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NONVERBAL BEHAVIOR AND PSYCHOPATHOLOGY

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INTRODUCTION

We believe that the investigation of facial expression and body movement has valuable applications in the study of depression and other forms of psychopathology. The study of nonverbal behavior encompasses the examination of both global categories of activity such as facial mobility, hand movements, and posture, and of a whole array of very specific types of actions such as mutual eye glances, brow raising, hand rubbing, and foot tapping. Both the subject's *encoding* of behavior and his *decoding* of behavior may be measured. That is to say, in an *encoding* study we examine the subject's own nonverbal behavior, measuring some aspect of what the person actually does. In a *decoding* study, we measure the subject's interpretation of the nonverbal behavior of others. Individual differences in either the encoding or decoding of nonverbal behavior may permit interpretation of transient emotion, enduring mood, attitude, or personality. Films or videotapes of the behavior are generally used in both kinds of study.

For investigators doing research on psychopathology, measurement of the nonverbal behavior of patients can provide, we believe, systematic information of use in two aspects of their research.

Nonverbal behavior can be a data source for ascertaining the comparability of patients assigned to different treatment groups within an institution, or the comparability of patients in different institutional settings. One can utilize the

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nonverbal measures of encoding (the patients' actual nonverbal repertoire) or of decoding (the patients' ability to interpret the behavior of others). Both can provide a way to assess patients without having to rely solely upon diagnostic labels or global clinical judgments. The usefulness of measures of nonverbal behavior for this purpose will depend, of course, on evidence of how rich and complex the information is that can be gleaned from the patients' encoding and decoding of behavior, on the relevance of this information to the usual kinds of distinctions made by those studying psychopathology, and the extent to which such information provided by nonverbal measures differs from that which is readily available from other measures.

Nonverbal encoding and decoding measures can also be used in a pre-post design to assess change which occurs with some intervening treatment. The utility of such measures will depend on the extent to which they capture the kind of changes that occur when patients move from an acute to a remitted state.

A third use of the study of nonverbal behavior is more relevant to treatment than to research in psychopathology. Information about the meaning of certain kinds of encoding by a patient, and knowledge of any unusual characteristics in the patient's decoding ability could be useful in the training of psychotherapists. Our concern in this paper, however, is not with that application of our findings.

In recent years, there has been a rapid growth of research into one or another aspect of nonverbal behavior. Most investigators have studied body movements, though some have studied facial expression. Most have conducted encoding studies, though there have been some decoding studies. There have been two methodological approaches to encoding studies. One involves direct measurement of the *components* of the behavior. The other entails the study of observers' *judgment* or interpretation of the facial expression and/or body movement of the patient.

Using the components approach one might, for example, obtain a videotape of the patient's facial expressions during five minutes of an interview and measure the frequency with which the patient looked in the direction of the interviewer, the duration of glances, the frequency of eyebrow raises, of smiles, of lip presses, etc. A judgment approach to the same videotape would be to show it to a group of observers, trained or untrained, with or without coincident speech, and ask them to use their own words or a standard rating instrument to record their impressions about the patient's mood, personality traits, attitudes, etc.

Before discussing our own work, let me briefly note the major lines of research and some of the recent reviews of this literature.

Perhaps the most popular area in recent years has been research on *eye contact*, or *mutual glancing*. In our terminology, these are encoding studies using a components approach, in which the frequency and duration of the mutual glancing is measured. Most of these studies have examined only this variable, though some have also considered distance, but few have considered other

aspects of body movement or facial expression as well. Exline (1972) has recently reviewed his own work and that of others on mutual glancing.

A few investigators have looked at different types of hand movements, again conducting encoding studies measuring the hand activities of the subject with the components approach. Some of these investigators have examined other nonverbal variables as well, comparing hand movements with facial behavior, leg movements, etc. Recent work in this field includes that of Dittmann (Dittmann 1962; Dittmann & Llewellyn 1969), Freedman (Freedman & Hoffmann 1967; Freedman, Blass, Rifkin, & Quitkin 1973), and our own research group (Ekman & Friesen 1968, 1969a, 1969b, 1972).

There have been very few studies of the full range of facial expressions in an interpersonal situation. Most have been decoding studies, in which normative data are gathered within and across cultures. Recent work along these lines is that of Izard (1971), Ekman, Friesen, and Ellsworth (1972), Ekman (1972), and Ekman (1973). I will later discuss some of our own studies in progress on differences between face and body in the type of information conveyed and on differences among psychiatric patients in ability to decode particular facial expressions of emotion.

Another line of research on nonverbal behavior, using a *cross-channel comparative method*, falls generally within the definition of the encoding study with a judgment approach. Different groups of observers are exposed to different "channels"; i.e., they read a typescript, or hear filtered speech, or observe a silent film or videotape. Measures are then taken of the agreement or lack of agreement across channels in the information obtained by the observers from these different sources. (Later I will briefly present some of our own findings, which suggest that separating the patient's behavior into the three channels of voice, verbal content, and nonverbal behavior is too simplified a device, missing important distinctions within each channel and obscuring important similarities across channels.) Recent examples of this work are that of Bugental (Bugental, Kaswan, Love, & Fox 1970) and Mehrabian (1972).

Duncan (1969), in his recent review of research on nonverbal behavior, contrasted Birdwhistell's (1970) approach with our own (1967, 1968, 1969a, 1969b) to characterize two divergent lines of study of body movement and facial expression. Other reviews of the field are that of Harrison (1973), Knapp (1972), and Ekman, Friesen and Ellsworth (1972); the last is concerned only with facial expression.

In our own research, to which I will now turn, we have examined both facial expression and body movement, have conducted both encoding and decoding studies, and have employed both the components and the judgment approach. We have studied normal and disturbed persons, children and adults, alone and in interaction, in this culture and in other cultures. I shall present here our studies of interview behavior in this country, conducted with psychiatric patients and normal individuals, because it would appear to be the area of our work most relevant to investigators concerned with depression and other forms of

psychopathology. My purpose is twofold: to acquaint you with some promising findings, which I hope will encourage you to include measures of facial expression and body movement in your own research, and to give you some idea of the variety of methods and measurement techniques available to you.

Let me first describe our encoding studies using the judgment approach and then those using the components approach and lastly our decoding studies.

THE JUDGMENT APPROACH TO THE STUDY OF NONVERBAL BEHAVIOR

Global Assessments of Nonverbal Behavior

Some years ago, we conducted a series of encoding studies to demonstrate that facial expression and body movement spontaneously shown in the course of a psychiatric interview provide information about both changes in psychological functioning between admission to and discharge from a mental hospital, and about some of the more subtle distinctions among psychiatric patients suffering from the same general syndrome (e.g., depression) at either admission or discharge.

The methods employed in this research were fairly simple. An eight-minute film of each patient was made during a standardized interview conducted within 48 hours of admission to the hospital and again within a week of the time of discharge. A silent version was shown to a group of untrained observers (college students), who were not told that the person they were viewing was a mental patient. Each group of observers saw either the admission or the discharge film of one of three female patients and recorded their impressions of the person by checking adjectives on Gough's Adjective Check List. The results, reported in detail elsewhere (Ekman & Friesen 1968), need only be summarized here.

1. The nonverbal behavior shown at admission to the hospital conveys quite different information from that shown at discharge. For each patient, a number of adjectives checked by the majority of observers who saw the admission film were not checked by the majority of observers who saw the discharge film. And, conversely, a number of adjectives checked by the majority who saw the discharge film were not checked by the majority who saw the admission film. For example, one patient was judged to be despondent, worried, dissatisfied, fearful, self-pitying, sensitive, unstable, complaining, disorderly, gloomy, and moody by the majority of observers who saw her admission film, while she was described as friendly, talkative, active, impulsive, immature, cheerful, cooperative, energetic, feminine, and informal by the majority of the observers who saw her discharge film.

2. The information conveyed appears to have some relevance to the patient's psychological state. This finding, however, is more tentative, because the evidence is sketchy and not entirely consistent. When we compared the observers' judgments of one patient with her own self-ratings and with the

ratings of her made by the ward psychiatrist (both using Gough's list), we found the observers of the film to be more in agreement with the patient than with the psychiatrist at both admission and discharge. However, considering only those adjectives checked by both patient and doctor, we found that at admission all of these adjectives were also checked by the observers of the film, and at discharge all but one.

3. Nonverbal behavior conveys information that distinguishes among patients. Despite the fact that at admission they all shared the status of being acutely disturbed and the diagnosis of depression, and at discharge they were all in a state of remission, some adjectives checked by the majority of observers who saw one patient's admission film were not checked by the majority of those who saw another's, and similarly for the discharge films.

We consider this experiment to have provided a rough assay of the kinds of information that can be gleaned from spontaneous facial expression and movement. It showed that information relevant to psychopathology and changes in psychopathology can be readily obtained by untrained observers. While there is an obvious need to replicate these findings and to extend them to other patients, we believe they are encouraging and do offer a fairly simple means of assessing changes in psychological functioning associated with intervening treatment. Pilot studies conducted subsequently suggest that considerably shorter samples of interview behavior, from two to four minutes, will produce comparable results. Later I shall discuss some of our findings on how specific types of movement vary with changes in psychopathology.

The Face and Body as Sources of Nonverbal Leakage

After presenting in 1967 some of the findings just described to the Third Research and Psychotherapy Conference, sponsored by the American Psychological Association, we became convinced that investigators of psychotherapy outcome were not likely to adopt measures of nonverbal behavior unless we could show that such measures would provide crucial information not more easily obtained from a patient's verbal behavior. This pragmatic need focused our attention on a question fundamental to any theory of interpersonal communication. Are the verbal and nonverbal channels of communication redundant? And if not, what information is particularly conveyed by the nonverbal channel?

A number of situations come to mind in which a person's nonverbal behavior might be expected to provide distinctive information. A person's nonverbal behavior may speak for him when he is not willing to verbalize certain matters, or he cannot be directly asked, or the relevant information is not within his awareness, or there is reason to doubt his verbal statements. Of particular interest to us has been the situation in which there is conflict within the individual, either about the act of communicating or about the topic of

communication. In this situation, we have hypothesized, it is likely that the two channels will be discrepant (Ekman & Friesen 1969a). Following this line of thought, we began to develop a descriptive theory about the characteristics of deceptive interactions. We postulated differences among nonverbal behaviors, suggesting that some function to maintain the deception and others either betray the occurrence of deception or reveal the information being withheld. This formulation of *deception clues* and information *leakage* was the basis for research I shall shortly discuss. It suggested that the hypothesis that one channel (verbal or nonverbal) was more reliable than another was too simple. Instead, within each channel or behavior modality there may be some types or classes of events that function to maintain deception and others that escape efforts to control, censor, or disguise communication.

Our theory of nonverbal leakage and deception clues (Ekman & Friesen 1967, 1969a) postulated that the body more than the face escapes efforts to disguise communication, conveying clues to deception or leaking the withheld information. We reasoned that people are generally held more accountable for what they show in the face than what they reveal in the body, and, because of greater feedback and reinforcement, people will monitor their facial behavior more than their bodily activity, committing lies of omission by inhibiting facial muscular movement and lies of commission by simulating feelings they do not have. We further postulated a special class of facial behavior, very brief facial expressions (*micro-expressions*)[2], which would escape censoring and would provide leakage. We believed, however, that most observers would not notice such micro-expressions and would therefore be misled by the more frequent and obvious macro-expressions. Our theory also specified particular types of body movements that would provide leakage or deception clues.

We have tested the general hypothesis that different information is conveyed by the face and the body, both with clinical material of naturally occurring deception and with studies of normal subjects in experimentally arranged, deceptive, and honest interactions. Of 120 filmed interviews with psychiatric inpatients, there were three interviews of which we could be certain, from the patients' later confession, that they had been withholding information from the interviewer and lying about their feelings or thoughts. Separate groups of observers were shown either the face only or the body only during these deceptive interviews. The observers were not told they were viewing psychiatric patients and were required to use an adjective check list to describe their impressions of the person they viewed. For each of the three interviews, a comparison of the adjectives checked most frequently by those who observed the face suggested they were picking up the false message more than the concealed message, while the reverse was true for those who viewed the body.

[2] Haggard and Isaacs (1966) were the first to describe micro-expressions; our formulation expands upon but does not disagree with their interpretation of these very quick facial expressions.

We designed an interview procedure for obtaining deceptive and hone behavior, to replicate this finding with a larger sample of subjects, and to obta materials for testing our more specific hypotheses about particular boc movements during deception. We chose first-year student nurses as subject because we could ethically justify showing them some extremely unpleasa surgical films, and because we could motivate them to seriously attem deception by our pointing out that skill in deception was an interpersonal sk relevant to successful nursing.[3] In both the honest and deception interviews th subject first watched a silent motion picture film, while the interviewer s turned away from both the subject and the film. After a minute of suc unobserved film watching, the interviewer turned and faced the subject, askin her about her feelings as she continued to watch the film. After another minu the film ended and the interviewer continued to ask a standard set of questior about the subject's experience. In one session the subject saw a pleasant film an was instructed to describe her feelings frankly. In another session the subject sa a stress-inducing film and was instructed to conceal negative feelings with inter to convince the interviewer that she had pleasant feelings and was seeing pleasing film. Five of the twenty-one subjects confessed during the experimen and the videotape of their behavior was not used to test our hypothesis, sinc they had failed to maintain the deception.[4]

Separate groups of untrained observers saw either the face or the bod behavior of the nursing students during the deceptive and honest pleasar interviews. The observers were asked to judge if each person they viewed wa being honest (defined as attempting to describe frankly one's feelings about pleasant film) or deceptive (defined as attempting to conceal negative feelings i response to a stress film and to convince the interviewer that positive emotio about a pleasant film was felt). Our hypothesis that the body more than the fac provides leakage and deception clues was supported, in that those who saw th body reached a significant level of accuracy in detecting deception, whil those who viewed the face did no better than chance (Ekman & Friese 1974a).

This experiment has substantiated our hypothesis about a difference betwee the face and the body in deceptive interactions. Body behavior, more than faci behavior, escapes efforts to disguise communication or conceal information. W expect, in studies now planned, to show parallel differences between the verb and the vocal channel. Those who judge filtered speech and perceive, thereb just voice quality should be more accurate in detecting deception than thos

[3] We have in fact found that measures of nursing students' nonverbal behavior in ou honest and deceptive interaction experiment correlate about 0.60 with their clinical an academic grades one year later.

[4] We are pursuing the question as to why some subjects confessed. We are reasonabl convinced that it is unrelated to their understanding of the experiment, their motivation i the experiment, or their motivation to become a nurse and instead is related to a stabl interpersonal characteristic.

who read a typescript of the verbal content. And even within the verbal channel, those who are instructed to notice speech disruptions, incomplete words, etc., should be more accurate in detecting deception than those who focus attention on the content of speech.

The relevance of this particular experiment to those interested in studying depression is twofold. First, it shows that when an individual is in conflict, very different information may be obtained from different aspects of his nonverbal behavior. Second, it may be possible to utilize measures of the amount of agreement between judgments of the face and judgments of the body (and perhaps also between judgments of verbal content and voice), as an index of intrapsychic conflict. From inspection of our films of psychiatric patients we would hypothesize, for example, little discrepancy and high redundancy between the face and the body for the retarded or agitated depressive at the time of admission to a mental hospital and considerably more discrepancy towards the middle of hospitalization. We plan to test this hypothesis in the coming years.

THE COMPONENTS APPROACH TO THE STUDY OF NONVERBAL BEHAVIOR

Let me turn now from our encoding studies utilizing a judgment approach to those utilizing a components approach, in which the actual movements shown by the individual are classified and measured. First I shall explain our classificatory system for hand movements, and report results on hand movements during deception and hand movements in relation to psychopathology. Then I shall describe the classification and measurement of facial behavior and report some results with such measures.

Classification of Hand Activity

When we first began to measure body movement, our unit of analysis was the *nonverbal act* (Ekman & Friesen 1966; Ekman & Friesen 1968; Ekman, Friesen, & Taussig 1969). An act was defined as

> . . . a movement within any single body area (head, face, shoulders, hands, or feet) or across multiple body areas which has visual integrity and is visually distinct from another act. . . . Acts which look alike, established by paired comparison procedures, were given the same classification label. . . . The classification of acts . . . is thus based upon what is easily recognizable to any observer. The classificatory scheme is built directly from the acts . . . found in the film records, rather than derived from *a priori* notions. . . . This unit of behavior focuses on the type of nonverbal behavior which may be *potentially* communicative between two interactants. It is geared to the type of cue to which each member of the dyad may be responding (Ekman & Friesen 1968, pp. 193-194).

We found that acts so defined were systematically related to the concomitant verbal behavior, and conveyed specific and distinctive information to observers

when judged out of context. While the frequency of particular acts differed markedly between time of admission and time of discharge for particular psychiatric patients, we failed to find similarity across patients in the partcticular acts that characterized their admission and discharge interviews. This failure suggested to us the need to develop a theory for the classification of acts into functional categories. Our theory of the repertoire of nonverbal behavior (Ekman & Friesen 1967, 1969b) proposed five categories of nonverbal behavior defined as to the origin, usage, and coding of nonverbal acts. Each category included a variety of visually distinctive acts which, although differing in their appearance, were similar in their origins, usage, or coding.

Three of these categories are relevant to hand activity: *emblems, illustrators*, and *adaptors*.

Emblems differ from the other two categories of hand activity in their usage, particularly in relationship to verbal behavior, awareness, and intentionality. An emblem can usually be replaced with a word or two, or perhaps a phrase, and is known explicitly by all members of a culture, subculture, or social class. An emblem may repeat, substitute for, or contradict some part of the concomitant verbal behavior. A crucial question in determining whether an act is an emblem is whether it could be replaced with a word or two without changing the information conveyed. Emblems occur most frequently when verbal discourse is prevented by noise, by external circumstance (e.g., while watching a play), by distance (e.g., between hunters), by agreement (e.g., in the game of charades), or by organic impairment. In all of these instances emblematic behavior carries the messages that would otherwise be carried through words. Emblems, of course, also occur during the verbal exchange.

People are usually aware of their use of an emblem. If asked, they can repeat the emblem and usually will take responsibility for having stated the emblematic message. While the use of an emblem is usually intentional and deliberate, occasionally emblems are used with little awareness. There can be emblematic slips, much like slips of the tongue, but these are the exceptions rather than the rule. Emblems can be shown in any area of the body, although most typically they involve the face or the hands. Elsewhere (Ekman & Friesen 1967, 1969b; Ekman 1973), we have discussed the origins and coding of emblems, how they differ across cultures, and their relationship to emotional expression, but these matters are not directly germane to our discussion here.

Illustrators are movements directly tied to speech; they seem to illustrate what is being said verbally. We distinguish eight subclasses: *batons*, movements which accent or emphasize a particular word or phrase; *idiographs*, movements which sketch the path or direction of thought; *deictic movements*, pointing to an object; *spacial movements*, depicting a spatial relationship; *rhythmic movements*, depicting the rhythm or pacing of an event; *kinetographs*, depicting a bodily action; *pictographs*, drawing a picture of the referant; and the use of *emblems* to illustrate verbal statements, either repeating or substituting for a word or phrase. This class of behavior and some of the terminology was first

described by Efron (1941, 1972), who proved that the type of illustrator employed varied with ethnic background.

Illustrators are intimately related on a moment-to-moment basis to the phrasing, content, inflection, loudness, etc., of speech. Illustrators can repeat, substitute for, contradict, or augment the information provided verbally. Illustrators are similar to emblems in that they are used with awareness and intentionality. A person may be slightly less aware of his illustrators than of his emblems. Persons differ markedly in their rate and type of illustration. Changes in rate are associated with mood and articulation problems. When demoralized, tired, and unenthusiastic, people drop from their usual rate of illustrator activity. With excitement and enthusiasm about the topic or process of communication, people increase their rate of illustrator activity. When difficulty is experienced in finding adequate words, or when feedback from the listener suggests difficulty in comprehension, illustrator activity increases. In such instances the increase in illustrators may not only function to aid in communicating to the other person, but also may serve a self-priming purpose, helping the person past an awkwardness in his speech. Illustrators are also employed to command renewed attention if the listeners' interest appears to lag.

Adaptors are movements first learned as part of one's adaptive efforts to satisfy self or bodily needs, or to perform bodily actions, or to manage and cope with emotions, or to develop or maintain prototypic interpersonal contacts, or to learn instrumental activities. We have distinguished self-adaptors, alter-adaptors, and object-adaptors, although it is only the first category that concerns us here. Self-adaptors are learned in connection with the mastering or management of a variety of problems or needs. Some are relevant to facilitating or blocking sensory input; some are relevant to ingestive or excretive or autoerotic activity; some are relevant to grooming or enhancing the attractiveness of the face and body; and some were first learned to facilitate or block sound-making and speech. When first learned, these self-adaptors were associated with drive states, with particular emotions, with particular interpersonal events, with particular settings. Adults use adaptors *either* as an appropriate adaptive activity or because some aspect of the current situation triggers the adaptive reaction. In the latter instances only a fragment or a reduced version of the adaptor will usually be shown, probably because of later learned inhibitions about performing certain activities in public places.

Self-adaptors are usually performed with little awareness and no intention to communicate. Self-adaptors are not intrinsically related to speech; but they may be triggered by the motives or affects which are being verbalized. Self-adaptors receive little direct attention or comment from others, with the exception of a parent's comments to a child for performing self-adaptors in public. Although self-adaptors may be inhibited in the presence of others, people still do engage in such behavior during conversations; when they do so, they break visual contact with their fellow conversant, who also politely averts his gaze from this behavior.

Persons differ markedly in their rate of self-adaptor activity. Self-adaptors increase with psychological discomfort and anxiety, unless the person becomes immobile and muscularly tense. We believe that specific types of self-adaptors are associated with specific feelings and attitudes. Both the *action* and *location* of the self-adaptor must be considered, in distinguishing its specific meaning. Action refers to the activity of the hand when it contacts some part of the face or body. It may be scratch-pick; rub-massage, squeeze-pinch, hold-support, or cover. Our list of locations 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 area. While we make no distinctions within the forehead area, we do distinguish the temple because it can symbolize thought. Two examples of the psychological meaning of specific self-adaptors can illustrate our thinking. We have found that the eye cover act is associated with shame and guilt, and the scratch-pick act is associated with hostility.

Hand Movements and Deception

The first major test of the utility of our classification of hand movements into emblems, illustrators, and adaptors was in our research on nonverbal behavior during honest and deceptive interviews. In our theory of nonverbal leakage (Ekman & Friesen 1969a), we hypothesized that when individuals attempt to deceive they will fail to manage their hand activity (and leg activity properly and will instead concentrate on falsifying their facial behavior, speech content, and voice quality. More specifically we predicted that there would be more self-adaptors during a deceptive interaction than during an honest one, and fewer illustrators. The increase in self-adaptors and the decrease in illustrators were expected because subjects might well be less enthusiastic (illustrate less) and more anxious (self-adapt more) when trying to deceive the interviewer. Pilot studies suggested that a specific emblem, hand-shrugs, would occur with greater frequency in the deceptive than in the honest interviews. In other research we have verified that the hand-shrug emblem denotes helplessness and inability. In the deception session this emblem might occur if the person felt frustrated or unable to perpetrate the deception successfully. Though we believe that emblems usually occur intentionally and with awareness, the hand-shrug emblem during deception would be an exception, occurring with little awareness as the nonverbal equivalent of a verbal slip of the tongue.

We tested these hypotheses by analyzing from the videotape all of the observable hand movements in the honest and deceptive interviews of 16 nursing students. Two independent technicians located the beginning and end points of each observable hand act; they classified each movement as an illustrator, hand-shrug emblem, or adaptor. Self-adaptors were further subclassified by nine locations and five actions. As predicted, there were significantly more hand-shrug emblems in the deceptive interview than in the honest interview.

Again, as predicted, there were significantly fewer illustrators in the deceptive interview than in the honest interview. Our prediction that self-adaptors would increase during deception was not supported. When all the different types of adaptors (disregarding differences in location and action) were considered together, there was about the same frequency in the deceptive as in the honest interview.

We had not made predictions about specific subcategories of self-adaptors, but we did find that one such subcategory significantly increased in the deceptive interview. Face-play, an action in which one hand contacts some part of the face and engages in a very small, hard-to-distinguish movement, occurred with greater frequency in deception. We are not certain as to why this one subcategory changed in frequency nor can we easily explain why total self-adaptors failed to show the predicted increase in deception. One possibility, of course, is that our hypothesis that total self-adaptors are related to anxiety is incorrect or at least reflects too simple a view. There are two data sources that are relevant to that question and suggest that we may be correct in our interpretation of self-adaptors. Our prediction could have failed if anxiety was evoked for at least some subjects in both the honest and deceptive interviews. We had taken great pains to motivate the subjects, telling them that their behavior in both the honest and deceptive interviews was indicative of the likelihood of their success in nursing school. Self-report questionnaires administered at the time and some months later suggest the subjects believed us. In that context, conceivably some subjects would be anxious about their performance in both sessions and might show similar rates of self-adaptor activity in both sessions. The fact that the rate of self-adaptor activity in the two sessions was significantly correlated (.54) is consistent with this reasoning. The second bit of evidence consistent with our hypothesis that self-adaptors are related to anxiety comes from examination of how naive observers judge body movement. If you will remember, earlier we described an experiment in which groups of observers viewed videotapes showing only the body and judged whether they thought the person was being honest or deceptive. Even though the rate of self-adaptors did not differ in the two sessions (perhaps because both sessions were anxiety-provoking), if our interpretation of self-adaptors is correct we should expect that observers who view the entire repertoire of body movement might tend to call people deceptive if they showed many self-adaptors (thus appearing anxious, fidgety, nervous) and honest if they did not, regardless of the actual facts of the case. That indeed is what occurred. The rate of self-adaptors was significantly correlated (.75) with observer's judgment of deception.

Our results on illustrators and shrug emblems need to be replicated with another group of subjects and steps must be taken to verify further the meaning of self-adaptors.[5] We consider the findings to date encouraging, however. They suggest that our classification of hand activity into illustrators, adaptors, and

[5] We are also measuring leg movement, posture, gaze direction, and facial behavior.

emblems is useful, and that specific types of hand activity do relate to the occurrence of deception. We shall shortly see that some of the ambiguity about our interpretation of the self-adaptors is clarified by findings on psychiatric patients which are consistent with our interpretation of this class of activity.

I will postpone discussing the relevance of these findings to studies of psychopathology until after describing our findings on hand activity of psychiatric patients.

Hand Activity and Psychopathology

Kiritz (Kiritz 1971; Kiritz, Ekman, & Friesen in preparation) analyzed the hand activity in the admission and discharge films of 31 female psychiatric inpatients, whom we had filmed some years ago. Nine were diagnosed as psychotic depressive, 7 as neurotic depressive, and 15 as schizophrenic. All of the hand movements shown in the admission and discharge interviews of the patients were classified as illustrators or self-adaptors, and the self-adaptors were subclassified in terms of location and action.

On the basis of our theory that illustrators will vary with mood, increasing with enthusiasm and involvement, we predicted an increase in illustrators for the depressives from the admission to the discharge interview. This prediction was confirmed for the psychotic depressives and the trend was in the same direction, although not significant, for the neurotic depressives. We had not expected any change from admission to discharge in illustrator activity for the schizophrenics because there would not necessarily be the same shift in mood in these patients as in the depressives. As expected, there was no difference in illustrator activity in admission and discharge interviews of the schizophrenics. Illustrator activity in psychiatric patients, then, is not simply a function of the shift in the severity of psychopathology, but is related to shift in mood or affect.

Again, on the basis of our postulate that illustrators are related to enthusiasm and to involvement with the communication process, we made predictions about differences among these three patient groups in their illustrator behavior during the admission interview, when they were in their most acutely disturbed state. As hypothesized, the psychotic depressives showed fewer illustrators than either the neurotic depressives or the schizophrenics at admission. There was a trend for the neurotic depressives to use fewer illustrators than the schizophrenics at admission, but the difference did not reach significance.

To determine whether the hand measures were related to finer distinctions among patients than are captured by diagnostic labels, we obtained ratings of the patients on the Overall and Gorham (1962) Brief Psychiatric Rating Scale. The raters, experienced clinicians, first viewed and heard (sound film) the patient's response to the opening question in the admission interview ("How are you feeling today?"). After completing their ratings of the patient based on this sample of behavior at admission, the rater was then shown the same time-slice from the discharge interview and ratings were again made on the Overall and Gorham scales. In addition, the rater used a unipolar scale to judge improvement

from admission to discharge. There was reasonably good agreement among three independent raters who used the Overall and Gorham scales, and a measure of their combined ratings was used.

As predicted, a number of the rating scales were significantly correlated with our measures of illustrators or adaptors. The scale *depressive mood* was correlated negatively with amount of illustrating at both admission (−.51) and discharge (−.39). The scale *motor retardation* was negatively correlated with amount of illustrating at admission (−.66) and at discharge (−.36). The scale *emotional withdrawal* was negatively correlated with illustrating at admission (−.56) and at discharge (−.37). The scale *blunted affect* was negatively correlated with illustrating at admission (−.55) and at discharge (−.40). Although not predicted, illustrator activity was also significantly correlated with *conceptual disorganization* (.46) and negatively with *mannerisms* (−.43) and *cooperativeness* (−.46).

It seemed possible that these findings might be spurious, reflecting merely a relationship between rate of illustrating and rate of speaking. An increase in the patients' speech rate as they moved from a disturbed to a remitted state could account for most of the correlations reported. To check on this, we separately measured word rate and, although we found it was correlated with illustrator rate, when we controlled for word rate by using partial correlational techniques, most of the correlations with the clinical rating scales survived. Most of the relationships remained statistically significant, if somewhat lowered, when the influence of rate of speaking was removed.

Another way of using the clinicians' ratings on the Brief Psychiatric Rating Scale was to factor-analyze these ratings at admission and at discharge and examine the correlation of factor scores with hand measures. I will report only the results with the admission factors, as the results were substantially the same with the discharge factors. The scales with the highest loadings on the first factor were *withdrawal* and *motor retardation*. We call this factor "out of it" and it was negatively correlated with illustrators (−.67). The scales with the highest loadings on the second factor were *anxiety* and *guilt feelings*. We labelled this factor "upset," and it was positively correlated with total self-adaptor activity (.38). The scales with the highest loadings on the third factor were *unusual thought* and *concept disorganization*. We called this factor "schizi-ness," and it was unrelated to illustrator output. The scales with the highest loading on the fourth factor were *hostility* and *suspiciousness*. We called this factor "negativism," and it was positively correlated with picking or scratching adaptors (.33).

These results, like the results I have described to you on hand movements and deception, indicate the usefulness of our classification of hand behavior. We have shown that the distinction between illustrators and adaptors does indeed relate to

1. differences in the interview behavior of depressed patients at admission and at discharge;

2. differences between psychotic and neurotic depressives; and
3. clinical descriptions of the characteristics of patients.

Presumably when clinicians evaluate patients making judgments on such characteristics as withdrawal or anxiety, as in the Overall and Gorham rating scales, they utilize a variety of data sources: past history, the words, word usage, word content, voice quality, paralinguistic cues, facial expressions, posture, leg movements, and hand activity. Our study was not designed to determine the extent to which clinicians utilize hand activity as they customarily make their judgments, but to test whether our systematic measure of hand activity would relate to such judgments. That I believe we have achieved. We would expect that as we measure other aspects of nonverbal behavior—leg movements, posture, eye contact, facial muscular movements—we will also obtain correlations with clinical judgments. When we take into account a number of these nonverbal variables, we will perhaps be able to make assignments that will replicate those made on the basis of clinical judgment.

The usefulness of this research for those studying depression or psychopathology is not, however, as a substitute for clinical judgment. Even if measuring hand activity or other kinds of nonverbal behavior could produce the same judgments as a clinician, it would be a rather impractical way of going about matters, since measurements of nonverbal behavior are more laboriously achieved than the usual clinical ratings. Instead, its usefulness is as a different, clinically relevant method of assessing an individual's interpersonal behavior. We need not rely only on the clinicians' inferences about such states as anxiety, but can also directly measure the patient's behavioral repertoire through procedures such as our classification of hand activity. As I pointed out at the beginning of the paper, nonverbal measures can be used either as a way of insuring comparability in the assignment of patients to different groups or insuring the comparability of patients studied across different institutions, or, if taken at different points in time, as a pre- post-measure of treatment outcome.

FACIAL BEHAVIOR: COMPONENTS AND JUDGMENT APPROACH

For the last seven years a major part of our research on facial expression has been concerned with similarities and differences across cultures (Ekman 1968; Ekman, Sorenson, & Friesen 1969; Ekman & Friesen 1971). Before approaching the question of individual differences in facial expression of emotion, we felt it was necessary to attack the question of universality, which was the central issue in most of the past confusions and contradictions in theory and data about facial expression. The argument has been whether facial expressions of emotion are unique to each culture, learned much like a language (as claimed by Birdwhistell 1963, 1970; Klineberg 1938, 1940; LaBarre 1947), or instead are universal for all men, biologically based in man's evolution (as Darwin 1872, 1965, and recently Tomkins 1962, 1963, have held). Let me acquaint you with our current

thinking on this issue by quoting from our most recent integration of the results of our cross-cultural studies (Ekman 1972):

> The evidence is remarkably consistent from four experiments, and, in our evaluation, conclusively proves that there are universal facial expressions of emotion. We have reported data on five literate cultures, four Western and one Eastern, and on two pre-literate cultures from New Guinea. The samples were drawn from six different language groups. . . . The first experiment studied judgments of spontaneous facial expressions in Japan and the United States showing that these facial expressions were judged the same way by members of both cultures. In the second experiment we then showed through measurement that the same facial behaviors . . . characterized the Japanese and American reactions to a stress film. Further evidence of the universality of facial expressions of emotion was obtained in the third experiment which showed that the same facial expression was interpreted as showing the same emotion in five literate cultures.
>
> The possibility that these findings might not reflect the operation of a [common, biologically based] facial affect program, but that facial expressions are pan-cultural only among people who have had sufficient visual contact to learn each other's facial expressions or learn common expressions from mass media models was eliminated in the studies of two visually isolated pre-literate cultures. The same facial expressions were found for the same emotions among these people who had no opportunity to learn Western or Eastern facial expressions from a mass media and who had seen so few Caucasians that it was unlikely that they could have learned a foreign facial language. We believe then that we have isolated and demonstrated the basic set of universal facial expressions of emotion. They are not a language which varies from one place to another; one need not be taught a totally new set of muscular movements and a totally new set of rules for interpreting facial behavior if one travels from one culture to another. . . .
>
> In explaining these results . . . [we have developed a neuro-cultural theory of facial expression which postulates] both universal and culture-specific expressions. . . . Our neuro-cultural theory postulates a facial affect program located within the nervous system of all human beings linking particular facial muscular movements with particular emotions. It offers alternative nonexclusive explanations of the possible origin of the linkages in the affect program between the felt emotion and the movement of the facial muscles. Our theory holds that the elicitors, the particular events which activate the affect program, are in largest part socially learned and culturally variable, and that many of the consequences of an aroused emotion also are culturally variable, but that the facial muscular movement which will occur for a particular emotion (if not interfered with by display rules) is dictated by this affect program and is universal. (pp. 276–279)

We introduced the concept of display rules to describe a learned mechanism which can override the affect program and control facial appearance.

Our theory is *neuro-cultural* because it deals with two quite different sets of determinants of facial expressions, the first responsible for universals and the second for cultural differences. "Neuro" refers to the facial affect program, which determines the relationships between particular emotions and the firing of particular patterns of facial muscles. "Cultural" refers to the second set of determinants, which are most of the events that elicit emotions, the rules about controlling the appearance of emotions (display rules), and the consequences of emotions; these, we hold, are learned and vary with cultures. There is, however,

a third set of determinants. These are the psychosocial determinants of facial expressions of emotion, which are responsible for differences within a culture among social classes, age grouping, sex roles, families, and personality.

In the last few years we have been developing theory and conducting experiments on how personality may be manifest in facial behavior. It would be premature to attempt here more than a brief description of our approach to this phenomenon. We believe that some of the individual differences of facial behavior result from idiosyncracies in the learning of display rules. Display rules are social norms regarding facial appearance, probably learned early in life and functioning on a habitual basis. They specify which one of four management techniques is to be applied by whom to which emotion in a given circumstance. The four management techniques are to (1) intensify, (2) deintensify, or (3) neutralize the appearance of a felt emotion, or (4) to mask it with the facial configuration of another emotion. For example, at a United States white middle-class wedding display rules specify that the groom must mask any appearance of distress or fear with a happy countenance, while the bride is not similarly constrained. Another example of a display rule is that, in a patient-physician encounter the patient, no matter what the illness, must in the initial greeting reciprocate the physician's (also required) smile, before facially displaying negative affect relevant to the illness. We believe that psychotic-depressives fail to follow this display rule and, unlike neurotic-depressives, will not as often show the initial greeting smile. We also believe that the later appearance of the greeting smile is correlated with a sign of improvement in mental state. More generally, the psychotic-depressive patient fails to follow the usual display rules regarding the management of negative affect. It is not that psychotic-depressed patients are unique in the facial appearance they show with negative affects, but in their consistently maintained negative affect across situations and their seeming inability to modulate it. Put in other terms, in the depressed patient certain negative affects are *flooded*.

We believe that, as a result of particular display rules learned within the family, individuals may in their adult life show *blocks* in facial affect expression. In the extreme, the person may be poker-faced, never revealing in his face how he feels. A less extreme deviation is the block in expressing a particular emotion; for example, a person may never facially show anger. A lesser deviation is the block in the expression of a particular emotion toward a particular class of people. For example, the person may never show anger towards female authority figures. From a pilot study, it appears that blocks in expression may be manifest in two rather different ways. One is that the person simply doesn't show the facial expression of a felt emotion. In a more complex manifestation, the expression is not blocked, but the feedback is, such that the person is remarkably unaware of having shown the particular expression.

We believe it may also be possible to characterize people in terms of an extraordinary facility for showing emotional expressions in their face. For some, this may be characteristic of all the emotions, and they may get into trouble or

at least be known for showing everything in their face. The facility may be more specific to a particular emotion, however, so that the person often looks afraid or angry, etc. A neighboring concept, first described by Silvan Tomkins, is that of the *frozen* affect. The frozen affect is an enduring muscular set of the face; after a particular expression, the face, instead of returning to a neutral countenance, may return to a slight version of one or another affect. Thus, the person always looks just slightly disgusted or amused or melancholy, etc.

Another manifestation of personality may be in affect blends and affect sequences. In an affect blend, the face shows the distinctive characteristics of two emotions simultaneously. While it is possible for any given event to elicit two emotions simultaneously, resulting in a blend expression, individuals may show a blend when only one emotion has been elicited by an external event, if they have an established habit of associating a second feeling with the elicited one. For example, when disgust is aroused, some people may characteristically feel also afraid of being disgusted, others may feel angry, others may feel happy, etc. This affect-about-the-affect will repetitively be manifest in either a blend or a rapid sequence of the two emotions in the face.

It should be clear that what I have said so far about individual differences and facial expressions of emotion is based on either pilot studies or hunch and still enjoys more the status of conjecture than formalized hypothesis. Yet these kinds of phenomena are now amenable to systematic investigation. Research on personality differences and facial behavior has been stymied by the lack of any systematic, quantitative procedure for measuring the spontaneous facial expressions of emotion. In the course of our cross-cultural studies, we have developed a technique for such measurement (Ekman, Friesen, & Tomkins 1971), the Facial Affect Scoring Technique (FAST). This procedure provides the investigator with a tool for quantifying the moment-to-moment changes that may occur in facial behavior. Applied to films or videotapes, it provides frequency and duration data on the occurrence of six emotions (happiness, sadness, anger, fear, surprise, and disgust), blends of these emotions, and sequences. Our major work until now has been normative, as we have attempted to validate this measurement technique. While FAST is far from completely validated, we have achieved success in three validation experiments to date and will be expanding our efforts now to utilize it in studies of the face and personality. (Our most recent work on personality and facial expressions is reported in Ekman and Friesen, 1974b.)

DECODING STUDIES OF NONVERBAL BEHAVIOR

The approach to the study of individual differences discussed so far has entailed the investigation of patients' encoding of nonverbal behavior. It is also possible to study how individuals differ in their decoding of the nonverbal behavior of others. Personality and psychopathology may be manifest, for example, not just in a patient's blocks in the facial expression of certain

emotions, but in blocks in his sensitivity to or understanding of the facial expression of others.

We have begun a series of experiments on individual differences in the decoding of facial expression of emotion. We have developed a test which we call the Brief Affect Recognition Test (BART), which measures a person's accuracy in decoding six emotions—happiness, sadness, anger, fear, disgust, and surprise. The test employs still photographs of facial expressions which, when seen for five seconds, elicit very high agreement about the presence of one or another of these emotions. In the test we present these faces in a tachistoscope, with an exposure ranging from 1/100th to 1/25th of a second. Our rationale for such a brief presentation is that it approximates usual interpersonal conditions, in which a single facial expression can easily be missed. The usual facial expression lasts only a second or two, is embedded in preceding and subsequent facial behavior, and competes for attention with body movement, voice quality, and verbal content.

Our hypothesis is not that people will differ in their total performance, that is, in their accurate recognition of all six emotions, but that they will differ in their patterns of accuracy, recognizing three or four emotions and not the others. Two studies have been completed.

One experiment (Shannon 1970; Shannon & Ekman, in preparation) compared medical patients, schizophrenics, and depressives. No difference was found in total accuracy; as predicted, depressives were less accurate on fear while schizophrenics were less accurate on disgust. In the second experiment (Ekman, Jones, Friesen, & Malmstrom 1970), we found that subjects who had ingested marijuana performed differently from those who had ingested alcohol; moreover, there was a relationship between self-reported mood and accuracy in recognizing particular emotions. We are currently attempting to replicate these findings and standardize the Brief Affect Recognition Test.

CONCLUSION

In summary, then, the facial expressions and body movements both shown by psychiatric patients (encoding) and recognized by them (decoding) can provide information about emotion, attitude, and personality useful to those doing research on psychopathology. To date the promise is far greater than the achievement, but this field of research is now beginning to make rapid progress. Encoding can be studied with a judgment approach and with a components approach. The first approach involves global assessments of encoding; it employs trained or untrained observers, who make judgments based on some sample of nonverbal behavior. The second approach is to measure directly some aspect of the patient's activity. I have described our studies of hand movement and presented some of our conjectures about measurement of facial behavior. In studies of decoding, we investigate differences in how patients interpret the

nonverbal behavior of others. I have described our preliminary findings with our Brief Affect Recognition Test of patients' ability to interpret facial expressions of emotion.

At this time such studies of nonverbal behavior are, at best adjuncts to more conventional measurements of individual differences utilized by those who study psychopathology. Evidence about the utility and validity of these techniques for measuring nonverbal behavior is still far from conclusive. We are still at the stage of validating nonverbal measures in relationship to the usual diagnostic distinctions or clinical ratings. Some work has begun on the next stage of research on nonverbal behavior to show that measures of nonverbal behavior provide more reliable data, or more sensitive indices, or qualitatively different information from that which is customarily obtained with more conventional methods of assessing individual behavior. It is the results of such studies that will determine the potential of this growing field of research on facial expression and body movement for those interested in psychopathology.

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DISCUSSION

Dr. Friedman: Dr. Ekman, could you give us any more detail on the results of your studies on individual differences in the decoding of facial expression as measured by your Brief Affect Recognition Test?

Dr. Ekman: In one study (Dr. Anna Shannon's doctoral dissertation, 1970), a depressed, a schizophrenic, and a control group of general medical patients at the Palo Alto Veterans Administration Hospital were compared. There was no difference between the three groups in their recognition of sad facial expressions. The depressed and schizophrenic patients were less accurate than the general medical group in the recognition of anger facial expressions. The depressed group did considerably worse than either the schizophrenic or the general medical patients in the recognition of fear facial expressions. The schizophrenics were less accurate than the depressives or general medical patients in the recognition of disgust facial expressions.

In another study (Ekman, Jones, Friesen, & Malmstrom 1970), the Brief Affect Recognition Test was given in a pre-post design to medical students. One-third of the subjects smoked marijuana, another third drank alcohol, and the last third were a placebo group. There was no change in accuracy for the placebo group. The alcohol group became more accurate in recognizing disgust facial expressions and the marijuana group became less accurate in recognizing sadness and fear facial expressions.

We believe that these findings must be considered with great caution. The differences obtained in the drug study were not predicted and only some of the differences obtained in the schizophrenic-depressive study had been predicted. The schizophrenic-depressive study has not yet been replicated. We are in the midst of attempting to replicate the drug study but the data analysis is not complete.

Dr. Schuyler: Dr. Ekman, based on your findings, have you made any inferences about the various clinical entities?

Dr. Ekman: There exists very little theory, experimental data, or clinical observation to guide our research on individual differences in the recognition of specific facial expressions of emotion. The study on psychiatric patients did replicate one finding of Silvan Tomkins' some years ago. He used a different test procedure. Rather than a tachistoscopic presentation, he used a stereoscope to superimpose two photographs of different facial expressions, requiring the subjects to judge the emotion they perceived. He found that the depressives failed to recognize the fear facial expression, and this is consistent with our finding. However, he found depressives differed in their judgments of sadness, a finding we did not obtain. Let me repeat my caution that our results on individual differences in judgment of facial expression should be regarded with skepticism until some replication has been achieved.

Dr. Klerman: There is one aspect of theory which might be tested with this technique, namely, the interpersonal theory of depression advanced by the Mabel Blake-Cohen group (1954). In their classic paper they described the depressed group as consisting of people who are generally insensitive to interpersonal nuances and one component of that skill is thought to be the capacity to sense empathetically the communications of others. Dr. Ekman, I believe, has described a method to test this hypothesis, for we would predict that depressed patients would be impaired in their ability to recognize emotional states in others.

Dr. Ekman: The one finding that has replicated in our various studies of individual differences in the recognition of facial expression with the Brief Affect Recognition Test is that performance is patterned. It is a rare individual who fails to recognize all six emotions accurately when they are briefly presented in the tachistoscope. While some individuals are good in their judgment of facial expression, accurately recognizing all six emotions, almost no one is bad in the sense of failing to recognize the majority of the photographs for all six emotions. Most people, whether psychiatric patients, general medical patients, or intoxicated medical students, show a patterned response, accurate on three or four emotions and inaccurate on one or two. Our findings on the depressive patients are not as you suggest, Dr. Klerman. The patients are *not* impaired in their ability to recognize *all* emotional states but instead are impaired only in the recognition of anger and fear facial expressions.

Dr. Friedman: This work is in its infancy, as you say, and some of the findings might be more specific to Dr. Klerman's suggestion when subsamples of depressed patients are studied. For example, the Mabel Blake-Cohen group described manic-depressive patients and I believe, Dr. Ekman, the studies which you described were done with a variety of depressed patients but not necessarily a pure manic-depressive group. Perhaps more light will be shed on this aspect of interpersonal opaqueness when others begin to study more clearly defined diagnostic entities. I think it would also be exciting to engage in studies that

attempted to measure the changes that occur in depressed patients between admission and discharge, i.e., between the height of their depression and remission.

Dr. Ekman: These are excellent suggestions. There is no doubt in my mind that in further work with the Brief Affect Recognition Test we should, as Dr. Friedman suggests, attempt to differentiate types of depressive patients and also determine whether there are changes between admission and discharge from the hospital.

Dr. Goodwin: I believe that Dr. Ekman's studies of the nonverbal behavior of the patient, what he has termed encoding studies, in which the actual facial expression and body movements shown by the patient are examined, are very exciting and potentially useful for depression research. I believe there will be a number of practical applications of this technique to biological studies in depression. One of the most troublesome and confounding variables in all biological research has been the factor of agitation-retardation. Many studies are confounded by the absence or presence of agitation, and clinically people are extremely poor at labeling this variable. I wonder if it would be possible to train a nurse to count hand or other bodily movements without using a TV camera, or is the videotape necessary so that you can go back over the same segments several times?

Dr. Ekman: We have never attempted to train people to count movements without using the videotape, but we have trained some skilled nurses to do so off of the videotape. Since agitation is manifested across the entire body, it would be necessary to look at the hand, the feet, the shoulder, and the head movements all at one time, and this could not be done by a single observer except by using the videotape, with which several passes of the same time segment could be made by replay. Whether a nurse could be trained to obtain the same information without using the TV is an empirical question and could easily be determined.

Dr. Chodoff: Have you done any studies attempting to correlate the various dimensions such as illustrators and adaptors with personality variables such as obsessiveness or hysterical features or schizoid patterns, etc.?

Dr. Ekman: If you will recall, we did find correlations between illustrators and adaptors and clinical ratings on the Overall & Gorham Brief Psychiatric Rating Scale. For example, illustrators were negatively correlated with emotional withdrawal and adaptors were positively correlated with the factor that had to do with anxiety and guilt feelings. In our study of illustrators and adaptors shown by normal subjects in our honest-deception experiment we have also obtained some relationships between hand activity and personality. The frequency that the subject illustrates during the honest session is negatively correlated with the California Personality Inventory (CPI) dominance scale (−.54) and positively correlated with the CPI feminity scale (.61). Another beginning study on individual differences in the encoding of nonverbal behavior and personality also used measures of the subjects' behavior in the honest

session. Here we correlated how the subject's facial behavior during the honest session was judged with personality tests. Subjects whose facial behavior during the honest session was judged as honest (and not deceptive) tended to be dominant (.68) and sociable (.55), as measured by the CPI and Machiavellian (.49).

Although I believe these results will replicate, replication studies have not yet been performed, and thus these findings must be considered quite tentative.

Dr. Seligman: I believe that Dr. Ekman presents some very exciting data about the depression model I have put forth. Specifically, I am referring to the finding that between admission and discharge depressed patients show an increase in their illustrator-adaptor ratio. My inference is that they thus change from being an adaptor to being an illustrator. Since I am saying that depression ensues when the person has learned that there is nothing he can do to relieve the situation, I would predict that response initiation would be retarded, but specifically that purposive, voluntary response initiation would be retarded and the involuntary and non-purposive response initiation would not necessarily be impeded. Now as I understand Dr. Ekman's illustrator-adaptor findings, that is exactly what he is showing. Clearly an illustrator is something voluntary and purposive and is decreased in depression, whereas adaptors seem to be unconscious and involuntary and they do not seem to change over the course of the depression.

Dr. Ekman: This is an interesting interpretation of our findings and is consistent with our thinking.

Dr. Beck: Dr. Ekman's data do seem to corroborate Dr. Seligman's theory and also suggest to me an interesting methodology which could be employed in research to differentiate the agitated and the retarded depressions. There is a growing body of evidence that these two subgroups will respond differentially to drugs. Agitated depressions seem to respond better to phenothiazine regimens whereas retarded depressions do best with one of the antidepressant drugs.

Dr. Ekman: I believe Dr. Beck is correct in his suggestion that our measures of individual differences in the encoding of nonverbal behavior could be usefully employed in differentiating agitated from retarded depressives.

Dr. Klerman: Dr. Beck makes a valid point, but I suspect the true value of Dr. Ekman's methodology will rest on the biological studies, as Dr. Goodwin pointed out, rather than as a differential diagnostic tool. I believe the differentiation of agitation and retardation is a specific problem in the United States because American-trained psychiatrists, at least when compared to their British counterparts, have rather low diagnostic acumen around the use of terms such as agitation and retardation. This might well be because we emphasize verbal content in the United States at the expense of nonverbal behavior and, indeed, Dr. Ekman has some data which support this contention.

I believe one of the future uses of this technique which Dr. Ekman has presented to us will be in the area of training, where learning to discern facial

and hand movements and especially the various subtypes of nonverbal behavic which Dr. Ekman has discovered will prove to be valuable for the clinician Another immediate use I can foresee for this technique will be in the training c observers who participate in research experiments. One problem that has plague clinical research is the training of clinical observers to use rating scales with an degree of reliability. I have often hypothesized that we fail to obtain treatmer effects in certain studies because of this high "noise" in the system caused b inadequate observer training.

Dr. Ekman: I certainly agree with Dr. Klerman that one of the future uses c our research is in the area of clinical training. We believe that our approach wi go beyond simply bringing this domain of behavior to the attention of the clinic: practitioner. Our aim will be to provide more specific instruction about th meaning of particular body movements and facial expression (c.f. Ekman & Friese 1974) We have begun such training but have not yet attempted to systematicall evaluate its usefulness for the practitioner. I had not considered Dr. Klerman other suggestion, although I think it is a very good one. I believe he is correct i suggesting that some of our materials could be used to improve the training c observers who use rating scales to judge the behavior of psychiatric patients.

Dr. Klerman: I would hypothesize that illustrators serve a communicativ function and that adaptors serve to discharge a drive state.

Dr. Ekman: Yes, illustrators and adaptors could serve these functions. W find that people only illustrate when they speak, not when they lister Consistent with our interpretation and Dr. Klerman's interpretation of illustr tors, studies show that if visual contact between speaker and listener is blocke there is a decrease in the speaker's illustrators (Mahl 1968; Cohen & Harriso 1973). This is not to suggest that in such circumstances there will be a tot absence of illustrators. People will illustrate when talking on the phone or whe rehearsing a speech, although presumably less than when the listener is visuall present. Presumably the maintenance of some illustrator activity, even when th listener is not visually present, is due to habit and/or the self-priming o articulation which illustrators may accomplish.

The increase in adaptors that occurs when a listener is not visually presen probably results from the fact that we have been taught to inhibit groomin activity somewhat when we can be seen. Just as some illustrators will still occu when the speaker is alone, some adaptors will still occur when the speaker anc listener are in each other's visual presence. People are not nearly as polite as they think; ear-scratching and other self-adaptors still do occur during conversation although they are slotted in such a way that speaker and listener collusively dc not attend to their occurrence.

We believe that most people are aware of their illustrator activity. You can interrupt someone and ask him what movement he was making while he was speaking and if it was an illustrator he can repeat it, but he will be less successful in remembering if it was a self-adaptor which he had just performed. We believe

that illustrators are tied to the moment-to-moment verbal flow but that adaptors are not. We are in the midst of a joint study with Allen Dittmann (NIMH Laboratory of Psychology) to test that hypothesis.

Dr. Katz: Dr. Ekman, have you engaged in any cross-cultural studies of illustrators?

Dr. Ekman: Most of our cross-cultural studies have been on facial expression of emotion, not on hand movement. These studies were concerned with the universality of facial expressions of emotion and not with individual differences in relation to personality. Our cross-cultural studies of hand movements did not examine illustrators or adaptors but instead what we call *emblems*, movements that have a precise, almost dictionary-like verbal meaning known by all members of a culture or subculture. As with our study of facial expressions, our investigation of emblems was concerned with universals and cultural differences and not with individual differences within a culture.

It would be very interesting, I think, to study the occurrence of illustrators and self-adaptors in depressed patients from other cultures. It would also be interesting to study the differences between the face and the body and the occurrence of illustrators and self-adaptors in deceptive interactions in examining people from other cultures.

Dr. Kaufman: Dr. Ekman, how do you explain the finding that adaptors increase when a person is alone?

Dr. Ekman: My explanation is simply to note that people have been taught not to engage in some of these behaviors in the presence of others. For example, people learn not to clean their noses or their ears except when alone.

Dr. Kaufman: I would agree that this is probably one determinant. I think another explanation rests on the assumption that adaptors serve more than one function, and that they increase when the person is alone because they serve as a form of sensory input for the individual.

Dr. Dyrud: Dr. Kaufman touches on a very significant area, especially in view of research now being conducted on the organism's need for sensory input and the erection of stimulus barriers to ward off excessive input. For example, one often sees people on Forty-second Street or Eighth Avenue in New York engaging in a great deal of what looks like self-stimulation behavior. They are working with their fingers or blowing their noses or whatever. This intrigues me because I believe that when they leave the city and go to the country or more open spaces, this type of behavior drops off because they need this stimulus barrier less.

Dr. Ekman: Dr. Dyrud and Dr. Kaufman raise intriguing questions for which I wish I had relevant data. So far we have not had an opportunity to study people alone or in situations described by Dr. Dyrud. We have only observed psychiatric patients in the presence of interviewers, and in our studies of normal subjects, they have either been engaged in an interaction or if alone it was when watching a stress film.

Dr. Spiro: You have not mentioned observations of the lower extremities. Do legs and feet serve any illustrative function?

Dr. Ekman: We have a general theory about the difference between the face, the hands, and the feet. We believe that the face is the most explicit communicative tool. Some movements of the face may correspond in a rough way to hand illustrators. The microfacial expressions—the very brief ones—may give the same information obtained from the self-adaptors. The movements in the lower extremities more closely parallel the self-adaptors. We have not observed movement in the lower extremities that we would classify as "illustrator" in the sense that it seems tied to speech rhythm.

We find that if we show people the face and the body separately, we get negative correlations about the impressions they receive from these two sources if the person being observed is in any kind of message conflict. We reported an example of this earlier. In one interview a depressed patient had been concealing that she still had suicidal thoughts. When we showed a videotape segment to observers, those who saw the face picked up the positive message—the lie—and concluded that the person was feeling pretty good. The observers shown the body detected that the individual was upset, however. This finding with the depressed patient is consistent with our findings where we studied normal subjects who were asked to try to deceive an interveiwer about their feelings.

Dr. Klerman: If you can lie better with your face than with your body, then what about the old adage of "looking one straight in the eye" if you're going to tell the truth?

Dr. Ekman: The face-body distinction belies a more complicated state of affairs, for within the face there are subdivisions in terms of efficacy of communication. The facial musculature is sufficiently complex so that different messages can be displayed in different facial areas. We have hypothesized that when someone is lying, the lower facial musculature, far more than the eyelids, is used in the service of the lie. Thus, if somebody is lying to you and you want to pick it up, you are better advised to observe the eyelids than the lower facial musculature. We are just beginning to measure gaze direction. We may be able to verify the clinical adage that patients who are deceptive tend to look away from the interviewer.

Dr. Schmale: When depressed patients misidentify fear, what affective state do they most often confuse it with?

Dr. Ekman: When somebody fails to recognize an emotion on a T-scope, he usually applies the label of the emotion most similar in muscular movement. Thus, surprise is the most common error for a fearful face, disgust for an angry face, and sadness for a face showing disgust.

Dr. Schmale: I would have predicted that people would misidentify in the opposite direction. We have repeatedly observed that seriously depressed patients tend to ignore despairing scenes when they are given pictures to rate. We have shown depressed patients pictures of bleak and stormy scenes, and they

have reported that this is a "pleasant country scene." They seem repeatedly and consistently to deny the despair which is about them.

Dr. Ekman: Our evidence on this point is contradictory. In depressed patients, contrary to your expectation and to Tomkins' finding, there was no failure to recognize sad facial expressions accurately. Among the medical students who participated in our marijuana-alcohol study, the relationship that you predict did occur in that there was a negative correlation between self-rated feelings of dysphoria and accuracy in recognizing sad facial expressions. I cannot reconcile these findings. We are dealing with very different people; in one case those with an enduring affect disorder and in the other those with a transient drug-induced mood.

Let me emphasize once again that our findings on individual differences in the judgment of facial expression are tentative and at best hopeful. I would recommend that they be considered as not more than a possibility. In contrast, I have more confidence in our findings on the differences between the face and the body and in the relationships between the occurrence of illustrators and self-adaptors and psychopathology or the occurrence of deception. In these studies of individual differences in the encoding of nonverbal behavior our research has been guided by theory, and consistent findings have been obtained across very diverse samples of people (psychiatric inpatients and nursing students) and settings (standard psychiatric interviews and experimentally arranged honest/deceptive interactions).

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