not necessary. Attributions about the other person or the situation are the only determining factor. The individual constantly evaluates his social situations and does not need to be "awakened" by unexplained arousal. For example, in the case of gaze,

> realization that one is the object of another person's attention may be a more common consequence of the gaze than is a marked change in physiological arousal. Although there are empirical studies indicating that the gaze produces arousal, theoretically the arousal postulate may not be necessary. It could be argued that what is most important in our perception of the gaze is the realization that we are the object of someone's attention; the basic attributional mechanism, then, is a need to explain why another person is attending to us, rather than a need to explain our own arousal. Or, as Argyle and Cook point out, it is possible that the arousal is a consequence rather than a cause of the perception that one is being attended to, or that they are independent effects (Ellsworth, 1978, p. 348).

Patterson (1983b) gave a succinct outline of the important differences between the arousal-labeling and social cognition models:

> Ellsworth (note 1) and Knowles (note 2) both suggested that arousal may not be necessary in stimulating the attribution. Specifically, they proposed that a first stage in reacting to a change in the behavioral involvement of a partner may simply be an evaluation of the meaning of that behavioral change. In that case, the cognitive activity is primary and arousal may be either a consequence of that activity or simply a correlated event. Thus, physiological arousal might occur when a person is approached closely and touched by another, but not because the approach and touch per se are arousing, but because of the meaning of those behaviors (e.g., he likes me or he is threatening me).
>
> second, related criticism of the arousal-labeling model focused on the relative utility of self versus other attributions. Ellsworth (note 1) suggested that the self attribution proposed by the model seemed less likely than attributions about the other person or the environment. That is, a labeling or self attribution process may be a relative luxury when one has to determine how to react to another person. A more practical response would be a kind of meaning analysis that might focus on the behavior of the other person and the situational circumstances. Although self and other attributions may typically possess similar affective polarity, the affective tone of the self attribution is probably a less important determinant of a behavioral response than is the attribution about the meaning of the other person's behavior (Patterson, 1983b, p. 380-381).

It is also useful to contrast the social cognition model with the discrepancy-arousal model. Although both consider social cognition to be important, there are significant differences between the two. In the discrepancy-arousal model, it is the discrepancy between the expectations about another person's immediacy behavior and the other person's

actual behavior that creates arousal. The role of social cognition is solely one of creating expectations. After expectations have been violated, it is the amount of arousal that determines whether nonverbal compensation or reciprocation will occur. The social cognition model is different in that the amount of arousal is not important: social cognition alone is the determining factor. Once expectations have been violated, the individual wishes to know the reasons for the other person's behavior. The attributions that are then made about the other person determine the direction of the behavioral responses, not the amount of arousal.

Evidence for the Models

The purpose of this section is to review the research that has been done on the models in order to see if there is evidence that will help determine which model is correct. The review will focus on those studies that provide some support for the arousal-labeling model. It will be shown that both the arousal-labeling and social cognition models can account for the findings. The discrepancy-arousal model is more recent and no research on it is available for a similar analysis.

An experiment by Foot, Smith, and Chapman (1977) is often cited by Patterson as evidence for the arousal-labeling model. In this study, pairs of children who were strangers

or friends viewed cartoons together. It was found that the friends matched rates of smiling, eye-contact, and talking more than the pairs of strangers. Patterson claims that the friends labeled their arousal positively whereas strangers labeled their arousal negatively. But it is more parsimonious to claim that friends are more responsive to each other because they like each other more. This is the probable reason why friends experienced more positive arousal in the first place?

Whitcher and Fisher (1979) conducted a study on patients waiting in the pre-surgery room of a hospital. A device was measuring their blood pressure and the ward nurse either touched or did not touch the patients when greeting them. It was found that: 1) the touched patients showed greater physiological arousal than the non-touched patients; 2) touched females evaluated the nurse more positively than non-touched females and displayed nonverbal reciprocation; and 3) touched males evaluated the nurse more negatively than non-touched males and displayed nonverbal compensation. Patterson (1982; 1983a) claims that these results support the arousal-labeling model of nonverbal reactions but they support the social cognition view just as well: the inferences that individuals make about others are important determinants of their behavioral responses.

Coutts, Schneider, and Montgomery (1980) asked subjects

to interact with a confederate in a study designed to test Patterson's arousal-labeling model. While working on a task, a confederate responded either positively or negatively to subjects by either agreeing or disagreeing with them and by giving positive or negative feedback about what subjects said. In an interaction session soon afterwards, the confederate either increased or maintained the same level of immediacy (eye contact, smiles, body orientation) as in the first session. The subjects' amount of eye-contact, their number of smiles, body orientation, body lean, and heart-rate were measured. It was hypothesized that an increase in immediacy by the confederate should cause an increase in subjects' heart rate, and this was supported.

It was also hypothesized that subjects in the positive feedback condition should display nonverbal reciprocation in response to an increase in immediacy, whereas subjects in the negative feedback condition should display nonverbal compensation. These predictions were not supported: subjects in the positive feedback condition showed no significant change in nonverbal behavior, and subjects in the negative feedback condition actually reciprocated the confederate's increase in immediacy.

The reasons suggested by the authors for these findings were all based on subjects' interpretations of what

happened. For example, it was found that subjects who were exposed to an increase in the confederate's immediacy liked her more than subjects in the no-change condition. Further analyses indicated that "exposure to the accomplice's increase in immediacy increased subjects' liking for her in the negative feedback condition but not in the positive condition" (p. 551). The authors suggested that Aronson and Linden's (1965) gain-loss theory of attraction could account for some of the findings. This theory states that individuals will more favorably perceive people whose evaluations of them change from negative to positive, as compared to other people whose evaluations do not change. In this case, subjects in the negative feedback, increased immediacy condition probably thought that the confederate's evaluation of them had changed from positive to negative. These subjects therefore showed an increase in liking for the confederate and reciprocated her nonverbal behavior. The authors suggested that a ceiling effect probably occurred for positive feedback condition subjects (p. 558). In sum, the results of this study are consistent with both the arousal-labeling and the social cognition models.

It thus appears that some researchers have looked at the evidence for Argyle and Dean's Intimacy-Equilibrium model, have noticed that either nonverbal compensation or reciprocation can occur, and have applied the ambiguous, unexplained arousal/cognitive labeling findings of Schachter

and Singer (1962) to nonverbal immediacy reactions (Hayduk, 1983). Perhaps researchers have been so quick in applying Schachter and Singer's findings to nonverbal immediacy reactions because of evidence which shows that close interpersonal distances, or high levels of eye contact, can lead to an increase in physiological arousal in the "victim" (Aiello, DeRisi, Epstein, & Karlin, 1977; Aiello, Epstein & Karlin, 1975; Aiello, Nicosia & Thompson, 1979; Coutts, Schneider, & Montgomery, 1980; Gale, Lucas, Nissim, & Harpham, 1972; Gale, Spratt, Chapman, & Smallbone, 1975;Kleinke & Pohlen, 1971; McBride, King, & James, 1965; Middlemist, Knowles, & Matter, 1976; Schaeffer & Patterson, 1980; Whitcher & Fisher, 1979). This has been found for skin conductance level, heart rate, blood pressure, and EEG waves.

However, nonverbal immediacy behavior affects both person perception and arousal. Although the arousal-labeling model does account for some of the evidence, so does the social cognition view. In fact, some experiments cited by Patterson (1976; 1983a) as evidence for the arousal-labeling view have specifically mentioned the importance of person perception and have not discussed arousal at all.

For example, Jourard and Friedman (1970) asked a confederate to interview subjects at different distances ("distance" in this case was defined very generally, ranging

from being very silent and unresponsive to making physical contact with subjects). Self-disclosure by subjects was the dependent measure and it was hypothesized that compensation (less self-disclosure) should occur in more intimate conditions. But in these conditions subjects responded with an increase in self-disclosure (reciprocation) and this was accompanied by more positive impressions of the experimenter (e.g., greater liking, trust, understanding). Jourard and Friedman concluded that:

> We may propose that if an experimenter moves close, and the subject discovers that he likes and trusts him on such closer contact, he will respond by further decreasing the distance. If the subject does not like the experimenter, he may move back. In future research, the behavior of the experimenter toward the subject, and the subjects' perception of the experimenter, may have to be examined closely if we are to account for more variance in subjects' performance in the psychological laboratory" (p. 282).

A later experiment by Breed (1972) obtained similar results. A confederate varied her nonverbal behavior (body orientation, lean, eye-contact) in interactions with subjects to create three levels of immediacy. Subjects responded to greater immediacy with more positive attributions about the experimenter (person perception changes), more eye-contact, and a greater number of forward leans (nonverbal reciprocation).

Patterson (1976; 1983b) has cited these experiments and others (e.g., Mehrabian, 1969) as evidence for the arousal-

labeling model, assuming that the greater liking of the confederate was due to a positive labeling of the ambiguous arousal caused by the increased immediacy. It could very well be that social cognitive processes determined the label, instead of evaluative needs that arise from the presence of ambiguous, unexplained arousal.

A number of studies have found support for Burgoon's (1978) arousal-labeling model of the consequences of interpersonal distance violations (see Burgoon, 1983 for a review). For example, a number of characteristics of the violator have been found to have positive or negative consequences: physical attractiveness, smiling, head nods, high socio-economic status, positive feedback, and similarity in attitudes have all been found to affect the "reward value" of a person. When the violator is of positive reward value, he will receive more positive ratings of attractiveness, persuasiveness, credibility, and liking if he violates distance norms rather than if he conforms to them. When the violator is of negative reward value, he will receive more positive ratings if he does not violate distance norms. In addition, subjects' nonverbal behavior tends to correspond with their evaluations.

Another finding is that in a group including two persons of equally positive reward value, the individual who violates distance norms will be regarded more favorably than

the one who does not, and vice-versa for individuals of negative reward value.

Burgoon (1983) claims that this is evidence for the arousal-labeling model, but the findings are in accordance with the social cognition model as well. The inferences that individuals make about others are important determinants of their behavioral responses.

In sum, the findings of the research conducted so far are consistent with both the arousal-labeling and social cognition models. At this point, what is needed is a study that will enable us to determine which of the models is the correct one.

A Crucial Test of the Models

Testing the Social Cognition Model

A study was designed to test the social cognition model of reactions to increases in nonverbal immediacy. However, the experimental design provides more than just a test of the social cognition model; it should also have important implications for the arousal-labeling and discrepancy-arousal models. The design will be described, followed by an explanation of how it provides a test of the social cognition model. It will then be shown how the design can serve as a crucial test among the models.

The social cognition model assumes that individuals use their own implicit theories of social reality to assess what is happening in their environment and to respond accordingly. As such, the social cognition model would seem to be very difficult to test because each individual uses a relatively unique "implicit theory" (Wegner & Vallacher, 1977) or set of "constructs" (Kelley, 1955). However, there is one kind of social cognition which is common to everyone's "implicit theory" assessments. A fundamental assumption of attribution theory and research (Heider, 1958; Jones & Davis, 1965; Kelly, 1967) is that individuals attempt to determine whether or not another person's behavior was "consciously willed" or intended. This leads the individual to make attributions about the causes of the observed behavior and to make inferences about the intentions and personality characteristics of the other person. Making these attributions enables the individual to understand, predict, and control events in the environment. Heider claimed that this form of social cognition occurs every time the individual encounters something, whether he is aware of making these attributions or not. Causal attribution is the first step in making judgments about social behavior.

Because the causal attribution process is common to all implicit theory or social cognition-based assessments of the social environment, attribution theory can be used to test

among the models of nonverbal immediacy reactions. The following three experimental situations, based on attribution theory, can be used to do so: 1) in one condition a confederate intentionally violates subjects' interpersonal distance during a social interaction; 2) in another condition a confederate is forced to violate subjects' interpersonal distance due to the arrangement of the room; and 3) in a third condition the subject and confederate sit at a normal distance from one another. Attribution theory predicts that only subjects in the intentional-close condition should hold the confederate responsible for the violation. As a result, these subjects should make certain inferences (positive or negative, depending on the person and context) about the confederate's personality characteristics, intentions, emotions, etc., which the forced-close subjects should not. In other words, subjects in the intentional-close condition should evaluate the confederate differently than subjects in the forced-close and normal-distance conditions. There should be no difference between the evaluations of forced-close and normal-distance subjects. Past research has found that males respond to close interpersonal distances more negatively than females (e.g., Murphy-Berman & Berman, 1978). Therefore if male subjects and a male confederate are used, the subjects in the intentional-close condition should evaluate the confederate negatively whereas the other

subjects should not.

As for nonverbal immediacy behavior, if the intentional-close subjects evaluate the confederate more negatively then they should display nonverbal compensation. The subjects in the forced-close distance condition may or may not display nonverbal compensation. Past research has found that forced-close interpersonal distances between strangers can lead subjects to reduce the immediacy of their own nonverbal behavior (e.g., Coutts & Schneider, 1975; see Hayduk, 1983). That nonverbal compensation in forced-close conditions is likely to occur without the simultaneous occurrence of more negative judgments of the confederate does not contradict the social cognition model. Nonverbal compensation is expected in forced-close conditions because a socio-cultural norm (a schema) dictates that nonverbal compensation is the appropriate behavior (e.g., reducing your amount of eye-contact in elevators or crowded buses). Or perhaps in some situations individuals may not have adequate schemata for dealing with close distances and therefore automatically display nonverbal compensation. But more negative impressions of the other person should not occur in forced-close situations.

If the confederate is evaluated negatively in the intentional-close condition but not in the forced-close condition (compared to the control group), the implication

will be that social cognition determines whether nonverbal compensation or reciprocation will occur. This is because confirmation of the social cognition model predictions would indicate that subjects' liking or disliking of the other person is determined by the attributions that subjects made about the other person, based on his interpersonal distance behavior. There is abundant evidence indicating that, for example, an individual who likes another person will stand or sit closer to him or show more eye-contact (e.g., Allgeier & Byrne, 1973; Argyle, 1969; Barrios & Geisen, 1977; Bond, 1972; Byrne, Baskett & Hodges, 1971; Byrne, Ervin & Lamberth, 1970; Campbell, Kruskal, & Wallace, 1966; Coutts & Schneider, 1975; Evans & Howard, 1973; Exline & Winters, 1965; Goldberg, Kiesler, & Collins, 1969; Hayduk, 1983; King, 1964, 1966; Kleck, 1967, 1970; Little, 1965; Lott & Sommer, 1967; Mehrabian, 1968b; 1969; Mehrabian & Friar, 1969; Norum, Russo, & Sommer, 1968; Patterson, 1978b; Rubin, 1970; Sommer, 1965; Willis, 1966). If the predictions of the social cognition model are confirmed and are then combined with these past research findings, the conclusion will be that social cognition determines whether nonverbal reciprocation or nonverbal compensation will be the response to an increase in immediacy.

Implications for the Arousal Labeling Model

Confirmation of the predictions of the social cognition

model would create serious difficulties for the arousal-labeling model of nonverbal immediacy reactions. The findings would not question Schachter's original arousal-labeling theory of emotion. Rather, they would only question the extension of Schachter's model to nonverbal immediacy reactions.

One reason is that the findings would indicate that subjects' arousal was not "unexplained." In the Schachter and Singer (1962) study, subjects in the epinephrine-informed condition did not begin a label-search process because when they noticed that they were aroused they knew the drug was the cause. Similarly, confirmation of the social cognition model predictions would suggest that if and when the close-distance subjects became aroused, they too knew why. If the confederate is evaluated negatively in the intentional-close condition but not in the forced-close condition, the implication would be that subjects were quite sensitive to who was and who was not responsible for their arousal. In other words, their arousal would not have been "unexplained." The epistemic search process (Schachter & Singer, 1962) would not have been initiated.

Given that the arousal was not unexplained and that the epistemic search for a label did not commence, does the arousal-labeling model still apply? That is, could the arousal-labeling model still be a viable explanation of the

(predicted) findings? Could it be argued, for example, that subjects in the forced-close condition will say to themselves, "the experimenter put the chairs close together, my feelings of arousal are due to that, and so I will not attribute any negative qualities to the other person." In the intentional-close condition the subjects might view the confederate as responsible for the arousal and therefore attribute negative qualities to him.

There is no doubt that this kind of arousal-labeling probably happens, i.e., that subjects will say these things to themselves. But the question is whether this arousal-labeling determines their behavioral response. The answer (presuming that the predictions are supported) is that it does not. The reasons for this are as follows.

The arousal-labeling model is based on the assumption that the arousal comes first, then the individual searches for a label (Anderson, 1985; Patterson, 1976; 1978a). In a recent review, Hayduk (1983) wrote, "In response to a paper by Knowles (1977), Patterson (1978) acknowledged that there is insufficient evidence to determine the temporal ordering of arousal and labeling: the labels may arise before, simultaneously with, or after the arousal. Patterson was unclear as to how serious he considered such temporal ordering to be, but it seems that any sequence other than arousal then attribution makes his proposals unfeasible" (p.

305). The arousal-labeling model would not be feasible because if the attribution is made before the arousal, then it cannot be an attribution process stimulated by unexplained arousal that determines whether compensation or reciprocation will occur. It must be attributions alone.

Confirmation of the predictions made earlier would indicate that the attribution came first. By logical necessity, subjects must have noticed the intentional or forced aspect of the situation as it occurred: they could not have noticed it later, after it occurred. (Recent evidence shows that attributions are made spontaneously at the encoding stage instead of only later, when answering a questionaire --see Uleman, Winbourne, Winter, & Shecter, 1986; Weiner, 1985; Winter & Uleman, 1984). If the attribution comes first, then only attributions determine the response and not arousal-labeling.

Could it be that the key determining factor is still arousal-labeling, <u>regardless</u> of the temporal order of the arousal and the labeling? In other words, if subjects become aroused by the close-distances and they then immediately (and correctly) label their arousal, could it be this arousal-labeling that determines their response? This possibility would be based on the assumption that attributions about the forced or intentional aspect of the situation did indeed come first, but that these attributions

alone did not determine the behavioral response. The response was produced only after the individual became aroused: some combination of the attribution and the arousal was necessary for a behavioral response.

This is not likely. Although this kind of arousal-labeling probably does occur (e.g., "I am aroused because of -----."), it probably does not determine the response. The reason is based on two findings of past research. One finding is that the causal attributions that we make about other people affect our attraction to them. This comes from paper-and-pencil studies in which no interaction or arousal could have been involved (e.g. Dickoff, 1961; Goranson & Berkowitz, 1966; Jones & Baumeister, 1976; Jones, Jones, & Gergen, 1963; Lowe & Goldstein, 1970; Nemeth, 1970; Riordan, Marlin, & Kellogg, 1983; Schopler & Matthews, 1965; Shields, 1979; Steiner & Field, 1960; Tedeschi, Riordan, Gaes, & Kane, 1983; Thibault & Reicken, 1955; Wood & Mitchell, 1981). The subjects in these studies were merely given information about a hypothetical individual's behavior and the circumstances surrounding it. They were then asked to rate their liking for the actor in the story. Their liking was affected by the causal attributions that they made about his behavior. The second finding is that when an individual likes someone, he or she will stand or sit closer to the person or show more eye contact (see the references above). When these two findings are combined, the conclusion is that

causal attributions affect liking, which then affects behavior --no arousal is involved in this sequence.

This conclusion could only be extended to nonverbal immediacy reactions if there is evidence that individuals make causal attributions and corresponding evaluations of other people based on their interpersonal distance behavior. If there is such evidence, it could be argued that social cognition alone determines the individual's behavioral response and that arousal is not necessary. If the arousal is not a necessary component, then the arousal-labeling model does not apply.

In sum, confirmation of the predictions of the social cognition model would have the following implications for the arousal-labeling model: 1) that the arousal was not unexplained; 2) that the attribution was made before the arousal; and 3) that arousal is not a necessary component of nonverbal immediacy theories. This would seriously question the extension of the arousal-labeling model to nonverbal immediacy reactions. As a result, the arousal-labeling model would be forced to predict that subjects in both the intentional-close and the forced-close conditions should evaluate the confederate more negatively relative to subjects in the normal-distance condition.

Implications for the Discrepancy-Arousal Model

Confirmation of the predictions of the social cognition model would also raise serious questions about the discrepancy-arousal model. As mentioned above, this model predicts that large increases in arousal result in negative affect which in turn results in nonverbal compensation. Moderate increases in arousal are said result in positive affect and nonverbal reciprocation. Throughout the literature on nonverbal exchange, positive and negative impressions of others are presumed to be indications of positive and negative affect. The discrepancy-arousal model would have difficulty accounting for the finding that positive or negative affect (i.e., evaluations of the confederate) occurred in the intentional-close condition but not in the forced-close condition. The same interpersonal distance should have produced the same amount of arousal and therefore the same evaluation.

Could it be that there is a difference between evaluations (of the confederate) and negative affect (in contrast to the usual assumption of past research). For example, could it be that subjects in the forced-close condition will experience a great amount of arousal because the close distance is a strong violation of their interpersonal distance expectations for interactions between two strangers? This expectancy violation would then lead to negative affect, but it would not lead to negative evaluations of the confederate, because he was not

responsible for the close distance. Therefore, it might be claimed, the discrepancy-arousal model could account for the predicted findings.

But this would mean that evaluations of the other person are not important to how the individual responds, and that the amount of arousal is solely important. However, confirmation of the social cognition model predictions would indicate that the individual's liking or disliking of the other person is determined by what the individual thinks about the other person, based on the other's immediacy behavior. As mentioned above, past research has found that: 1) causal attributions can lead to changes in liking without the presence of arousal; and 2) when the individual likes another person he will move closer or increase his amount of eye-contact with the person. Obviously, the subjects in these latter studies could not have been aroused by the close distance or by the increased eye-contact before it occurred: positive perceptions alone determined the increase in immediacy. The discrepancy-arousal theorist would therefore be forced to attempt to argue the following: 1) in the latter studies arousal had nothing to do with increases in immediacy, and perceptions alone are important; but 2) when the individual is approached by another person his perceptions of the other are not important, only the amount of arousal is important. There is no logical basis for arguing this.

For these reasons, the discrepancy-arousal model would be forced to predict either: 1) that there should be no group differences in evaluations of the confederate; or 2) that subjects in both close distance conditions should evaluate the confederate more negatively relative to subjects in the normal distance condition.

In sum, confirmation of the predictions of the social cognition model would do more than provide evidence for this model. Confirmation would also raise serious questions about the arousal-labeling and discrepancy-arousal models. The reasons why this is so have been discussed. The design cannot serve as a crucial test among the models by itself. It can only serve as a crucial test when the predicted findings are considered along with a number of well established findings of past research. The next step is to examine the literature on personal space violations and impression formation in order to see if past research supports the predictions.

Evidence Concerning the Predictions

Is there any evidence in the literature that supports the predictions of the social cognition model? In other words, is there any evidence for the prediction that intentional personal space invasions lead to changes in impression formation whereas forced invasions do not? A number of studies have examined the effects of interpersonal distance

manipulations on impression formation, but the results are mixed. Some studies find more positive evaluations with decreases in distance (e.g., Carr & Dabbs, 1974; Hale & Burgoon, 1984; Kahn & McGaughey, 1977; Mehrabian, 1968b), some find no differences (Albert & Dabbs, 1970; Goldberg, Kiesler, & Collins, 1969; Grossnickle, Lao, Martoccia, Range, & Walters, 1975; Tesch, Huston, & Indenbaum, 1973) and some find more negative evaluations with closer distances (e.g., Fisher & Byrne, 1975; Patterson, 1968). Obviously, a decrease in interpersonal distance does not automatically produce greater liking or disliking.

A closer look at the designs of these studies reveals support for the social cognition model predictions. For example, Albert and Dabbs (1970) found no person perception differences between strangers who were forced to sit close together (due to the seating arrangement) and strangers who were seated farther apart. However in the Fisher and Byrne (1975) a confederate was viewed as less attractive when she invaded the personal space of subjects than when she did not. The confederates' behavior was probably seen as intentional and corresponding attributions and inferences were made. In contrast, subjects in the Albert and Dabbs experiment, whose personal space was not intentionally invaded, had no reason to begin a person perception search and therefore negative evaluations were not made. Fisher and Byrne discussed their results in terms of "the negative

affect invoked by spatial invasions" instead of simply talking about person perception differences. Note how their explanation cannot account for the results of the Albert and Dabbs study whereas the social cognition view can.

This same pattern of results also applies to other interpersonal distance studies. For example, Goldberg, Kiesler, and Collins (1969), Grossnickle, Lao, Martoccia, Range, and Walters (1975), Fisher (1974), Patterson (1967), and Tesch, Huston, and Indenbaum (1973) seated subjects at different distances from a confederate, based on the seating arrangement of the room, and found no person perception differences. On the other hand, Carr and Dabbs (1974), Greenberg and Firestone (1977), Kahn and McGaughey (1977), Mehrabian (1968b), Molberg (1977), Patterson (1968), Patterson and Sechrest (1970), Skolnick, Frasier, and Hadar (1977), and Smith and Knowles (1978; 1979) asked a confederate to intentionally approach subjects and found significant effects on person perception.

The research that has been conducted on Burgoon's (1978; 1983) arousal-labeling model has also focused on interpersonal distance violations. This research has focused on how individuals who differ in "reward value" (e.g., status, physical attractiveness) are perceived and responded to when they violate interpersonal distance norms. Intentional distance violations are used and person

perception differences are found (see Burgoon, 1983).

Murphy-Berman and Berman (1978) examined the effects of forced-close and intentional-close violations on impression formation. In one condition, a confederate was forced to sit close to subjects due to the arrangement of the room and instructions from the experimenter. In another condition, the confederate chose to sit close to the subjects at the start of the conversation. In a third condition, the confederate sat at a normal distance initially, but soon after intentionally moved close to the subjects. It was found that a male confederate was evaluated more negatively as the invasion appeared more intentional and personally directed. A female confederate was evaluated more positively as the invasion appeared more intentional and personally directed. These findings clearly support the predictions of the social cognition model. However in terms of the present interests, they are only suggestive because there was no normal distance condition. We do not know if a confederate at a normal distance would have been evaluated the same way as a confederate at the forced-close distance.

A study by Smith and Knowles (1979) is also relevant. They asked two confederates to approach solitary pedestrians who were waiting at a crosswalk for the light to turn green. One confederate invaded the subjects' personal space (by standing four inches away) while the other did not (five

feet). In another manipulation, one of the confederates appeared to be an artist (he held an artist's pad and was sketching additions to a partially complete drawing). The other confederate present did not appear to be an artist. Once the light turned green one of the confederates quickly began crossing the street in front of subjects and "accidentally and unknowingly" dropped a pen. Smith and Knowles measured: 1) how often subjects alerted the confederate to the dropped pen; 2) how fast subjects crossed the street; and 3) the subjects' self-reported mood and their perceptions of the invader, measured a few moments after the incident.

They found that a close, non-artist was perceived more negatively than a far non-artist, and that subjects in the close, non-artist condition reported feeling more uneasy than subjects in the far non-artist condition. This fits the social cognition model: intentional personal space violations lead to changes in person perception. Subjects also helped the close non-artist less than the far non-artist, and crossed the street faster when invaded by a close non-artist.

Smith and Knowles reasoned that if characteristics of the invader are important to spatial intrusions, then subjects should react differently when the invader is an artist. "It was assumed that this artist manipulation would make the

invasion more interpretable, less threatening, and more interesting. If cognitions and attributions mediate helping behavior and if the artist is more justified and acting less inappropriately than a non-artist invader, then the artist would be helped more than the non-artist" (p. 439-440). This proved to be true: the amount of help given to the close artist was not significantly different from the amount of help given to the far confederates. Furthermore, "the close artist was seen as acting as appropriately as the confederates standing far away and failed to produce the mood effect or the attribution of interpersonal intentions created by the close non-artist" (p. 449). These findings, according to Smith and Knowles (1979), support the attributional theory of reactions to spatial invasions.

Other findings, however, were judged to be inconsistent with this view. It was found that a spatial invasion, whether by an artist or non-artist, produced less help for another accomplice. That is, when subjects were given the opportunity to help another, innocent pedestrian (confederate) who had apparently dropped his pen, they helped this person less if their personal space had just been invaded. This finding seemed incongruous with the attributional explanation because the person who dropped their pen was not responsible for the personal space invasion, yet was still helped less.

With regards to the present concerns, it is possible that the invaded subjects helped the innocent confederate less because they misattributed their arousal to him (Smith & Knowles, 1979). This would support the arousal-labeling model. However confirmation of this possibility would require evidence that subjects evaluated this other pedestrian negatively as well. If subjects misattributed their arousal to this person, they should have helped him less because they perceived him more negatively. But the subjects in this study were only asked for their perceptions of the invader and not of the other pedestrian (accomplice). Therefore it cannot be determined if misattribution did occur.

In sum, the reduced helping of the innocent confederate implies that invaded subjects were probably disturbed or aroused by the close distance. But it is unclear why subjects helped the innocent person less. It could be the result of misattribution of arousal, or the result of the impact of negative feeling states on social behavior generally (Berkowitz, 1972; Clark & Isen, 1982). Another possibility is diffusion of responsibility (Latane, Nida, & Wilson, 1981). When a confederate invaded subjects' personal space by standing four inches away from them, the salience of this other person probably increased and subjects could have assumed that this close person should have alerted the other pedestrian to the dropped pen. This

is consistent with the finding that subjects' helping behavior was not related to their reported mood.

The results of two other interpersonal distance ("intensification") studies are counter to the predictions of the social cognition model. Schiffenbauer and Schaivo (1976) asked subjects to interact with a confederate. Subjects were first seated and then the experimenter told a confederate where to sit (close or far away). During the ensuing task the confederate gave the subjects either positive, negative, or neutral feedback about their performance. The confederate who gave positive feedback was liked more in the close condition than in the far condition. In the negative feedback condition the confederate was liked more in the far distance than at the close distance. One problem with this study, in terms of the present interests, is that it is possible that subjects thought that if the confederate was giving them such feedback (positive or negative) in an interpersonally stressful situation (close interpersonal distance), then the confederate must have really meant what he said. This could therefore account for the person perception results.

A study by Storms and Thomas (1977; Study 2) appears to provide further evidence against the social cognition view. In this experiment subjects were first seated at a table. In one condition there were two other chairs at the table (a

close chair and a far chair) and the experimenter sat either close or far away, apparently by choice. In another condition there was just one other chair at the table (close or far from the subject) and in this condition the experimenter seemed to have no choice as to where he sat. The experimenter's friendliness towards the subjects was also manipulated. In the friendly condition, the experimenter received more positive ratings when seated close rather than far away, regardless of choice. In the unfriendly condition, the experimenter was perceived more positively when seated farther away, also regardless of choice. (The choice-no choice manipulation was a minor independent variable and Storms and Thomas spent very little time discussing it. This is counter to the predictions of the social cognition model because both intentional-close and forced-close distances led to changes in evaluations of the experimenter.

But there are problems with this study as well. First, it seems quite possible that the no-choice condition, in which there was only one chair at the table, was actually a choice condition. Subjects may have correctly believed that the experimenter was the person who arranged the chairs in the room; or they may have believed that in the close/no-choice condition the experimenter could easily have moved his chair away if he really wanted to, since he was in command of the situation. In addition to these

complications, Storms and Thomas mention that the results "are potentially flawed by the unusually high number of suspicious subjects who were eliminated from the above analysis."

One final point regarding these "intensification" studies is that the presumed intensification effect is quite different from the arousal-labeling process. In these studies the arousal from the close distance was not misattributed to the confederate. It only intensified the subjects' normal reaction to being criticized or praised. No labeling process was involved. Evidence for this possibility comes from some of Schiffenbauer and Schaivo's (1976) own findings. Subjects who received neutral feedback from the confederate evaluated him the same regardless of the interpersonal distance.

Some results from the research on crowding also appear to contradict the predictions of the social cognition model. In these studies (e.g., Dooley, 1978; Walden & Forsyth, 1981; Worchel & Teddie, 1976; Worchel & Yohai, 1979) subjects interacted in small groups in rooms of different size. Subjects in small/crowded rooms perceived other subjects in the room with them more negatively. This seems to contradict the social cognition model because the difference in evaluations of others occurred when those others were not responsible for the close distances.

The problem with these crowding studies, however, is that subjects in the crowded conditions could very well have behaved more negatively towards each other (e.g., more signs of nervousness, defensiveness, etc.) and thus truly caused person perception differences. Indirect support for this possibility comes from studies by Aiello, DeRisi, Epstein, and Karlin (1977), Freedman, Lang, Buchanan, and Price (1972), and Epstein and Karlin (1975), who found that groups of female subjects perceived each other more positively when crowded than when not crowded, and vice-versa for males. Perhaps this is because females are more interpersonally oriented and responded more positively towards others in a stressful situation (crowding), whereas the males responded more negatively. It should also be mentioned that the crowded subjects in some other studies (Sherrod, 1974; Dabbs, 1971) showed no person perception differences as compared to non-crowded subjects.

What can one conclude from all of this research on the relation between interpersonal distance and impression formation? Although very few studies have systematically compared forced-close, intentional-close, and normal interpersonal distances as they affect person perception, the bulk of the research seems to support the social cognition model predictions. Interpersonal distance violations may be uncomfortable, but they probably only lead to negative evaluations of the other person when the other

person is perceived to be responsible for the violation. A few studies, however, have found that forced-close distances can lead to a change in perception as well. But there are alternate explanations of these findings, as mentioned above.

Another issue is that past studies have only measured attraction or other person perception dimensions, and not causal attributions as well. It is necessary to measure causal attributions because although the experimenter may construct a social situation that appears to be intentional-close or forced-close, it is the subjects' own perceptions or responsibility that are important (Fishbein & Ajzen, 1973). For example, subjects in a forced-close condition may not perceive the close distance to be intentional, but they may perceive it to be "forseeable" and could therefore attribute responsibility to the other person.

Furthermore, Bakken (1978) emphasized that the confederate's behavior in these studies must be very carefully controlled and this is rarely verified or reported. The confederate is usually trained and put through a number of practice trials, but the consistency of his or her behavior should be verified from videotapes as well. This is necessary because even confederates may be uncomfortable at close distances and may increase or decrease their immediacy on channels other than the one

manipulated (Bakken, 1978; Exline & Fehr, 1982). This inconsistent behavior could be responsible for the changes in subjects' impressions of them.

In sum, the conclusion reached by Hayduk (1983) seems most appropriate:

> Given the key status accorded "free will" in judgments of purposes, motives, and intentions, this would seem to be one aspect of personal space that is in dire need of further investigation. (p. 320)

Overview

The present study examined intentional-close, forced-close, and normal distance social interactions in order to test among the models of nonverbal immediacy reactions. A male confederate was paired with male subjects for brief conversations about a social dilemma.

This three-cell design was run twice. In one run, subjects gave their impressions of the confederate both before and after the distance manipulation (the "Pre-Post" design). In the other, the subjects gave their impressions of the confederate only after the distance manipulation (the "Post-Test" design). The purpose of the Pre-Post design was to examine the possibility that different amounts of change in impressions of the confederate occur in forced-close and intentional-close situations. The Post-Test design was used because it is more realistic.

It was predicted that subjects in the intentional-close condition would evaluate the confederate more negatively than will subjects in the forced-close and normal-distance conditions. There should be no difference between subjects' evaluations of the confederate in the forced-close and normal-distance conditions. This pattern of findings would support the social cognition model. For the reasons outlined above, the arousal-labeling model predicts that subjects in both the intentional-close and forced-close conditions should evaluate the confederate more negatively than subjects in the normal-distance condition. The discrepancy-arousal model predicts either: 1) that there should be no group differences in subjects' evaluations of the confederate; or 2) that subjects in both close distance conditions should evaluate the confederate more negatively than subjects in the normal distance condition.

It is also predicted that subjects in both close-distance conditions will display nonverbal compensation, compared to subjects in the control group. Nonverbal compensation rather than nonverbal reciprocation is expected because a male confederate was paired with male subjects. Nonverbal reciprocation is rarely found between strangers.

For a number of reasons, subjects' physiological arousal will not be measured. The main reason was that it would have made the experimental situation very unrealistic, and

the intentional-versus-forced close manipulations by the confederate in this study had to be convincing to the subjects. Furthermore, although arousal data would be of interest, they are not necessary because all three models (arousal-labeling, discrepancy-arousal, and social cognition) assert that arousal can occur in close-distance conditions. The arousal data would be desirable only because there might be arousal-level differences between the intentional-close and forced-close conditions. If so, this finding would tend to support the social cognition model because differences between these two conditions can only be the result of social cognition. However this interest in the arousal data was not strong enough to sacrifice the mundane reality of the social situation. Furthermore, past researchers have had difficulty establishing the base-line level of arousal for each subject (e.g., Worchel & Teddlie, 1976). A large number of subjects would be required to find a significant effect from a between-subjects design, and a within-subjects design (in which subjects would be in both intentional-close and forced-close conditions) could not be run in this case. Finally, there is little agreement as to what the different measures of arousal (GSR, SCL, heart rate, blood pressure, EEG, EMG) are actually tapping, and whether they are measuring the same thing (they do not correlate very highly -e.g., Johnson & Lubin, 1972; Lacey, 1972; see Leventhal, 1980, p. 149). For these reasons,

subjects' physiological arousal was not measured.

Method

Subjects

Subjects were 83 male volunteers (no course credit, no pay) drawn from undergraduate psychology courses. They were contacted by phone and agreed to participate in a study on "moral dilemmas."

Setting

All interactions took place in a 5 m by 6.7 m room that contained chairs, tables, a desk, pictures on the wall, and a bookcase that concealed a video camera. Subjects and the confederate sat in one corner of the room at a 60 degree angle from one another. There was no table or any other object between the subjects and the confederate. In the Normal-Distance condition, two chairs were arranged at 1.1 meters (3.5 feet) from one another (front corner to front corner), and a large table cornered the chairs in such a way that they could not be moved farther apart. In the Forced-Close condition, the chairs were pre-arranged at 0.26 m (ten inches) from one another and the large table was also positioned so that they could not be moved farther apart. In the Intentional-Close condition, the setting was, initially, the same as in the Normal-Distance condition. However, as the confederate sat down he picked up his chair and moved it to 0.26 m from the subjects' chair.

Procedure

Subjects arrived and were seated in an outer room where the experimenter had been waiting. Subjects were told that another subject should be coming soon. After one minute the confederate arrived, asking if he was in the right room and excusing himself for being late. The subject and confederate were introduced and were told that the study was concerned with what people thought of a particular moral dilemma, and how people go about solving this dilemma with someone else. At this point, the experimenter left to get some papers from a neighboring room and returned one minute later. This was to enable subjects to form a first impression of the confederate. During this period, the confederate always let the subjects initiate any small-talk. Upon return, the experimenter asked those subjects in the Pre-Post design to complete a "first impression" questionnaire (see below). They were then given the following moral dilemma to read:

> In Europe, a woman was near death from a very bad disease, a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what it cost him to make. He paid $200 for the radium and charged $2000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1000 which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money

> from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. Should he have done that? Why or why not? Would you have done the same if the dying person was a friend rather than a spouse? Why or why not?

After reading the dilemma, the subject and confederate were told that they were to talk it over to see if they agreed or disagreed as to what should be done in this situation. They were told that if they could not reach a concensus, then they should map out their reasons for disagreeing.

The experimenter then escorted the subjects and confederate to the laboratory room and directed them to the chairs. The subject always sat down first. In the Intentional-Close condition, the confederate casually picked the chair, which was 1.1 meters from the subjects' chair, and moved it to 0.26 meters away. This happened immediately after the experimenter left the room saying that he would return in two or three minutes. The confederate maintained the same body posture throughout the conversation: he sat still, with his hands in his lap, with his knees uncrossed, and with his trunk in a slight forward slump. He was also instructed to let the subjects initiate the amount of eye-contact: he did not initiate eye-contact if subjects did not initiate it. The confederate was not a psychology student and was blind to the hypotheses of the study.

After three minutes, the experimenter returned and asked them to complete a questionnaire (see below) in separate rooms. The confederate always "finished" his questionnaire first and left. When the subjects were finished, they were thoroughly debriefed. Six subjects reported either that the confederate was not a real subject and/or that the experiment was not about a moral dilemma but about interpersonal distance, etc. These subjects said that their suspiciousness affected their behavior and responses, therefore the data from these subjects was not included in the analyses. Videotapes of five of the interactions were not obtained due to technical or procedural problems. All subjects gave the experimenter permission to keep their videotapes and said that the experiment was interesting.

The Confederate's Behavior

During the interaction the confederate always let the subject lead the conversation. He did not take strong stands on the moral dilemma. He never evaluated subjects' opinions of the moral dilemma. He merely asked them questions about what they said. He was also instructed not to respond too strongly to smiles and similar behaviors on the part of subjects. The intention was to keep all interactions a little bit uncomfortable. When two people are introduced to one another and are immediately asked to work on a task or to discuss some issue together, it is

normal for them to be pleasant and to try to get along with one another. If the confederate had been instructed to "act normally" and to be as pleasant and easy-going as the subjects, then there would have been a risk of ceiling effects in subjects' evaluations of him (Coutts, Schneider, & Montgomery, 1980; Patterson, Jordan, Hogan, & Ferker, 1981).

In addition, the close-distance manipulations might not have been very salient if the confederate appeared to be just a normal person who was easy to get along with. It was hoped that the close-distance manipulations would be more salient by having the confederate act somewhat withdrawn and non-committal. The confederate himself found that acting this way made it easy for him to keep his behavior consistent across interactions.

Questionnaire

The first part of the questionnaire consisted of four cover questions about the moral dilemma. Subjects then evaluated the confederate on the following ten-point scales: aggressive-unaggressive; friendly-unfriendly; likeable-unlikeable. Subjects also indicated, on a ten point scale, how much they would enjoy being with the confederate in another experiment. The last two ratings are the social attraction scales from Byrne's (1970) Interpersonal Judgment Scale. The first two have also been frequently used in

interpersonal judgment tasks. Subjects in the Pre-Post design gave both their beforeand their after-discussion judgments on these four scales. The Pre-Post subjects did not give any other ratings before the discussion, as this could have made the procedure seem unrealistic.

The subjects were asked to describe how they felt during the discussion on the following ten-point scales: positive-negative; comfortable-uncomfortable; and aroused-drowsy.

Subjects were also asked to give their impression of the discussion room on the following scales: cramped-uncramped; pleasing-repulsive; and cheerful-depressing. There were no significant effects for these room judgments. Either subjects interpreted the question improperly, or the question was not worded correctly. The question asked subjects to indicate how cramped (and pleasant and cheerful) the room was. This phrasing could have directed subjects' attention to the room in general (which was quite big), instead of directing their attention to the seating arrangement. The room judgment results will therefore not be reported or discussed.

The last question asked subjects if they considered the confederate responsible for the close distance or not. This question could be answered either "yes," "no," or "can't tell."

Nonverbal Behaviors

The following nonverbal immediacy behaviors were coded by two observers from the videotapes: the amount of time spent in Mutual Gaze (Mutga); and the amount of Head Gaze while listening (Galst; this was found to correlate with affiliativeness by Argyle & Ingham, 1972).

Five other nonverbal immediacy behaviors (Seating Orientation, Legs Crossed, Knee Separation, Wrap, and Trunk Recline) were also coded. Legs Crossed, Knee Separation, Wrap, and Trunk recline were included as measures of "postural openness" (Anderson, 1985; Beier & Sternberg, 1977; Mehrabian, 1969; Morris, 1977).

The amount of time spent in three possible seating orientations (facing towards the other person, facing straight ahead, or facing away from the other person) was measured and a Seating Orientation score (Orient) was computed. This score was computed by converting each seating position score into a proportion score; multiplying these scores by a weighting factor; and then summing the three position scores to obtain a total score. The weighting factor for facing-towards-the-other-person was 3; the weight for facing-straight-ahead was 2; and the weight for facing-away-from-the-other-person was 1. The resulting Seating Orientation score is a proportion figure in which larger numbers indicate more time spent oriented towards the

other person. This same computation technique was used for Legs Crossed, Knee Separation, Wrap, and Trunk Recline.

The amount of time subjects spent with their legs in each of three possible crossed-uncrossed positions was measured: not crossed, foot-on-knee, and knee-on-knee. As above, a total Legs Crossed score (LgsCrs) was computed in which higher numbers indicate less leg-crossing.

The amount of time subjects spent in four different positions of knee separation was measured: knees tight together, knees slightly apart, knees apart (about one foot), and knees wide apart. As above, a total Knee Separation score (Knesep) was computed in which larger numbers indicate greater knee separation.

The amount of time subjects spent in four different positions of arm wrap was measured: hands not together, hands together, one hand on elbow or arm, and both hands on elbows or arms. Larger numbers in the total Wrap score indicate less arm wrap.

Finally, the amount of time subjects spent in four different positions of Trunk Recline was measured: backwards recline, straight, slightly forward, and elbows-on-knees. Higher Trunk Recline scores (Trnkre) indicate more backwards recline.

Two non-immediacy nonverbal behaviors were also coded from the videotapes: 1) the amount of time subjects spent rubbing or scratching themselves or objects (Manips); and 2) the number of postural shifts (Moves). These behaviors have been found to correlate with arousal and are often considered to be indications of arousal or anxiety (e.g., Burgoon & Aho, 1982; Ekman & Freisen, 1972; Hale & Burgoon, 1984; Kleck, 1970; Mahoney, 1974; Sundstrom, 1975).

Finally, the total amount of time which the subjects and confederate each spent talking (Talk) was measured.

Results

Manipulation Checks

Two manipulation checks were performed in order to determine whether the confederate behaved the same way in all conditions after the manipulation. One check consisted of having 39 additional subjects view the videotapes and make ratings of the confederate, based on his verbal and nonverbal behavior. Only 48 of the real subjects consented to have their videotapes viewed by other subjects, so the raters viewed only these tapes. These raters were run in groups of two to five, and each group (rater) viewed twelve videotapes. Raters saw what transpired after the confederate and the real subjects had sat down. They did not see the manipulation, as this could have affected their judgments of the confederate and the purpose of this manipulation-check was to verify whether the confederate behaved the same way after the manipulation. For each set of twelve tapes, the experimental conditions of the study were equally represented and the order of presentation was counterbalanced for different groups.

Raters were asked to indicate their impression of the confederate on the same adjective scales that the real subjects had used. No significant differences between experimental groups were found. None of the group contrasts were even close to significance [F values ranged from .04 to

.60, and p levels ranged from .62 to .99]. This implies that, according to independent observers, the confederate behaved the same way across experimental conditions.

The second manipulation check involved coding the confederate's verbal and nonverbal behavior from all of the videotapes. These behaviors (eight nonverbal immediacy behaviors and total time talking) were the ones described above. Only one contrast was significant. In the Post-Test design, the confederate talked more in the Forced-Close condition than in the other conditions [$F(3, 37) = 2.8$, $p = .05$]. An inspection of the total-time talking scores for each subject revealed that for two of the cases in the Forced-Close condition the confederate's total time talking was over three and four standard deviations above the mean. This was obvious from the videotapes as well. When these cases were deleted, the confederate time-talking effects were no longer significant [$F(3, 35) = 1.2$, $p = .33$]. These two cases were therefore deleted from the analyses. The findings of the study, however, were not affected by the exclusion of these two cases.

A third manipulation check was subjects' responses to the question, "Was the other person (the confederate) responsible for the seating distance during the discussion?" Subjects answered this question as would be expected:

subjects in the Normal-Distance and Forced-Close conditions said that the confederate was not responsible for the seating distance, whereas subjects in the Intentional-Close condition said that he was. However some subjects in the Intentional-Close condition responded, "No," meaning that the confederate was not responsible for the close seating distance.

This was unexpected because subjects were seated first and then the confederate picked up his chair and moved it close. In addition, the videotapes show most of these subjects actually looking at the confederate as he was moving his chair. Furthermore, the videotapes of these interactions were included in the two manipulation checks described above and no significant effects were found, i.e. the confederate did not behave differently for these subjects. The confederate's verbal and nonverbal behavior was the same for these subjects as for the others, and the ratings of independent judges were not different either.

Upon debriefing, all subjects were asked about the intentional-close behavior of the confederate and over half of these "not responsible" subjects were later contacted by phone for their reasons why they did not consider the confederate responsible for the close distance. Most of these subjects said that it didn't matter and that it seemed a normal thing to do in such a situation. Most said that

although the confederate moved his chair closer, they assumed that it was not his fault, that he must have thought that the room was inappropriately arranged or something. Because these reasons for the "not responsible" reply are unusual and contradictory, and because these subjects did not consciously attribute the intentional-close behavior to the confederate, their data were analyzed separately i.e. these subjects formed a fourth group in the analyses (the "Intentional-Not Responsible" group). There were ten of these cases in the Post-Test design and five in the Pre-Post design. These subjects did differ from the other subjects on some of the dependent variables. The reasons to be suggested for these differences later are of course very speculative.

Evaluations of the Confederate

A confederate evaluation scale composed of all four items was not very reliable (alpha = 0.69). However a scale composed of three of the items (likeable-unlikeable, friendly-unfriendly, and "Would you enjoy working with this person in another experiment?") was reliable (alpha = 0.86). The results from this overall Liking scale and from the Aggressiveness scale are therefore reported separately.

The hypotheses regarding subjects' evaluations of the confederate are a priori, nonorthogonal contrasts in which the directions of the group differences were specified

beforehand. In this case, multiple comparison procedures are inappropriate: simple, one-tailed T-tests were used (Howell, 1985). The group contrasts that were tested can be found in Table 1. The significant group comparisons for all analyses are referred to by their contrast numbers in the tables of results.

Aggressivenss Ratings. The confederate evaluation results from the Post-Test design, from the Pre-Post design, and from all subjects combined are reported in Tables 2 and 3. According to attribution theory, subjects in the Intentional-Close condition should have judged the confederate to be more aggressive than subjects in the other conditions. However this did not happen. Subjects in the Intentional-Close condition did not judge the confederate to be more aggressive than subjects in the Normal-Distance condition [$T(22) = -1.3$, $p = .10$ for the Post-Test design; T 20) $= -0.7$, $p = .26$ for the after-discussion Pre-Post ratings; and $T(44) = -1.4$, $p = .09$ for all subjects combined]; and they did not judge the confederate to be more aggressive than subjects in the Forced-Close condition [T 20) $= -0.7$, $p = .26$ for the Post-Test design; $T(20) = 0.3$, p $= .40$ for the Pre-Post design; and $T(42) = -0.4$, $p = .37$ for all subjects combined]. In fact, none of the pairwise contrasts were significant for this scale. When the before-discussion Aggressiveness judgments were compared to the after-discussion Aggressiveness judgments of subjects in the

Table 1

Pairwise Contrasts: referred to by their assigned number in the following tables.

Number:	Contrast			
	N-D	F-C	I-C	I-NR
1:	1	-1	0	0
2:	1	0	-1	0
3:	1	0	0	-1
4:	0	1	-1	0
5:	0	1	0	-1
6:	0	0	1	-1

"N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Table 2

Evaluations of the Confederate: means and standard deviations for all subjects combined and for the Post-test design.

All Subjects

		N-D n=24	F-C n=22	I-C n=22	I-NR n=15	signif. contrasts
Agr.	M	3.9	3.6	3.4	4.2	----
	SD	1.5	1.9	1.1	1.4	
Lik.	M	6.2	6.0	5.4	5.1	2 3 4 5
	SD	1.3	1.3	0.8	1.5	

Post-Test Design

		N-D n=13	F-C n=11	I-C n=11	I-NR n=10	signif. contrasts
Agr.	M	4.0	3.9	3.4	4.1	----
	SD	1.4	2.2	0.9	1.3	
Lik.	M	6.6	6.4	5.6	5.3	2 3 4 5
	SD	1.1	0.8	0.6	1.0	

Higher means indicate higher ratings. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Table 3
Pre-Post Design Confederate Evaluations: means and standard deviations.

		N-D n=11	F-C n=11	I-C n=11	I-NR n=5	signif. contrasts
First Judgment:						
Agr.	M	4.0	3.4	3.8	3.4	----
	SD	0.9	1.7	1.1	0.9	
Second Judgment:						
Agr.	M	3.8	3.3	3.4	4.2	----
	SD	1.6	1.5	1.3	1.7	
	p <	n.s.	n.s.	n.s.	n.s.	
First Judgment:						
Lik.	M	5.7	5.4	5.9	5.1	----
	SD	0.9	1.1	1.0	2.1	
Second Judgment:						
Lik.	M	5.7	5.4	5.3	4.8	----
	SD	0.9	1.1	0.9	2.4	
	p =	n.s.	n.s.	0.001	n.s.	

Higher means indicates higher ratings. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Pre-Post design, no significant differences emerged either.

Upon debriefing, almost all subjects reported that "the other person" was too quiet during the discussion. Perhaps the non-significant Aggressiveness findings represent a ceiling effect.

Liking Ratings. There were significant group differences in the Liking ratings for all subjects combined and for the Post-Test design, but not for the Pre-Post design. These significant effects were all in accord with the predictions of the social cognition model. Subjects in the Forced-Close condition did not like the confederate less than subjects in the Normal-Distance condition [$T(44) = -0.4$, $p = .34$ for all subjects combined; $T(22) = -0.6$, $p = .27$ for the Post-Test design; and $T(20) = 0.3$, $p = .49$ for the Pre-Post design]. On the other hand, subjects in the Intentional-Close condition liked the confederate less than subjects in the Normal-Distance condition [$T(44) = -2.7$, $p = .005$ for all subjects combined; $T(22) = -3.5$, $p = .002$ for the Post-Test design; and $T(20) = -0.7$, $p = .25$ for the Pre-Post design]. Intentional-Close subjects also liked the confederate less than subjects in the Forced-Close condition [$T(42) = -2.0$, $p = .03$ for all subjects combined; $T(20) = -2.9$, $p = .017$ for the Post-Test design; and $T(20) = -0.6$, $p = .29$ for the Pre-Post design].

Although none of the group contrasts for Liking were significant in the Pre-Post design, there were before-after discussion differences in Liking for the confederate. These differences were also in accord with the social cognition model predictions. There was no before-after difference in the Liking judgments of Normal-Distance subjects [$\underline{T}(10) = 0.9$, $\underline{p} = .46$] or in the Liking judgments of Forced-Close condition subjects [$\underline{T}(10) = -1.14$, $\underline{p} = .14$]. However subjects in the Intentional-Close condition liked the confederate less after the discussion than before the discussion [$\underline{T}(10) = 4.9$, $\underline{p} = .001$].

The Liking ratings of subjects in the Intentional-Not Responsible group were very similar to the ratings of subjects in the Intentional-Close condition. These subjects liked the confederate less than Normal-Distance subjects [$\underline{T}$ 37) $= -2.3$, $\underline{p} = .016$ for all subjects combined; $\underline{T}(21) = -3.1$, $\underline{p} = .003$ for the Post-Test design; and $\underline{T}(14) = -1.1$, $\underline{p} = .13$ for the Pre-Post design]. They also liked the confederate less than subjects in the Forced-Close condition [$\underline{T}(35) = -1.9$, $\underline{p} = .034$ for all subjects combined; $\underline{T}(19) = -2.9$, $\underline{p} = .01$ for the Post-Test Design; and $\underline{T}(14) = -0.8$, $\underline{p} = .20$ for the Pre-Post design]. Their Liking ratings did not differ from those of Intentional-Close subjects [$\underline{T}(35) = -0.5$, $\underline{p} = .38$ for all subjects combined; $\underline{T}(19) = -0.2$, $\underline{p} = .67$ for the Post-Test design; and $\underline{T}(14) = -0.5$, $\underline{p} = .32$ for the Pre-Post design]. However unlike Intentional-Close

subjects, there was no before-after difference in Liking for these subjects in the Pre-Post design [$T(4) = 0.34$, $p = .38$], although the means were in the same direction as the Intentional-Close means.

In sum, subjects' evaluations of the confederate were not consistently different in both designs and for both judgment scales. But the significant findings that did emerge are all in accord with the social cognition model predictions.

Nonverbal Immediacy Behaviors

The hypotheses regarding subjects' nonverbal behaviors represent a priori contrasts; the directions of the group differences were specified beforehand. Subjects in the two close-distance conditions were expected to display less immediate nonverbal behavior compared to subjects in the Normal-Distance condition. Because the direction of the group differences was specified beforehand, the significance levels reported below are based on one-tailed tests. T tests were used since there was not enough subjects for a proper multivariate analysis of variance. (Multivariate analyses were run anyway and the results were almost identical.) The interobserver correlations for the behaviors were quite satisfactory (see Table 4). The intercorrelation matrix for these behaviors can be found in Table 5. Apart from the intercorrelations among the gaze variables, the interbehavior correlations were generally

quite small.

The means, standard deviations, and significant contrasts for the Post-Test design, the Pre-Post design, and for all subjects combined can be found in Tables 6, 7, and 8, respectively. Subjects in all three close-distance conditions, in both the Post-Test and Pre-Post designs, displayed less immediate nonverbal behavior relative to subjects in the Normal-Distance condition. This effect was most clear-cut for the gaze variables and for Seating Orientation.

Subjects in the Normal-Distance condition displayed more Mutual Gaze than subjects in the Forced close condition [$\underline{T}$ 18) = 2.8, $\underline{p}$ = .007 for the Post-Test design; $\underline{T}$(20) = 2.3, $\underline{p}$ = .02 for the Pre-Post design; and $\underline{T}$(40) = 3.6, $\underline{p}$ = .001 for all subjects combined], more Mutual Gaze than subjects in the Intentional-Close condition [$\underline{T}$(19) = 4.4, $p < 0.001$ for the Post-Test design; $\underline{T}$(20) = 2.6, $\underline{p}$ = .008 for the Pre-Post design; and $\underline{T}$(41) = 4.7, 0.001 for all subjects combined]; and more Mutual Gaze than subjects in the Intentional-Not Responsible group [$\underline{T}$(19) = 1.8, $\underline{p}$ = .047 for the Post-Test design; $\underline{T}$(14) = 2.7, $\underline{p}$ = .009 for the Pre-Post design; and $\underline{T}$ 35) = 4.7, $\underline{p} < .001$ for all subjects combined].

The Gaze-While-Listening group differences were very similar to the Mutual Gaze differences, except that the contrasts were only marginally significant for the Pre-Post

Table 4

Interobserver Pearson correlations for the nonverbal and verbal behaviors

Mutga	0.86	Wrap	0.92
Galst	0.92	TrnkRe	0.99
Lgscrs	0.99	Talk	0.86
Orient	0.99	Manips	0.98
Knesep	0.99	Moves	0.90

Table 5

Inter-Behavior Pearson correlation

	1	2	3	4	5	6	7	8	9
Mutga.	---								
Galst.	.42								
LgCrs.	-.03	.12							
Orient.	.32	.18	.11						
Kneesep.	.16	-.01	.20	.37					
Wrap	.01	-.09	.30	.16	.09				
TrunkRe.	.12	.04	-.38	-.03	-.05	-.33			
TTalk.	.28	-.07	.06	.12	.18	.13	-.05		
Manips.	-.10	.06	-.05	-.16	-.06	.00	-.13	-.13	
Moves	-.25	-.23	.09	-.10	-.13	.05	-.15	.10	-.12

Table 6

Post-Test Design Nonverbal Immediacy Behaviors: Means and Standard Deviations

		N-D n=11	F-C n=9	I-C n=10	I-NR n=10	signif. contrasts
Mutga.	M	.16	.05	.04	.09	1 2 3
	SD	.08	.08	.03	.09	
Galst.	M	.52	.21	.26	.27	1 2 3
	SD	.21	.23	.14	.28	
LgCrs.	M	.92	.82	.90	.91	----
	SD	.14	.14	.16	.15	
Orient.	M	.67	.41	.53	.47	1 2 3
	SD	.21	.15	.17	.17	
Knesep.	M	.81	.72	.71	.75	1 2
	SD	.15	.10	.09	.02	
Wrap.	M	.74	.75	.81	.78	----
	SD	.13	.16	.12	.15	
TrnkRe.	M	.62	.68	.57	.59	----
	SD	.22	.34	.24	.19	

The means are proportions; higher numbers indicate more immediate nonverbal behavior. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Table 7

Pre-Post Design Nonverbal Immediacy Behaviors: Means and Standard Deviations

		N-D n=11	F-C n=11	I-C n=11	I-NR n=5	signif. contrasts
Mutga.	M	.16	.09	.07	.07	1 2 3
	SD	.10	.04	.07	.04	
Galst.	M	.37	.36	.28	.31	----
	SD	.15	.14	.09	.05	
LgCrs.	M	.87	.86	.94	.98	3
	SD	.16	.23	.14	.05	
Orient.	M	.67	.42	.52	.67	1 2 5
	SD	.21	.15	.17	.24	
Knesep.	M	.77	.55	.73	.65	1 4
	SD	.08	.21	.19	.14	
Wrap.	M	.74	.75	.69	.76	----
	SD	.27	.19	.22	.09	
TrnkRe.	M	.64	.72	.59	.53	5
	SD	.29	.26	.26	.04	

The means are proportions; higher numbers indicate more immediate nonverbal behavior. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Table 8

Nonverbal Immediacy Behaviors: Means and Standard Deviations for all subjects combined

		N-D n=22	F-C n=20	I-C n=21	I-NR n=15	signif. contrasts
Mutga.	M	.16	.07	.05	.08	1 2 3
	SD	.09	.06	.06	.08	
Galst.	M	.50	.28	.29	.26	1 2 3
	SD	.25	.23	.16	.26	
LgCrs.	M	.89	.84	.92	.93	----
	SD	.15	.19	.15	.13	
Orient.	M	.67	.42	.53	.53	1 2 3 4
	SD	.21	.15	.17	.21	
Knesep.	M	.79	.64	.72	.71	1 2 3 4
	SD	.12	.18	.14	.09	
Wrap.	M	.74	.75	.74	.77	----
	SD	.21	.17	.19	.13	
TrnkRe.	M	.63	.71	.58	.57	----
	SD	.25	.29	.25	.15	

The numbers are proportions; higher means indicate more immediate nonverbal behavior. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Table 9

Total Time Talking: Means and standard deviations

	N-D	F-C	I-C	I-NR	signif. contrasts
All Subjects					
M	.43	.47	.38	.49	----
SD	.15	.13	.18	.14	
Post-Test Design					
M	.44	.43	.38	.47	----
SD	.16	.10	.21	.12	
Pre-Post Design					
M	.43	.50	.38	.57	----
SD	.14	.14	.15	.22	

The means are proportions; higher numbers indicate more time talking. "N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

the Post-Test design; and $\underline{T}(14) = 0.0$, $\underline{p} = 1.0$ for the Pre-Post design]. Furthermore, the close-distance subjects oriented themselves away from the confederate as he sat down. Only one subject actually changed his seating orientation during the conversation. This implies that they were quite sensitive to the interpersonal distance: they began compensating for it almost before it began.

The group differences for Knee Separation were also in general accordance with predictions. However, the findings were not consistently significant. Subjects in the Normal-Distance condition displayed more Knee Separation than subjects in the Forced-Close condition [$\underline{T}(40) = 3.0$, $p = 0.003$ for all subjects combined; $\underline{T}(18) = 1.6$, $\underline{p} = .06$ for the Post-Test design; and $\underline{T}(20) = 2.9$, $\underline{p} = .01$ for the Pre-Post design]; more Knee Separation than subjects in the Intentional-Close condition [$\underline{T}(41) = 1.7$, $\underline{p} = .042$ for all subjects combined; $\underline{T}(19) = 1.8$, $\underline{p} = .046$ for the Post-Test design; and $\underline{T}(20) = 0.8$, $\underline{p} = .23$ for the Pre-Post design]; and more Knee Separation than subjects in the Intentional-Not Responsible group [$\underline{T}(35) = 2.3$, $\underline{p} = .016$ for all subjects combined; $\underline{T}(19) = 1.3$, $\underline{p} = .11$ for the Post-Test design; and $\underline{T}(14) = 1.9$, $\underline{p} = .06$ for the Pre-Post design].

There were generally no significant group differences for Wrap, Legs Crossed, or for Trunk Recline. There were also no group differences for Total Time Talking (see Table 11),

which is not a nonverbal immediacy behavior.

Overall, the results from the nonverbal immediacy behaviors show that subjects in all three close-distance groups displayed nonverbal compensation.

Self-Reported Feelings

According to the arousal-labeling model of nonverbal immediacy reactions, the arousal created by close interpersonal distances must be "noticeable" for the label-search process to begin and for nonverbal reciprocation or nonverbal compensation to occur. Similarly, the discrepancy-arousal model hypothesizes that nonverbal compensation is the result of high levels of arousal. Since both groups of close-distance subjects did display nonverbal compensation they should have reported feeling more "aroused," according to these models. Instead (see Table 10), there was a tendency for subjects in the Forced-Close condition to report feeling less Aroused than Normal-Distance subjects [$\underline{T}(22) = -2.5$, $\underline{p} = .011$ for the Post-Test design; $\underline{T}(44) = -1.6$, $\underline{p} = .06$ for all subjects combined; $\underline{T}$ 20) $= -0.03$, $\underline{p} = .48$ for the Pre-Post design]. Similarly, subjects in the Intentional-Close condition also reported feeling less Aroused than subjects in the Normal-Distance condition [$\underline{T}(44) = -3.0$, $\underline{p} = .002$ for all subjects combined; $\underline{T}(22) = -3.3$, $\underline{p} = .001$ for the Post-Test design; and $\underline{T}(20) = -1.1$, $\underline{p} = .15$ for the Pre-Post design]. These self-report

Table 10

Self-reported feelings: means and standard deviations.

		N-D	F-C	I-C	I-NR	signif. contrasts
All Subjects						
Pos.	M	6.1	6.5	5.6	6.3	4
	SD	1.5	1.0	1.3	1.0	
Comf.	M	5.3	5.9	5.1	4.8	----
	SD	1.6	1.4	1.5	1.8	
Arous.	M	5.8	5.2	4.6	5.3	2
	SD	1.2	1.1	1.5	1.6	
Post-Test Design						
Pos.	M	6.4	6.6	5.6	6.7	4 6
	SD	1.7	1.1	0.7	0.9	
Comf.	M	5.3	5.8	5.3	5.1	----
	SD	1.6	1.3	1.6	1.9	
Arous.	M	6.1	5.1	4.4	5.5	1 2
	SD	1.1	0.9	1.2	1.7	
Pre-Post Subjects Design						
Pos.	M	5.7	6.5	5.6	5.7	1
	SD	1.1	1.0	1.7	0.8	
Comf.	M	5.3	5.9	4.9	4.2	----
	SD	1.6	1.6	1.0	1.8	
Arous.	M	5.4	5.4	4.7	4.9	----
	SD	1.1	1.4	1.7	1.5	

Higher means indicate higher ratings.

arousal results not only do not support, but are the reverse of what arousal theorists would predict.

Subjects' ratings of how Positive and Comfortable they felt are important to the discrepancy-arousal model. According to this model, nonverbal compensation is the result of high levels of arousal, which is presumed to be unpleasant. But although subjects in the Forced-Close condition displayed nonverbal compensation, they did not report feeling less Positive than subjects in the Normal-Distance condition [$\underline{T}(44) = 1.2$, $\underline{p} = .12$ for all subjects combined; $\underline{T}(22) = 0.3$, $\underline{p} = .38$ for the Post-Test design; and $\underline{T}(20) = 1.8$, $\underline{p} = .045$ for the Pre-Post design], nor did they report feeling less Comfortable than the Normal-Distance subjects [$\underline{T}(44) = 1.4$, $\underline{p} = .08$ for all subjects combined; $\underline{T}$ 22) = 1.0, $\underline{p}$ =.17 for the Post-Test design; and $\underline{T}(20) = 1.0$, $\underline{p} = .17$ for the Pre-Post design]. Similarly, although subjects in the Intentional-Close condition displayed nonverbal compensation, they did not report feeling less Positive than subjects in the Normal-Distance condition [$\underline{T}$ 44) = -1.2, $\underline{p} = .13$ for all subjects combined; $\underline{T}(22) = -1.6$, $\underline{p} = .07$ for the Post-Test design; and $\underline{T}(20) = 1.1$, $\underline{p} = .46$ for the Pre-Post design], nor did they report feeling less Comfortable than subjects in the Normal-Distance condition [$\underline{T}(44) = -0.4$, $\underline{p} = .35$ for all subjects combined; $\underline{T}(22) =$ 0.03, $\underline{p} = .49$ for the Post-Test design; and $\underline{T}(20) = -0.6$, $\underline{p}$ = .29 for the Pre-Post design].

The same was true for the Intentional Not-Responsible subjects. They displayed less immediate nonverbal behavior but did not report feeling less Postive the subjects in the Normal-Distance condition [$\underline{T}(37) = 0.7$, $\underline{p} = .25$ for all subjects combined; $\underline{T}(21) = 0.5$, $\underline{p} = .31$ for the Post-Test design; and $\underline{T}(14) = -0.06$, $\underline{p} = .47$ for the Pre-Post design], nor did they report feeling less Comfortable than subjects in the Normal-Distance condition [$\underline{T}(37) = 0.9$, $\underline{p} = .19$ for all subjects combined; $\underline{T}(21) = -0.2$, $\underline{p} = .40$ for the Post-Test desing; and $\underline{T}(14) = -1.2$, $\underline{p} = .13$ for the Pre-Post design]. Interestingly, subjects in the Intentional Not-Responsible group reported feeling less Positive than subjects in the Forced-Close condition [$\underline{T}(42) = -2.5$, $\underline{p} = .016$ for all subjects combined; $\underline{T}(20) = -2.5$, $\underline{p} = .022$ for the Post-Test design; and $\underline{T}(20) = 1.0$, $\underline{p} = .17$ for the Pre-Post design]. Subjects in the Intentional Not-Responsible Group also reported feeling less Positive than subjects in the Intentional-Close condition [$\underline{T}(35) = 1.8$, $\underline{p} = .079$ for all subjects combined; $\underline{T}(19) = 3.1$, $\underline{p} = .007$ for the Post-Test design; and $\underline{T}(14) = -0.09$, $\underline{p} = .038$ for the Pre-Post design].

Nonverbal Arousal Behaviors

There were significant group differences in the non-immediacy, "arousal" nonverbal behaviors (time spent in self or object manipulation and number of postural moves or

readjustments. These results are displayed in Table 11. However, these significant effects were restricted to subjects in the Post-Test design. Subjects in the Forced-Close condition had higher Manipulation scores than Normal-Distance subjects [$\underline{T}(40) = -2.0$, $\underline{p} = .025$ for all subjects combined; $\underline{T}(18) = -2.2$, $\underline{p} = .025$ for the Post-Test design; and $\underline{T}(20) = -0.9$, $\underline{p} = .19$ for the Pre-Post design]. Similarly, subjects in the Intentional-Close condition had higher Manipulation scores than subjects in the Normal-Distance condition [$\underline{T}(41) = -1.8$, $\underline{p} = .036$ for all subjects combined; $\underline{T}(19) = -3.2$, $\underline{p} = .003$ for the Post-Test design; and $\underline{T}(20) = -0.1$, $\underline{p} = .47$ for the Pre-Post Design].

None of the group comparisons for Postural Moves involving the Forced-Close and Intentional-Close subjects were significant. However, subjects in the Intentional-Not Responsible group had higher Move scores than Normal-Distance subjects [$\underline{T}(35) = -2.0$, $\underline{p} = .028$ for all subjects combined; $\underline{T}(19) = -1.6$, $\underline{p} = .06$ for the Post-Test design; and $\underline{T}(14) = -0.9$, $\underline{p} = .21$ for the Pre-Post design].

In sum, there was a tendency for subjects in the close-distance conditions to show more signs of increased arousal than subjects in the Normal-Distance condition.

Table 11

Nonverbal Arousal Behaviors: Means and standardizations.

		N-D	F-C	I-C	I-NR	signif. contrasts
All Subjects						
Manips.	M	.32	.49	.47	.29	1 2 5 6
	SD	.30	.25	.24	.19	
Moves.	M	.03	.04	.05	.04	3
	SD	.02	.01	.02	.02	
Post-Test Design						
Manips.	M	.22	.43	.52	.33	1 2 6
	SD	.17	.25	.25	.20	
Moves.	M	.03	.04	.04	.05	3
	SD	.02	.02	.02	.02	
Pre-Post Design						
Manips.	M	.42	.54	.43	.20	5 6
	SD	.37	.25	.24	.19	
Moves.	M	.03	.04	.05	.04	----
	SD	.02	.01	.02	.02	

"N-D" stands for the Normal-Distance condition; "F-C" stands for the Forced-Close condition; "I-C" stands for the Intentional-Close condition; and "I-NR" stands for the Intentional Not-Repsonsible group.

Discussion

Evaluations of the Confederate. The results clearly support the social cognition model of reactions to increases in nonverbal immediacy. The key finding that the confederate was evaluated negatively in the Intentional-Close condition but not in the Forced-Close condition (compared to the control group), implies that social cognition determines whether nonverbal compensation or reciprocation will occur. The results show that subjects' liking or disliking of the other person is determined by the attributions that they made about him based on his interpersonal distance behavior. When these findings are combined with past research findings that individuals who like others will stand or sit closer to them, the conclusion is that social cognition determines whether nonverbal reciprocation or nonverbal compensation will be the response to an increase in immediacy.

The findings also raise serious questions about the extension of the arousal-labeling theory of emotion (Schachter & Singer, 1962) to nonverbal immediacy reactions (Anderson, 1985; Burgoon, 1983; Patterson, 1976). That the confederate was evaluated negatively in the Intentional-Close condition but not in the Forced-Close condition implies that subjects were quite sensitive to who was and who was not responsible for their arousal. In other words,

their arousal was not "unexplained." It can therefore be argued that the epistemic search process (Schachter & Singer, 1962) was not initiated.

Because the arousal was not unexplained and the epistemic search for a label did not begin, the arousal-labeling model does not accurately characterize the process of responding to nonverbal immediacy changes. The findings indicate that the attribution could not have come after the arousal. By logical necessity, subjects must have noticed the intentional or forced aspect of the situation as it occurred: they could not have noticed it later, after it occurred. The fact that the attribution must have come before, or at the same time as, the arousal implies that it is not an attribution process stimulated by unexplained arousal that determined the behavioral response. It is only attributions.

Furthermore, it cannot be argued that some combination of attribution and arousal is necessary for a behavioral response. Past research (paper and pencil studies) has found that the causal attributions we make about other peoples' behavior affect our attraction to them (see the references above). Past research has also found that when the individual likes someone, he will stand or sit closer to the person or show more eye contact. When these two findings are combined, the conclusion is that causal

attributions affect liking, which then affects behavior --no arousal is involved. This conclusion can now be extended to nonverbal immediacy reactions because of the evidence that individuals make causal attributions and corresponding evaluations of other people based on their interpersonal distance behavior. This implies that social cognition alone determines the individual's behavioral response and that arousal is not necessary. If the arousal is not a necessary component, then the arousal-labeling model does not apply.

The findings also raise serious questions about the discrepency-arousal model, for the reasons mentioned above. The discrepancy-arousal model cannot account for the finding that positive or negative affect (i.e., evaluations of the confederate) occurred in the Intentional-Close condition but not in the Forced-Close condition. The same interpersonal distance should have produced the same amount of arousal and the same evaluations of the confederate, especially since nonverbal compensation was displayed in both close-distance conditions.

Self-Reported Feelings. Apart from subjects evaluations of the confederate, other findings of this study also question the arousal-based models of nonverbal immediacy reactions. One finding is the tendency for subjects in the close-distance conditions to report feeling less aroused than subjects in the normal-distance condition. These self-

report findings contradict the nonverbal indicators of arousal and discomfort. Subjects in the close-distance conditions spent more time in self or object manipulation, an indication of arousal and they displayed nonverbal compensation (an indication of discomfort: see Burgoon & Aho, 1982; Ekman & Freisen, 1972; Hale & Burgoon, 1984; Kleck, 1970; Mahoney, 1974; Sundstrom, 1975). This discrepancy between the nonverbal indications of their feeling states and the self-reported feelings suggests that the subjects did not accurately perceive their own emotional states. According to arousal-labeling theorists (Anderson, 1985; Patterson, 1976, p. 242) accurate perception of one's arousal is necessary for the arousal-labeling process to begin.

This finding is also a problem for the discrepancy-arousal model. According to Capella and Greene (1982), nonverbal compensation occurs when arousal levels are very high. But although the subjects in this study displayed nonverbal compensation, they did not report feeling more aroused during the discussion. Furthermore, the discrepancy-arousal model states that high levels of arousal are aversive. Therefore since the close-distance subjects displayed nonverbal compensation, they should have also reported feeling less comfortable and less positive than the normal-distance subjects. But there were no significant effects for the Positive and Comfortable ratings.

Inspection of the group means revealed that close-distance subjects reported feeling more positive and more comfortable than normal-distance subjects. These findings are in direct contrast to what the discrepancy-arousal model predicts.

The Intentional-Not Responsible Group

The significant findings which emerged regarding the intentional-not responsible subjects form something of a pattern. That these subjects liked the confederate less than normal-distance and Forced-Close subjects did would seem to contradict their debriefing statements that the confederate was not responsible for the close seating distance. If they really did not consider him responsible for the close distance, then their impressions of him should not have been more negative. But their judgments of him were apparently affected by his Intentional-Close behavior. This could be an indication of social cognitive processes occurring outside of awareness (Bargh & Pietromonaco, 1982; Nisbett & Wilson, 1977).

The tendency for subjects in the Intentional-Not Responsible group to report feeling more positive than subjects in the Intentional-Close condition is also interesting. Taken by itself, this finding would seem to indicate that the intentional-close manipulation was not successful for these subjects: they didn't notice it. But the more negative confederate evaluations, in combination

with the more positive self-reported feelings, suggests that the "not-responsible" perception could have been a kind of defensive act. The other person (i.e., the confederate) was behaving oddly and these subjects did not know how to deal with him: therefore, to avoid a negative feeling state, they consciously attributed his intentional-close behavior to the environment. Their overall impression of him, however, was determined by what actually happened. As mentioned above, these suggestions are necessarily speculative. More research is needed to clarify what is actually occurring with these subjects.

Limitations of this Study

Pre-Post vs. Post-Test Differences in Results. Different findings emerged from the Pre-Post and Post-Test designs in this study. This is not unexpected. According to a review by Grice (1966),

> subject who has served as his own control may not be the same subject that he would have been if he had not. If the experience in the control condition in any way influences performance in the experimental condition, then a different result may be obtained than if separate groups had been employed. Such an experiment may be good or bad, but if the experimenter thinks that he has merely done, more efficiently, the same investigation as the independent group experiment, he is mistaken (p. 488).

In the present case, the before-discussion judgment task probably influenced how the same judgments were made after the discussion. The first judgments probably served as an

"anchor" for the second judgments (Quattrone, 1982; Tversky & Kahneman, 1974). When subjects were asked to give their first impression of the confederate, after having just met him, they were probably sensitized to the fact that the experiment was about impressions of others. The lack of group differences in post-discussion ratings may be due to evaluation apprehension (Rosenberg, 1965) or impression management concerns (Schlenker, 1980). The situation was ambiguous and perhaps subjects "played it safe" by giving roughly the same ratings as they did the first time. The before-after difference in Liking for subjects in the Intentional-Close condition was significant, as predicted, but only because it is based on a related samples T-test. The small but significant change effect for these subjects is probably an indication of their true feelings.

Self-Reported Arousal. The self-reported arousal results were unexpected. Research on crowding has frequently found that crowded subjects report feeling more aroused than non-crowded subjects. Similarly, nonverbal compensation is often considered to be an indication of arousal and discomfort. Yet there was a tendency for the close-distance subjects to report feeling less aroused than normal-distance subjects. This is in contradiction to the self-and-object manipulation and nonverbal immediacy results, which indicate that the close-distance subjects were more aroused. Perhaps the close-distance conditions made the male subjects more

sensitive to the word "arousal."

Subjects' sensitivity to the word "arousal" could have been made srtonger than usual because of the confederate's relatively passive behavior. This was reflected in their low Aggressiveness ratings of him. Male subjects were in a close seating arrangement with a passive male. Perhaps this raised concerns about homosexuality and about what the experimenter would think of their "arousal" ratings. In other words, the self-report findings could be an indication of an underlying latent homophobia in North American males. This could also be why nonverbal compensation is the common reaction of males to an increase in nonverbal immediacy.

A Crucial Test?

The usual assumption in the philosophy of science is that single crucial tests between theories are not possible. Hempel (1966) argued that a number of different crucial tests are necessary before a decision can be made with certainty. Lakatos (1974) added that a crucial test does not lead to complete and immediate acceptance of one theory and the rejection of another. The impact of a crucial test can only be assessed from the vantage point of history. McGuire (1983) asserts that theories are not tested but demonstrated, and that most reasonable theories are valid under some conditions. The purpose of research, according to McGuire, is to discover the different conditions under

which contrasting theories apply. The present study does not purport to be a crucial test, such that the arousal-labeling and discrepancy-arousal models of nonverbal immediacy reactions are rejected on the basis of the present findings alone. The present findings are merely one indication that these models do not apply to nonverbal immediacy behavior.

As mentioned above, a number of other findings from research on emotion questions to applicability of these models as well. Individuals are not sensitive to their own arousal; accurate perception of arousal is not necessary for the experience of emotion; physiological arousal itself may be unnecessary for the experience of emotion; physiological excitation is slow, whereas behavioral responses are almost instantaneous; and physiological arousal is not always ambiguous or neutral. When the findings of the present study are considered alongside these past research findings, the arousal-based models of nonverbal immediacy reactions seem very unlikely.

Further Research

The present findings indicate that social cognition determines whether nonverbal reciprocation or nonverbal compensation will be the response to an increase in immediacy. One direction for further research would be to investigate the relationship between nonverbal behavior and

social cognition more closely (Schneider, Hastorf, & Ellsworth, 1979, p. 149, note that the study of person perception and the study of nonverbal behavior developed separately, with little crossover). For example, this study used a causal attribution situation because this form of social cognition is supposedly common to everyone's implicit-theory assessments of the social environment. But the Intentional-Close and Forced-Close situations were quite salient: it was obvious that the confederate was or was not responsible for the close distance. Everyday situations are probably more ambiguous. Further research could use more ambiguous situations to investigate the behaviors and conditions under which individuals infer that another individual deliberately increased the level of immediacy.

Causal attribution is just the first step in the impression formation process (Shaver, 1983). Once the individual has assumed that the other person deliberately increased the level of immediacy, then other social cognitive processes will determine the kind of trait which is inferred or the kind of evaluation which is made of the other person. For example, at this point individual differences probably come into play: individuals with fundamentally different "implicit theories" will make different evaluations of the other person. Perhaps in other contexts a socio-cultural norm or "script" determines the kind of inference which is made about the other person.

The present findings indicate that nonverbal compensation may be the result of either negative evaluations of others or other, as yet undetermined factors (such as social norms, etc.). The social cognition model predicted nonverbal compensation in the Forced-Close condition because these situations are unusual and individuals may not have adequate schemata for dealing with them, etc. In other words, although nonverbal reciprocation will probably always be the result of positive evaluations of others, nonverbal compensation may be the result of other social cognition factors as well.

The relations between physiological arousal, social cognition, and nonverbal responses needs to be examined more closely. Although the present findings indicate that social cognition is the important determinant of nonverbal responses, the influence of arousal on cognitive processing and nonverbal behavior remains unclear. The arousal created by another person's nonverbal behavior is not ambiguous and therefore does not stimulate an epistemic search process. But what role does arousal play? Does it intensify normal behavior? There is some evidence that negative affective states do seem to have an effect on cognitive processes (e.g., Griffit, 1970). But at what point does this effect take place? In the present study, the discomfort or arousal in the Forced-Close condition was not strong enough, or of sufficient duration, to affect judgments of the confederate.

But presumably there is some point at which arousal will begin to influence cognitive processing and behavior.

Conclusion

The conclusion of this study is one that has been made before. Heider (1958) stated long ago that the inferences that we make about other people are very important influences on how our interpersonal relationships with them proceed.

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