

Hand Movements

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Abstract

A revision of our theoretically based classification of nonverbal behavior is presented, as it relates to the interpretation and measurement of hand movements. On the basis of the origins, usage and coding of the behavior distinctions are drawn and hypotheses offered about three classes of behavior: emblems, illustrators and adaptors. Findings from our own cross-cultural studies, our studies of psychiatric patients, and our studies of deceptive interactions, together with research by Kumin and Lazar, and a study by Harrison and Cohen are summarized to demonstrate the utility of this classification of hand movements. The differences between our formulation and those proposed by Freedman and Hoffman, Mahl, and Rosenfeld are discussed.

Introduction

Our effort over the past fifteen years has been to develop methods and a theoretical framework for studying nonverbal behavior. Our aim has been both to increase understanding of the individual, his feelings, mood, personality, and attitudes, and to increase understanding of any given interpersonal interaction, the nature of the relationship, the status or quality of communication, what impressions are formed, and what is revealed about interpersonal style or skill. While the study of interpersonal inter-

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actions can reveal information about each of the individual interactants, as when, for example, their interactive behavior is seen as a prime manifestation or index of their personalities, we draw a distinction between individual and interpersonal concerns, and study people both when they are alone and when they are "with" [Goffman: 16] another person. People have experiences as individuals when alone, changes in feelings and mood. Nonverbal behavior may then be the only source of information about their experience, since people rarely speak when alone; and nonverbal behavior may be an especially rich source in such circumstances, because when the individual is alone his nonverbal behavior is less subject to inhibition or control for social reasons. If we are to understand the influence of social rules about nonverbal behavior in interpersonal interactions, particularly about the management of what we have defined as affect displays and self-adaptors, we must also examine the individual when he is alone.

Our interest in what nonverbal behavior can tell us about individual experience as well as social interaction led to certain decisions about the size of the units we study. If we had been concerned only with the role of nonverbal behavior in social interaction, we might have focused only on what can be easily perceived by persons engaged in such an interaction. Micro-events not easily seen without slowed or repeated viewing would have been omitted. Our interest in the experience of the individual when alone has led to including such micro-events, while our interest in how nonverbal behavior functions in social interaction has required our examining molar units of behavior.

Throughout our studies we have emphasized a comprehensive approach, considering not just one aspect of motor behavior, such as facial expression, or eye contact, or hand movements, or posture, or leg movements, but all of these, if possible, on the same subject in the same settings. This comprehensive approach is based on our assumption that because activities in different areas of the body can serve equivalent or substitutive functions, studies of just one type of activity may provide an incomplete picture of what is occurring. Further, we believe that studies of the sequence of nonverbal behavior requires study of activities across the face and body. And, to the extent that we are interested in

one person's impression of another, we must consider the entire range of nonverbal behavior (and voice and words as well), since that is what is available to each participant in most interactions. Finally, some of our theoretical work has proposed major differences between the face and body, particularly when there is conflict about communication [6, 8].

This may seem to be a strange way to introduce a paper which discusses just one area of the body, hand movements, but we want to emphasize that we are reporting here just part of our work. We are conducting studies with the same materials on facial expression, posture, eye contact, and leg movement. The comprehensive approach, we believe, will provide the most important findings and a theoretical breakthrough in the study of nonverbal communication. In the last three years, most of our publications have reported our studies of facial expression [2, 7, 11, 12, 13]. During that time we have continued to analyze body movement as well. Here we will report an up-date of our theoretically based classification of hand movements, and some of our first results on the measurement of hand movements.

A Theoretically Based Classification of Hand Movements

We were anti-theoretical when we began our work measuring body movements, blaming the sorry state of this field of research on an over-abundance of theory with too few facts. Rather than considering anything about the origins of the behavior, its coding, or its usage, we were determined simply to measure the behavior itself, free of any theoretical guidance. The unit of behavior we proposed [3] was the nonverbal *act*, which was defined as a movement within any body area(s) which has visual integrity and is visually distinctive from another act. Acts which looked similar to our coders were given the same designation and their frequency and duration were measured. In studies of psychiatric in-patients, we found that some acts so defined were systematically related to concomitant verbal behavior and some acts conveyed specific information to observers when judged out of context. While we found that the frequency of particular acts differed between time of admission and time of discharge to a mental hospital for individual patients, we failed to find similarity across these patients

in the particular acts which occurred with the greatest frequency at either admission or discharge from the hospital [4]. Thus, analyzing behavior as separate acts provided information on an idiosyncratic but not a shared basis; the acts shown varied with ego states for each individual, but the same acts were not shown by individuals who were presumably similar in ego state. At about this time we re-read David Efron's [1] pioneering work on nonverbal behavior, in which he studied the conversational behaviors of Jewish and Italian immigrants in New York.¹ Greatly influenced by the fact that Efron's classification of body movements yielded findings which held across persons, we developed a theoretical scheme to classify body movement and facial expression, not solely on the basis of visual appearance as we did with the act, but on the basis of the *origin, coding and usage* of the act.

Origin refers to how the nonverbal behavior initially became part of the person's repertoire. We distinguished three origins: innate or built-in to the nervous system; species-constant experiences, that is, experiences always entailed when the human equipment interacts with any environment and survival results; and experiences which vary with culture, class, family, or individual.

Coding refers to the principle of correspondence between the act and its meaning, the rule which characterizes the relationship between the act and its significant. We distinguished three types of coding. An arbitrarily coded act has no visual resemblance to its significant; the movement in no way looks like or contains a clue to what it means. An iconically coded act carries the clue to its decoding in its appearance; the sign looks in some way like what it means.² An intrinsically coded act is like an iconic one, visually related to what it signifies, but here the act does not resemble its significant; it *is* its significant. For example, if one per-

¹Efron's book, long out of print, has just been republished with additional materials not available in the original publication.

²We further distinguished five types of iconic coding. For a complete explanation of what we mean by origin, coding and usage, and a complete description of our classification scheme, we refer the reader to Ekman and Friesen [5]. While we have updated some of our thinking in this article, we have also by necessity had to simplify or omit many aspects of our theory which are crucial to fully understanding it, or applying it in research.

son hits another during conversation, the hitting act is not iconic but intrinsic, the act is the significant.

Usage refers to the regular and consistent circumstances surrounding the occurrence of a nonverbal act. Usage includes the external conditions found whenever the act occurs, the relationship of the act to the associated verbal behavior, whether the person is aware of performing the act, whether the person consciously intended the performance of the act to communicate to another person, feedback from the other interactant, and the type of information conveyed by the act, whether it be shared or idiosyncratic, and whether it also is communicative or interactive. Idiosyncratic acts are meaningful, not random, activity, but the meaning is specific to one person. Among acts which have shared meaning there are those which were consciously intended to send a message to another person, communicative acts, and those which typically lead to a consistent change in the behavior of the other interactant, interactive acts. A given movement can be both communicative and interactive, or either—or neither. If an act has shared meaning but is neither communicative nor interactive, we call it informative.

On the basis of their origin, coding and usage, we then described five classes of nonverbal behavior. We will describe here just the three classes which are relevant to distinguishing among most hand movements: emblems; illustrators; and adaptors.

Emblems are those nonverbal acts (a) which have a direct verbal translation usually consisting of a word or two, or a phrase, (b) for which this precise meaning is known by most or all members of a group, class, subculture, or culture, (c) which are most often deliberately used with the conscious intent to send a particular message to the other person(s), (d) for which the person(s) who sees the emblem usually not only knows the emblem's message but also knows that it was deliberately sent to him, and (e) for which the sender usually takes responsibility for having made that communication. A further touchstone of an emblem is whether it can be replaced by a word or two, its message verbalized, without substantially modifying the conversation.

People are usually aware of their use of an emblem, just as aware as they are of the words they emit. However, there can be

emblematic slips, like slips of the tongue, when the sender apparently does not deliberately choose to make the emblem and may be unaware that he has done so. Emblems most often occur when verbal discourse is prevented by external circumstance (e.g., between pilot and landing crew), by distance (e.g., between hunters spaced apart from each other in the field), by agreement (e.g., while playing charades), or by organic impairment. Emblems of course also occur during conversation, repeating a verbalized message, replacing a word or two, adding a separate message not necessarily part of the verbal discourse, or contradicting the verbalization. Emblems, as we have defined them, are communicative and interactive acts.

The origin of emblems is culture specific learning. Efron [1] found major differences in the emblems used by Italian and Jewish immigrants to the United States. Saitz and Cervenka [25] have catalogued differences in emblematic behaviors between Colombia and the U.S. We have found major differences in the emblems used in urban Japan, urban Argentina, and a preliterate culture in New Guinea [10]. As we expected, there are a few emblems which are the same across these groups; these are ones which are similar because of our anatomy—referring to a body part, or to a bodily action which, because of anatomical constraints, can only be performed in one way. We have found the number of emblems in each group to vary, but in each group we discovered more than 50 different emblems, and in some more than 100.

Emblems can be either arbitrarily or iconically coded. In our studies of emblems we have uncovered both types. Emblems can involve actions in any part of the body, although typically they involve the hands, head orientation, facial muscular movement, or posture.

Illustrators are those acts which are intimately related on a moment-to-moment basis with speech, with phrasing, content, voice contour, loudness, etc. Illustrators usually augment what is being said verbally, but they may contradict the verbalization or be used as a substitute for a word. Illustrators are similar to emblems in that they are used with awareness and intentionality, although the use of illustrators is usually in peripheral, not focal,

awareness. Illustrators differ from emblems in a number of ways. Many of the illustrators do not have as precise a verbal definition as the emblems, and for some illustrators there is actually no obvious or agreed upon verbal translation of the act. Also, illustrators do not occur without conversation, or the rehearsal of conversation, while emblems may typically occur when the communicants cannot or choose not to converse. And, illustrators are only shown by the speaker in a conversation, not by the listener, while emblems may be shown by either speaker or listener.

Changes in the frequency of illustrator activity for any given individual depends upon mood and problems in verbal communication. When a person is demoralized, discouraged, tired, unenthusiastic, concerned about the other person's impression, or in a nondominant position in a formal interaction and setting, the rate of illustrators is less than is usual for that person. With excitement, enthusiasm about the topic or process of communication, when in the dominant role in a formal interaction, or in a more informal interaction where there is little concern about the impression being conveyed, a person uses more illustrators. When difficulty is experienced in finding the right words, or when feedback from the listener suggests he is not comprehending what is being said, illustrators increase. Illustrators can fill pauses, and maintain the role of speaker for the speaker if that is in doubt, and they can serve to command renewed attention from the listener if that is flagging.³ While illustrators aid in managing the behavior of the other conversant, and help the speaker explain and the listener understand what is said, illustrators also serve a self-priming function, helping the speaker past an awkwardness in his speech or thought, accelerating the flow of his ideas. We should note the qualification that these ideas about changes in

³ This function of illustrators would fit our definition of another class of movement, "regulators," acts which manage the flow of conversation [5]. We have purposefully allowed for overlap among our classes of behavior, when a particular instance is considered—some illustrators, but not all, and some emblems, but not all, in particular instances also should be designated as regulators because they are functioning primarily to regulate the conversational flow; but some acts which are not either emblems or illustrators, such as the affect displays, will also on occasion be employed as regulators; and, as will be explained shortly, an emblem can in particular instances be used as an illustrator.

the rate of illustrator activity are based on and meant to apply to middle class white Americans, and we do not know how much of this is general to other groups. Certainly we do know that the type of illustrator varies with ethnic background, and it may also vary with social class and age. We distinguish the following eight types of illustrators.

batons: movements which accent or emphasize a particular word or phrase

ideographs: movements which sketch the path or direction of thought

deictic movements: pointing to an object, place, or event

spatial movements: movements which depict a spatial relationship

rhythmic movements: movements which depict the rhythm or pacing of an event

kinetographs: movements which depict a bodily action, or some non-human physical action

pictographs: movements which draw a picture in the air of the shape of the referent

emblematic movements: emblems used to illustrate a verbal statement, either repeating or substituting for a word or phrase

Some of the terminology and some of the sub-types were first described by Efron [1], who found that the type of illustrator employed differed for Italian and Jewish immigrants to the U.S. We know of no further study of illustrator sub-types in the last thirty years.

By including emblematic illustrators as one sub-type, we wish to make clear that illustrators are not an exclusive category; the classification of a behavior as an illustrator depends upon its usage in a given context. An act can be both an emblem and because of its particular usage at a particular time also an illustrator. Our classification of illustrator sub-types should emphasize that there are many illustrators which do not involve emblematic acts. Further, illustrators may in a particular instance be also designated as regulators, if they manage the conversational flow (cf. footnote 3).

The eight illustrator sub-types are also not mutually exclusive.

Although many illustrators fall neatly into one or another category, others are combinations of sub-types. The need to distinguish the sub-types rather than simply measure the presence of any type of illustrator will depend upon the purposes of the experiment. If, for example, the investigator is interested in just how body movement is interrelated on a moment-to-moment basis with verbal behavior, or if he is interested in ethnic or social class differences in nonverbal behavior, distinguishing the illustrator sub-types should be profitable.

Illustrators are informative acts, and some could be considered communicative as well, although their explicit intentionality is not always certain. Illustrators can be interactive depending upon whether there is a response by the other interactant in a given context.

Illustrators are socially learned, presumably many of them early in life during language acquisition. Their chief function early in life is probably to command the adults' attention, and to aid in explaining matters for which the child has no words. The self-priming function could also occur early, but probably becomes more important after the child has a moderate vocabulary, when there is verbal material to prime. Most illustrators are iconically coded, the type of iconic coding varying with the sub-type. Some of the emblematic illustrators may be arbitrarily coded. Like emblems, illustrators may involve any part of the body, although typically they involve the hands, head, facial muscular movement, or postural shift.

Adaptors are movements first learned as part of an effort to satisfy self needs or body needs, or to perform certain bodily actions, or to manage and cope with emotions, or to develop or maintain prototypic interpersonal contacts, or to learn instrumental activities. Emitted in private, or even in public if the individual is alone, not with another person, and not the conspicuous object of anyone's attention, the adaptive act (i.e., nose-picking, head-scratching) will be manifest in its entirety, carried through to completion, so that it is obvious what need is being satisfied, what the person is about. When the person is aware that he is being watched, or is with another person, and particularly when he is speaking in a conversation, adaptor acts will be

reduced or fragmented, so that they are not nearly as conspicuous, nor is it always obvious what need is being met. These fragmented adaptors do not serve completely to accomplish their goal (the hand may go to the nose but the nostril may not be entered or cleansed, the scalp may be touched but the itch not thoroughly scratched).

The management of adaptors when the person is conversing, the process of reducing them in time, scope and completeness, seems to occur with little awareness, and the reduced adaptor is emitted with little cognizance by the performer. Adaptors are either iconically or intrinsically coded. If the movement is reduced or fragmented it approaches the iconic, but it could be considered intrinsically coded if the movement is not altered.

We distinguish *self-adaptors*, *object-adaptors*, and *alter-adaptors*. The last is discussed elsewhere [5].

Self-adaptors are learned and utilized in connection with a variety of problems or needs. Some are relevant to facilitating or blocking sensory input; some are relevant to ingestive, excretive, or autoerotic activity; some are relevant to grooming, cleansing, or modifying the attractiveness of the face and body; some are relevant to facilitating or blocking sound making and speech; and some appear to be aggression directed against the self.

All other things being equal, self-adaptors occur more frequently when the person is in a private rather than a public place, when alone rather than in the presence of others, when not in any way involved with others rather than "with" others, when listening rather than speaking in conversation. No matter when it occurs, the adaptor is never deliberately employed to communicate information to another person. Self-adaptors have no intrinsic relationship to concomitant speech, but they may be triggered by the motives or affects which are being verbalized, or by discomfort or anxiety about conversation.

When the individual is alone in a private place, he may or may not be aware of his adaptor activity. When he is in conversation, although he will reduce or fragment his adaptor acts, the individual is rarely aware of either managing or performing the adaptor acts. The performance of self-adaptors during conversation rarely receives direct attention or comment from others, ex-

cept for the parents' comments to the child. The person showing a self-adaptor will break visual contact with the other interactants, and they will not look at him in any sustained fashion until he finishes the adaptor activity.

Adaptors are unlike both emblems and illustrators in intentionality and awareness, having little of either. While emblems and illustrators will almost never be shown when the individual is totally alone, or disengaged from some form of communication with another person, self-adaptors will occur, often with high frequency and in their most complete form, when the person is alone.

In any given conversational setting people differ markedly in their rate of self-adaptor activity. Self-adaptors will increase with psychological discomfort or anxiety, although some people will show a decrease in self-adaptors when dis comforted or anxious, instead freezing movement in muscularly tense immobility. We believe that specific types of self-adaptors are associated with specific feelings and attitudes. Two examples can illustrate our thinking. Picking or squeezing part of the body is aggression against the self or aggression towards others temporarily displaced onto the self; covering the eye with a hand is relevant to preventing input, avoiding being seen, and shame. Both the action and location of the self-adaptor must be considered to decode the specific meaning of the act, although certain actions, such as the picking or squeezing, may have meaning in themselves regardless of location. While many parts of the body can perform an adaptor action (lips, teeth, legs, feet) we will discuss here only self-adaptors in which the hand is performing the action in contact with some part of the body. We classify the actions of the hand as rub, squeeze, pick-scratch, holds, supports, covers, grooms, massages and plays (plays are small movements where it is difficult to say just what the action is). Our list of locations which the hand may contact is based on both biological and psychological functions associated with different parts of the body. For example, we distinguish the eyes, ears, nose and mouth, but do not make locational distinctions within the cheek. While we make no distinctions within the forehead, we do distinguish the temple because it can symbolize thought. Additional loca-

tions are lips, chin, hair, neck, general torso, breasts, crotch, rump, arms, hands, fingers, legs, feet.

Object-adaptors involve the use of some object or prop, e.g., a pencil, part of the clothing, matchbook, etc. If the object is used to accomplish an instrumental task, we do not consider the act an object-adaptor. If the object is held or moved without serving an instrumental goal, the act is classified as an object-adaptor. For example, taking notes during a conversation is not an object-adaptor, but holding or playing with the pencil is. Doodling is intermediate, and we classify it as an object-adaptor. Similarly, smoking is not an object-adaptor, but playing with the cigarette, when lit or unlit, or playing with matches or lighter are object-adaptors. Object-adaptors are usually more within awareness than self-adaptors, and their meaning is more general—restlessness. Some object-adaptors can have more specific meaning, depending on the action involved [21]. For example, the prop can be used in an attack on the body, or to soothe or stroke part of the body.

Let us turn now to consider some of the research in which we and others have utilized this scheme for distinguishing different classes of hand movements.

Research on Emblems

Our initial work on emblems was a survey of emblems in different cultures. Our procedure was fairly simple. We started with an *a priori* list of messages which might be emblematic. The concept of emblems was explained to a subject, who was asked if he had a way of saying each message with his body. Subjects were asked to volunteer emblems not on the original list, and these were added to the list for the next subject. The emblematic performances were filmed or videotaped. An emblem was established for a cultural group if (a) the majority of subjects made the same movement for the same message, (b) a new group of subjects when shown the emblem correctly decoded the message, and (c) they agreed it was an intentional act used within their culture to communicate the message. As mentioned earlier, some emblems have appeared across the cultures we have studied. These are the ones which involve a message describing

a bodily activity which, for anatomical reasons, must be performed in similar ways. For example, if a culture has an emblem for sleeping, we have found it will involve moving the head into a lateral position, perpendicular to the body, with or without bringing one or both hands below the head as a kind of pillow.

Many messages are emblematic in more than one culture, but a different movement is used in each culture. With many of these the message involves the use of tools. For example, in the U.S. the emblem for suicide is placing the hand to the temple, with the hand in the "gun-shooting" emblem position (index finger extended, thumb raised and moved towards and away from the index finger, and the other fingers curled into the palm). In the Fore of New Guinea the emblem for suicide is grabbing the throat with an open hand and pushing up, a representation of hanging, which is how these people commit suicide. In Japan the suicide emblem is either to plunge one fist into the stomach, a representation of *hari-kari*, or to draw the index finger across the neck, a representation of slitting the throat.

Many messages are emblematic in one culture, and not in another. Efron, in the republication of his book [1], has included a list of Sicilian emblems. We are comparing these with our surveys in the U.S., Japan and the Fore of New Guinea.

Kumin and Lazar [20] have conducted a developmental study of emblems. Comparing 3 to 3½-year-old with 4 to 4½-year-old children, they found that the number of emblems performed and recognized increased with age. No work has yet appeared to our knowledge on the earliest appearance of emblems before and during language acquisition, although one of our students has written a theoretical paper on this topic [18].

We have studied a particular emblem as a clue to the occurrence of deception. Twenty-one student nurses were subjects in this experiment. They honestly described their reactions to a pleasant film in one interview and dishonestly attempted to deceive the interviewer in another session, pretending pleasant feelings when they had seen a stressful film.⁴ Pilot studies had suggested that a

⁴ For a complete description of the experimental situation see [9]; for a report of a study which showed that observers can more accurately judge the occurrence of deception from the body than from the face, see [8].



Figure 1
The hand shrug emblem.

particular emblem, the hand shrug which has the meaning of helplessness or inability (see Figure 1), would appear as a clue to the occurrence of deception.⁵ Our theory of nonverbal leakage and clues to deception [6] had specified that hand and leg movements would not be as closely monitored or disguised as the face during deception. Hand movements could provide either leakage of the concealed information, or a clue that deception was in progress without revealing what was concealed. In this instance, we expected that the hand-shrug emblem was occurring as a nonverbal slip of the tongue, with little awareness on the part of the subject, and that it was a deception clue.

All of the hand movements shown by the subjects in the honest and deceptive interviews were located, each was classified as an emblem, illustrator or adaptor, and the frequency of each was determined. As predicted, the hand shrug emblem increased in the deceptive session from a mean of 13.1 (expressed as a percent of total hand activity) in the honest interview to a mean of 23.5 in the deceptive interview, and this difference was significant at the .05 level.

Research on Illustrators

Harrison and Cohen [17] compared the frequency of illustrators used when subjects were given directions to a person visibly present and, over an intercom, to a person in another room. Illustrators occurred more often when the recipient was visibly present. They interpreted their findings as consistent with our explanation of the function of illustrators—they are intended to communicate information to another person and, at least in part, are used to help explain the verbalized message.

We know of no work pursuing Efron's discovery that the type of illustrator activity shown varies with ethnic origin. We have found some relationships between the frequency of illustrators, disregarding the type employed, and personality. Among the student nurses who participated in our deception experiment, frequency of illustrating in the honest session was positively cor-

⁵ Mahl [21] has described this emblem and attributed the same meaning to it, although his theoretical scheme does not distinguish emblems as a separate class of nonverbal behavior.

related with the femininity scale of the California Personality Inventory (.61) and with cooperativeness on the Interpersonal Check List (.53), but negatively with dominance (-.54 on the CPI, -.48 on the ICL). These findings must be viewed with great caution; although they are consistent, the sample was small and the relationships had not been predicted.

We did predict on the basis of our leakage theory that illustrators would decrease in the deceptive session. We expected fewer illustrators then because there would be less enthusiasm when witnessing the stress film. Although a perfect deceiver would still maintain illustrator activity when pretending a pleasant film was being viewed, our theory stated that hand activity is not used to simulate. The mean frequency for illustrators was 23.9 (expressed as a percent of total activity) in the honest session and 14.7 in the deceptive session, a difference significant at the .05 level.

Our studies of interviews conducted at the beginning and end of psychiatric hospitalization have also provided information about illustrators [19].⁶ The hand movements in the admission and discharge interviews with 31 female patients were classified. Nine of the patients had been diagnosed as psychotic depressive, seven as neurotic depressive and 15 as schizophrenic. We predicted an increase in illustrators from admission to discharge for the psychotic depressives because of the shift away from a dysphoric mood, but no difference in the schizophrenics. This prediction was confirmed, and there was a trend for illustrators to increase at discharge for the neurotic depressives; the psychotic depressives showed a mean of 2.7 illustrators at admission and 12.3 at discharge, a difference significant at less than the .05 level, and there was no change in illustrator activity for the schizophrenics. The patients were also rated on Overall and Gorham's [22] Brief Psychiatric Rating Scale, and these ratings were factor analyzed. We called the first factor "out of it," since the Overall and Gorham scales of withdrawal and motor retardation had the highest factor loadings. Scores on this factor were negatively correlated with illustrator activity (-.67). These findings were not

⁶ For a complete description of this study, see [9].

affected when a control was introduced for number of words emitted in each interview.

Research on Adaptors

Our deception experiment also provided data relevant to adaptors. We expected an increase in self-adaptors and object-adaptors in the deceptive interview, because subjects should be more uncomfortable and anxious than in the honest session. This prediction was not confirmed. When all self- and object-adaptors were considered, regardless of the type of action and the location of the action, there was no difference between the honest and deceptive sessions. Our sample was too small to compare many of the self-adaptor sub-types. One of the few sub-types which did occur with some frequency across subjects showed the predicted increase in activity. Face-play increased from the honest session (.33 mean percent of total hand activity) to the deceptive session (2.6); this difference was significant beyond the .01 level.

We also explored whether self-adaptor activity is related to how observers evaluate nonverbal behavior. A group of observers were told the nature of the situation, saw a sample of the subject's behavior during the honest session, which was identified as being honest behavior, and then saw an additional sample of behavior, which was from either the honest or deceptive session. They had to judge whether this unidentified sample came from the honest or deceptive session. The observers saw only the body; the face was blocked off from their view. From our interpretation of self-adaptors we expected that observers who viewed the body would tend to call people deceptive if they showed many self-adaptors (thus appearing anxious, fidgety, nervous) and honest if they did not. That is what did occur. The rate of self-adaptors was positively correlated (.75) with the observers' judgments of deception.

In another part of our analysis of the deception experiment we found that the subject's facial behavior during the honest and deceptive session was related to their work in the School of Nursing over the following year, both to their clinical grades (that is, ratings of how well they worked with patients), and to their academic grades. Untrained observers were shown just the facial behavior of each subject and asked to judge whether the subject

was being honest or deceptive. Subjects whose honest facial behavior was judged as honest did well in the School of Nursing over the next year, earning good academic and clinical grades. We may infer that those who were judged honest were those who appeared relaxed and that persons who can relax, or appear relaxed, in this situation are likely to be best able to do well in the nursing situation.

More important for our interests we found that skill in facial deceiving (that is, the observers were misled when they judged the subject's face during the deception session) was significantly correlated (.63) with clinical grades one year later when a partial correlation technique was employed to remove the influence of the relationship between grades and how the face during the honest session was judged. (The correlations between facial deceiving and academic grades were not significant when the partial correlation technique was applied.) We had expected to find such a relationship and had designed our deception situation in part to tap clinically relevant interpersonal skills and had explained the experiment and recruited subjects in those terms. These findings provided the basis for testing a hypothesis about self-adaptors.

Our interpretation of self-adaptors during deceptive interaction led to the prediction that the frequency of their occurrence would be negatively correlated with nursing grades in the following year. Our reasoning was that showing self-adaptors when deceiving was to be a poor deceiver. If deceptive skill is correlated with success in nursing, then those who show many self-adaptors when deceiving would not do well in the School of Nursing. An alternative prediction could be made, based on our interpretation that self-adaptors generally are a sign of discomfort or anxiety. This hypothesis would argue that subjects who were uncomfortable or nervous in the experiment would be those who would not do well in the School of Nursing quite independently of deceptive skill. The significance of self-adaptors in this context would be in their revelation of discomfort not of a lack of deceptive skill. From this viewpoint the correlation between self-adaptors and subsequent school performance should be found regardless of whether the self-adaptor occurred in the honest or deceptive part of the ex-

periment. The data support the first hypothesis, not the second. Self-adaptors in the deceptive session were negatively correlated with the combined clinical and academic grade (-.54) one year later, but self-adaptors in the honest session were unrelated to subsequent achievement in nursing school.

Our last source of evidence on self-adaptors came from the analysis of hand movements during the interviews with psychiatric patients. It will be remembered that the patients had been rated on the Overall and Gorham scales, and these ratings were then factor analyzed. The scales with the highest loading on the second factor were *anxiety* and *guilt feelings*, and scores on this factor were positively correlated (.38) with self-adaptor activity when the type of self-adaptor activity was disregarded. The scales with the highest loading on the fourth factor were *hostility* and *suspiciousness*; scores on this factor were positively correlated (.33) with self-adaptors in which the action was picking or scratching.⁷

CONCLUSION

We have presented our classification of hand movements, explaining the theoretical basis for the distinctions we make, and offering a number of hypotheses about the origins, usage and coding of three different classes of nonverbal behavior. The research reported does not test all of our hypotheses, but the evidence to date is consistent with our theory and most of the hypotheses tested have been supported. Most important, the studies briefly summarized here should serve to demonstrate the utility of our classificatory scheme in converting a seemingly vague area of behavior, hand movements, into data which can be examined quantitatively, yielding findings relevant to culture, personality and the nature of the interaction.

Our framework is posited on the notion that nonverbal behavior is not all of one kind. Even when dealing only with one area of the body, hands, it is crucial to make distinctions among some of the very different kinds of things people do. There is now some consensus among those studying hand behavior about

⁷ The third factor was one where the highest loadings were on the scales *unusual thought* and *concept disorganization*. Scores on this factor were not related to either self-adaptors or illustrators.

the need to make some distinctions. All have a category similar to our self-adaptors; Rosenfeld [24] called this category *self-manipulations*, Mahl [21] called it *autistic*, and Freedman and Hoffman [15] called it *body-focused*. All agree that this behavior related to negative feelings. There is disagreement about the specific negative feelings involved, their functions and meanings, and the usefulness of drawing further distinctions within this sphere of activity. All have a category similar to what we have called illustrators; Rosenfeld called this category *gesticulation*, Mahl called it *communicative*, and Freedman and Hoffman called it *object-focused*. All agree that this behavior is related to speech, and serves to explain what is being said verbally. There is considerable disagreement about what the sub-classes of this type of activity are, and how they function in conversation. Efron, ourselves, and Kumin and Lazar have worked with emblems, although the other investigators of hand movements describe behavior which we would categorize as emblems. As yet there is no data base for determining the relative utility of these different approaches, for deciding whether they are alternatives and which is more useful, or whether they are approaching different levels or aspects of the phenomena.⁸

In closing we reiterate that our distinction between illustrators, emblems and adaptors applies not only to the hands, but also to facial behavior and leg movements. In addition, we have proposed two other classes of behavior not described here, *affect displays* and *regulators* [5]. We believe that progress in the study of nonverbal behavior requires consideration of all five classes of behavior, all parts of the organism's motor activity—in the face, hands, legs, posture—and the interrelationship of these nonverbal behaviors with measures of voice and language.

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⁸ For recent work on hand movements, see Freedman, et al. [14] and Rosenfeld [23].

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