

CURRENT ISSUES IN THE STUDY OF GESTURE

Introduction

The study of gesture has a long history. The earliest books devoted exclusively to it appeared at the beginning of the seventeenth century. In the eighteenth century, especially in France, gesture was looked upon as having great relevance for the understanding of the natural origin of language and the nature of thought. Condillac and Diderot, in particular, wrote about it quite extensively. In the nineteenth century gesture continued to command serious attention. Edward Tylor and Wilhelm Wundt both dealt with it at length. They believed that its study would throw light upon the transition from spontaneous, individual expression to the development of codified language systems. For much of this century, however, the study of gesture appears to have languished. The question of language origins, which has always provided an important justification for its study, fell into disrepute. Psychology neglected gesture because it seemed too much connected with deliberate action and social convention to be of use for the understanding of the irrational or to be easily accommodated in terms of behavioristic doctrine. It has been neglected by linguists because it has seemed too much a matter of individual expression. In any case it could not be accommodated into the rigorous systems of phonology and grammar with which linguists were preoccupied. Even the growth of interest in what came to be known as "nonverbal communication" did not stimulate the study of gesture as one might have expected. This was because the preoccupation here has been with how behavior functions communicatively in the regulation of interaction and in the management of interpersonal relations. Gesture is too much a part of conscious expression and too closely connected with the verbal for it to be of central relevance here.

Lately, however, things have begun to change. A revival of interest in speculation about the evolution of language, and in particular Gordon Hewes' discussions of the gestural origins

theory, the discovery that chimpanzees can be taught sign language and the development of the linguistic study of sign language itself, have all created a climate in which the study of gesture once again seems to be important. The interest that linguists have been showing in how language is used in interaction has led to a realization that, from a functional point of view, spoken utterances often only work because they are embedded in contexts of other forms of behavior, including gesture. Psychology has lately restored higher mental processes to centre stage in the array of topics it considers important, and so gesture, as a form of symbolic expression, is suddenly seen to be of interest.¹

In this lecture I am going to discuss a number of different issues in the study of gesture. I am going to try to point to some of the questions its study appears to raise. I shall talk in particular about the relationship between gesture and spoken language. I shall argue that gesture is a means for the representation of meaning that, in a fundamental sense is the equal of spoken language. I suggest that our tendency to be preoccupied with what can be expressed in words has led us to overlook the importance of gestural expression for a full theory of the human capacity for referential communication.

Defining Gesture

I will begin with the question of definition. What is a 'gesture'? A modern definition of 'gesture' (as given in the Oxford English Dictionary, for instance) is that it is a movement of the body, or any part of it, that is considered as expressive of thought or feeling. This is an extremely broad definition. At first sight it would seem to include practically everything that a person might do. However, a brief consideration of how the word is commonly used shows that the word 'gesture' refers to only certain kinds of bodily movements that are considered expressive of thought or feeling.

As commonly understood, 'gesture' refers to such actions as waving goodbye, or giving the thumbs up signal, or thumbing the nose at someone. It includes pointings and pantomimes that people sometimes engage in when they are too far away from one another to talk (or where talk would interfere). It includes the head waggings and arm wavings of vigorous talk, as well as the movements a person may improvise to convey something for which his words seem inadequate. However, there are other kinds of action which, though expressive, seem less appropriately called 'gesture'. For example, we would not say of someone who was weeping that they were engaged in gesture or, if we did, we would imply, I think, that the weeping they were engaged in was 'put on', that it was a show or a performance, and that it was not

wholly genuine as an expression of emotion. I also suggest that the term 'gesture' is not usually applied to the movements that people make when they are nervous, such as hair pattings, self groomings, clothing adjustments, and the repetitive manipulations of rings or necklaces or other personal accoutrements. In ordinary interaction such movements are normally disregarded, or they are treated as habitual or involuntary, and although they are often revealing, and may be read by others as symptoms of the individual's moods or feelings, they are not considered as 'gestures' as a rule.

Further, there are many actions that a person must engage in if he is to participate in interaction with others which, again, though they may be quite revealing of the person's attitudes and feelings are not regarded as gesture because they are regarded as being done for the practical necessities of interaction, and not for the sake of conveying meaning. Consider the movements that a person in interaction must engage in to establish, to maintain or to change his distance and orientation in respect to the other participants. The distance a person may establish between himself and his partner in interaction may often be taken as an indication of his attitude towards them or of his understanding of the nature of the interaction that is taking place. Such spatial and orientational movements are not considered as gestures, however, for they are treated as being done, not for their own sake, but for the sake of creating a convenient and appropriate setting for the interaction. Even when someone seems to edge closer to another than the other expects, or when they sit far off and do not move up, despite the far reaching consequences that may sometimes follow, such actions are not yet considered 'gestures' if, as is usually the case, they are done in a way that subordinates them to actions that must be done merely to maintain such spatial and orientational arrangement as is essential for the carrying out of a conversation.²

We may also note that practical actions are not normally considered gestures even when such actions play a part in social interaction. For example, when people have conversations, they may also engage in such activities as smoking or drinking or eating. The actions required for such activities may sometimes be used as devices to regulate the social interaction. People who meet for talk over coffee and a cigarette may vary the rate at which they drink up their coffee or smoke their cigarette as a way of regulating the amount of time to be spent in conversation. Lighting a cigarette or re-lighting a pipe can often be elaborated as a way of 'buying time', as when a person needs to think a little before he replies. Yet, despite the communicative significance such activity undoubtedly may have, it is not typically treated as intended to communicate anything. To spend time getting one's pipe ready to light up is to take 'time out'

of a conversation; it is not to engage in a conversational move or turn, even though it may play a part in structuring the moves or turns of which the conversation is composed.

The actions of smoking, or of any practical action, may be performed in ways that can be highly expressive, however. There are many different ways in which smoke may be exhaled, for example -- in a thin and elegant jet, in untidy clouds; it may be directed at people or away from them. One may wave one's cigarette about in elaborate balletic movements; one may stub it out with force or with delicacy. Practical actions, thus, may become embellished with flourishes to the point that their expressive dimension may be openly recognized. As this happens, they come to take on the qualities of gesture.

If practical actions can be given some of the qualities of gesture, it is also possible to observe that gestures may sometimes be disguised so that they no longer appear as such. It has been reported that in Germany there is a gesture in which the forefinger touches the side of the head and is rotated back and forth. It is used to mean "he's crazy", and it is regarded as a grave insult. Its use has been the cause of fights, and one may be prosecuted for performing it in public. A surreptitious version of it has appeared, however, in which the forefinger is rotated in contact with the cheek. In this version the gesture is performed in such a way that it could be mistaken for scratching the cheek or for pressing a tooth that was giving discomfort. Likewise, in Malta, the gesture known as the Italian Salute, or the bras d'honneur, is regarded as so offensive that one can be prosecuted for performing it in public. Apparently the Maltese have evolved a way of performing this gesture in such a way that it could be mistaken for a mere rubbing of the arm, and not as a gesture at all. In this version the left arm is held straight with the hand clenched in a fist, while the right hand gently rubs the inside of the left elbow.³

Such examples are of interest because they make it clear that participants are able to recognize, simply from the way in which the action is performed, whether it is intended as a communicative action or not. Apparently, for an action to be treated as a 'gesture' it must have features which make it stand out as such. Such features may be grafted onto other actions, turning practical actions or emotional displays into gesture. Such features may also be suppressed, turning movements from gestures into incidental mannerisms or passing comfort movements.

A few years ago I conducted a study to explore the question of how ordinary perceivers perceive actions.⁴ I wanted to find out whether or not people did consistently recognize only certain aspects of action as belonging to gesture. In this study twenty

people were each shown, individually, a film of a man giving a speech to a fairly large group of people. The film had been made among the Enga, who live in the Western Highlands of Papua New Guinea. The people who watched the film were all Caucasian, English speaking Australians and none of them were students of psychology or of any other behavioral science. The film was about four minutes in length and I showed it without sound. I asked each person to tell me, in his own words, what movements he had seen the man make. Each subject was allowed to see the film as many times as he liked and, in discussing his observations, I was careful to use only the vocabulary that he himself proposed. The aim was to find out what movements the subjects picked out in their descriptions and to find out what different sorts of movements they identified.

In the course of the film the man who was speaking engaged in elaborate movements of his arms and head, he walked forward, he manipulated the handle of an axe he was holding, he tugged at his jacket, he touched his face and nose. All subjects, without exception, first said that they saw movements which, they said, were deliberate, conscious, and part of what the man was trying to say. All subjects also said that they saw some other movements which, they said, were just natural, ordinary, or movements of no significance. Thus not only was a sharp distinction drawn by all twenty people between 'significant' movements and other movements, all twenty mentioned these 'significant' movements first, and only later (and sometimes only after some probing) did they mention that they had seen some other movements.

When asked to indicate where these different movements were seen to occur, all subjects were able to do this without any hesitation, and there was very considerable agreement as to which movements were considered a 'significant' part of what the man was trying to say and which were 'natural' or 'ordinary' or of no significance. Thus thirty-seven movement segments were commented on. In all cases a majority of subjects assigned them to either the 'gestural' or the 'natural' category, and there were only four segments in respect to which more than five out of the twenty subjects differed from the majority in how these movements were to be assigned.

A consideration of the characteristics of the movement segments selected as part of the orator's deliberate expression as compared to those selected as 'natural' or 'ordinary' or of 'no significance' allows us to arrive at some understanding of the features of deliberately expressive movement, as compared to other kinds of movement.

Deliberately expressive movement was movement that had a

sharp boundary of onset and that was seen as an excursion, rather than as resulting in any sustained change of position. Thus for limb movements, those movements in which the limb was lifted sharply away from the body and subsequently returned to the same position from which it started, were seen as deliberately expressive. In the head, rotations or up-down movements were seen as deliberately expressive if the movements were rapid or repeated, if they did not lead to the head being held in a new position, and if the movements were not done in coordination with eye movements. If they were, then the observers would say that the man was engaged in changing where he was looking and this was considered different from movements that were part of what he was saying. Movements of the whole body would be regarded as part of the man's deliberate expression if it was seen as returning to the position from which it began, and not resulting in a sustained change in spatial location or bodily posture.

Movements that involved manipulations of an object, such as changing the position of an object, were never seen as part of the man's expression. They were usually referred to, if noticed at all, as 'practical'. Movements in which the man touched himself or his clothing were also never regarded as part of deliberate expression. These movements were, by almost all subjects completely overlooked at the outset, and dismissed as 'natural' or 'nervous' or 'of no importance' when they had their attention drawn to them.

These twenty observers were doing what all of us normally do in our dealings with others. Like all of us, they were attending to the behavior of another in a highly differentiated way, and what stood out for them, what was most salient and worth reporting were those movements which shared certain features which identify them, for the observer, as deliberate and, in this case, intended as communicative. Just as a hearer perceives speech whether comprehended or not as 'figure' no matter what the 'ground' may be, and just as speech is always regarded as fully intentional and intentionally communicative, so I suggest that if movements are made so that they have certain dynamic characteristics they will be perceived as 'figure' against the 'ground' of other movement, and such movements will be regarded as fully intentional and intentionally communicative. I suggest that we may recognize a number of features that a movement may have -- features which, for the sake of a name I shall refer to as the features of manifest deliberate expressiveness. Any movement a person produces may share these features to a lesser or greater degree. The more it does so, the more likely is the movement to be given privileged status in the attention of another and the more likely is it to be seen as part of the individual's effort to convey meaning. What we normally call 'gesture' are those movements that partake of these features of

manifest deliberate expressiveness to the fullest extent. They are movements at the extreme end of the scale, so to speak. The word 'gesture' serves as a label for that domain of visible action that participants routinely separate out and treat as governed by an openly acknowledged communicative intent.

I say "openly acknowledged communicative intent" because, as my discussion of smoking or of the illegal German and Maltese gestures reminded us, it is possible to engage in movements deliberately for the interactional effects they may have, but to do so in such a way that they will not be treated as deliberately communicative. Indeed, we do this all the time, and I believe that our ability to do this, and our willingness to treat the behavior of others as if it may be differentiated in this way is an important component of our abilities to engage in daily interaction adequately.⁵

It is worth noting, in this connexion, that whereas it is possible for me to produce a movement which is ambiguous in its deliberate expressiveness, it is not possible for me to do this with speech. I either say something or I do not. If I say something that you can't quite make out, it yet remains that I undoubtedly said something and if you are my partner in an interaction, it is your right to challenge me and to ask, "What did you say?" Gestures are rarely challenged. I can make movements which might or might not be gestures, but very rarely am I allowed to make noises that might or might not be speakings. I should be most interested to know whether this also is true in sign language interactions. Can I, in a sign language interaction, produce movements which might or might not be signings, or is there a way in which certain movements are always assigned in intentional discourse, while other movements are permitted the sort of ambiguity that we find is permitted for the movements made by speakers? It seems to me possible that when, for sign language users, all expression must be in one modality, it is more difficult to engage in the kind of 'unofficial' communication that is routine for hearing interactors. Perhaps this is why it is often said that deaf signers are so 'open' to one another in their conversation and give expression to their feelings so readily.⁶ They are so because they have no choice. They cannot, as we speakers can, draw the kind of sharp distinction between definite, deliberate utterance, and something that can vary in its definite deliberateness that the availability of both speech and gesture permits.

Now although, as I have suggested, it is possible for people to modify their performance of gestural acts so that they do not look like gestures, and although they can add features to non-gestural actions to give them some of the character of gestures, this remains a capacity of performance that interactants make use

of in their management of behavior or in interaction. It does not alter the proposal that participants effectively operate with one another in terms of a notion of bodily movements that are clearly part and parcel of the individual's openly acknowledged intention to convey meaning. It is to this that I apply the term 'gesture'. I have proposed an approach to an understanding of how that term may be defined which comes at it from the point of view of the participant in interaction. I have suggested that 'gesture' is behavior that is treated as intentionally communicative and that such behavior has certain features which are immediately recognizable. I have suggested that there are other aspects of behavior which have other characteristics which as a result are seen as 'incidental' or 'practical' and which are treated as quite distinct from 'gesture' notwithstanding the role they can be shown to play, and are often deliberately employed to play, in the organization of interaction.

It would appear, then, that participants perceive each other's behavior in terms of a number of different systems of action -- the deliberately communicative or gestural, the postural, the practical, the incidental and, perhaps, although I have not explored this specifically -- the emotional. We have also reason to suppose that these different streams of action are produced under the guidance of different systems of control. Actions that are treated as 'gestural', it appears, are intimately associated, in their production, with the actions of spoken utterance, while actions that are treated as belonging to other functional systems appear to be differently produced.⁷ It is here, indeed, that neurological investigation could provide much useful information. A number of studies of aphasia have appeared in recent years that have explored the relationship between impairment of spoken language abilities and impairment of certain aspects of gesture -- in particular, the ability to produce and to recognize pantomimes.⁸ The evidence from these studies seems to suggest a rather close association between such gestural abilities and abilities with spoken language. What these studies have much less frequently addressed is the extent to which the overall interactive competence of brain-damaged patients is impaired. A few authors have pointed out that aphasics are often capable of dealing quite well with all the regulatory aspects of interaction -- they can maintain an appropriate spacing and orientation, they recognize when it is their turn to make a conversational move. Their impairment lies in their ability to mobilize speech and gesture to produce coherently meaningful units of utterance. Duffy and Buck at the University of Connecticut have shown, for instance, that left hemisphere damaged aphasics, while impaired in their abilities to produce and to recognize pantomimes in proportion to the degree of their impairment in verbal language, are not significantly different from normals, or, indeed, from right hemisphere-damaged

patients, in their production of appropriate and coherent facial expressions of affect. Markel and his colleagues in Florida have reported a study in which they have shown that aphasics show little impairment in those aspects of behavior that communicate emotional states, attitudes, relative status in the interaction, and the regulation of turn-taking. Gardner and his colleagues in Boston have reached a somewhat similar conclusion. All of this supports the view that 'gesture' is indeed to be distinguished from emotional expression, and from those aspects of behavior that serve in the structuring and regulation of face-to-face interaction.⁹ I suggest as a possibility worth further exploration, then, that as percipients we differentiate the behavior of others into a number of different action systems and attend to them differentially, accordingly; as actors we organize and produce behavior also in terms of a number of different systems, and that systems of action as produced, and systems of action as perceived, are mutually coordinate.

Types of Gesture

If the notion of 'gesture' is to embrace all kinds of instances where an individual engages in movement whose communicative intent is paramount, manifest and openly acknowledged, it remains exceedingly broad. Most who have written on the subject in recent years have offered classifications, suggesting various types of gesture. There is much variation in the terms employed, as one might expect; however, a review of these classifications suggests fundamental agreement. All writers recognize that gesture may function as utterance autonomously, independently of speech, and most have proposed a special class of gesture to cover this. There is also recognition that gesture that occurs in conjunction with speech may relate to what is being said in a variety of ways. Thus most draw a distinction between speech associated gesturing that somehow provides a direct representation of some aspect of the content of what is being said, and gesturing that appears to have a more abstract sort of relationship. David Efron, for example, distinguishes as "physiographic" those speech related gestures that present a sort of picture of some aspect of the content, and he terms "ideographic" those speech related gestures which, he says, are "logical" in their meaning and which portray not so much the content of the talk as the course of the ideational process itself. More recently we have Norbert Freedman who distinguishes "representational gestures" from non-representational or "speech primary gestures"; we have Morton Wiener who distinguishes "pantomimic" gestures from "semantic modifying and relational gestures," and David McNeill who distinguishes "iconic" gestures, "metaphoric" gestures and gestures which seem to be related only to rhythmic structure of the speech, which he has termed "beats". Gestures of this sort

have also been recognized by Efron and by Paul Ekman under the terms of "batons".¹⁰

For the purposes of the present lecture a few distinctions will be needed. I shall refer to all gesturing that occurs in association with speech and which seems to be bound up with it as part of the total utterance as gesticulation. The particular kinds of relationship between gesticulation and the speech it is associated with will be discussed on their merits, and I shall attempt no classification of this in advance. Gestures which are standardized in form and which function as complete utterances in themselves, independently of speech, I shall refer to as autonomous gestures (this includes those forms that are quite often referred to today as emblems). It must also be recognized that under certain circumstances gesturing can come to be organized into what I shall refer to as a gesture system and, in circumstances where complete generality of communicative function is required, we observe the emergence of sign languages.¹¹

One further distinction. It is to be noted that the main concern of those who have dealt with gesture has been with what might be called its discourse or propositional functions. However, it should be recognized that there are many kinds of gesture that function in the management of interaction. For example, there are those gestures of greeting, of request, command, assent and refusal. One author has proposed that gestures functioning in this way should be treated separately.¹² There are some grounds for thinking that such gestures may differ in their developmental history from gestures of discourse. They may emerge earlier, and they may be related to somewhat different functional capacities from those that serve to represent the contents of discourse. I shall not deal further with gesture of this sort in this lecture. However, I would like to draw attention to this distinction and I would like to ask whether there is any sort of neurological evidence to support it. For example, do left hemisphere-damaged aphasic patients, showing impairment in their pantomimic abilities, also show impairment in their abilities to deal with gestures of interactional management, or can they function as well with these gestures as they can with the posturings, positionings, and other features of behavior in a social encounter which serve in its regulation as an interactional event, regardless of the actual contents of the utterances that are exchanged?

It is worth noting, incidentally, that in conversational contexts, at least, gestures of interactional management are done mainly with the head and face, rarely with the hands. Thus gestures of assent and refusal and those gestures by which a listener lets the speaker know how what he is saying is being received are done mostly with the head. In the speaker, the head

may be used in gesturs of assent and negation which may accompany speech. It may also be used in pointing. Otherwise its gesticulatory role appears to be largely confined to discourse segmentation functions. The face may also play a role in discourse segmentation, but it also serves in the representation of content, although it is restricted largely to the representation of content of particular sorts, mainly content that has to do with feelings and with social role.¹³ In a preliminary study in which the gesturing of people telling the story of Little Red Riding Hood was examined, it appears that when the story teller takes the role of the Grandmother, of Little Red Riding Hood, or of the Wolf, and utters their words in their voices, the face is used in consistently different ways to portray the different characters, but hand gestures are not used. Events that are narrated, on the other hand, are often accompanied by hand gestures. These are used to depict actions and also to portray the spatial structuring of situations. We may expect, I think, that head and face gesturing have somewhat different functions from forelimb gesturing -- although much more work is needed before we can talk with much confidence about this.

Gesticulation

Gesture, at least of the propositional or discourse sort, is widely regarded as being somehow closely related to spoken utterance, although the nature of this relationship has been interpreted in a number of different ways. The view I shall develop here supposes that gesture, like speech, serves as a vehicle for the representation of meaning. Gesture comes to be closely associated with speech because it is being used for the same purposes. I suppose that one should begin by thinking of the individual who proposes to produce an utterance as wanting to make some meaning available for others. Accordingly, a unit of action is organized that will do this. In organizing such a unit of action, the individual will make use of whatever vehicles for meaning representation there are available. These include spoken language, but also included is the possibility of representing meaning through visible action, which I here call gesture. The individual may have available to him a variety of conventionalized forms, already highly coded with established shared meanings, or he may not, in which case he may have to resort to the production of improvised forms of action. On this view it will be seen that gesture is viewed as a separate vehicle for the representation of meaning, quite independent of speech, but that it comes to be closely associated with speech because it is employed, along with speech, in the service of the same intentions. Gesture and speech are, thus, partners in the same enterprise, separately dependent upon a single set of intentions. Their close association does not come about because one is

somehow a by-product of the other. It arises because they are being employed simultaneously in the service of the same overall aim.

In developing this view I shall examine recent studies of gesticulation, recent studies of the development of gesture in children, and some of the recent neurological work. Then I shall discuss some observations on how participants in conversational interaction make use of gesture.

If one observes manual gesticulation in a speaker, it is possible to show how such movements are organized as excursions, in which the gesticulating limb moves away from a rest position, engages in one or more of a series of movement patterns, and is then returned to its rest position. Ordinary observers identify the movement patterns that are performed during such excursions as 'gestures'. They see the movement that precedes and succeeds them as serving merely to move the limb into a space in which the gesture is to be performed. A Gesture Phrase may be distinguished, thus, as a nucleus of movement having some definite form and enhanced dynamic qualities, which is preceded by a preparatory movement and succeeded by a movement which either moves the limb back to its rest position or repositions it for the beginning of a new Gesture Phrase.

If the flow of gesticulatory activity is thus analyzed into its component Phrases, and these phrases are plotted out on a time-based chart against a time-based transcript of the concurrent speech, it is found that there is a close fit between the phrasal organization of gesticulation and the phrasal organization of the speech. For example, if the flow of speech is segmented into Tone Units (which are phonologically defined syllabic groupings united by a single intonation tune), it is usually found that there is a Gesture Phrase to correspond to each Tone Unit.

A Tone Unit, as I have mentioned, is a phonologically defined unit of speech production; however, it matches quite closely units of speech that may be defined in terms of units of content or 'idea units'. The association between Gesture Phrases and Tone Units arises because Gesture Phrases, like Tone Units, mark successive units of meaning. Gesture Phrases are not, thus, by-products of the speech production process. They are directly produced, as are Tone Units, from the same underlying unit of meaning. There are several observations that can be adduced to support this. Thus it is found that Gesture Phrases are often begun in advance of the Tone Unit to which they are related, and they are often completed before the Tone Unit's completion. The 'stroke' of the Gesture Phrase never follows the nucleus of the Tone Unit. Thus Gesture Phrases must be organized at the same

time as Tone Units, if not a little in advance of them. Further, when there is a disruption in the flow of speech within a Tone Unit, this typically occurs before the production of the nucleus, that is, before the production of the high-information words. Such disruptions are often attributed to some failure in the process of word retrieval. If a Gesture Phrase is in progress at the moment of such a disruption, one finds that the Gesture Phrase is not interfered with; it continues to completion with perfect coherence. In such cases it is possible to see how the 'idea' is fully available and is serving to govern the production of gesture, although there has been an interruption in speech production. Sometimes both speech and gesture are interrupted, of course, and one may observe an individual producing a succession of incomplete Gesture Phrases at the same time as he produces a succession of incomplete phrases of speech. In these cases, however, disruption is at a deeper level, for here the ideas to be expressed have not yet been organized.

So far, I have been quoting from my own investigations.¹⁴ Recently David McNeill of the University of Chicago has published studies of gesticulation which are closely in accord with these observations.¹⁵ However, his work is much more extensive, and he has approached his analysis from a slightly different point of view. In one analysis he examined what he called gestures (defined in a way that is quite similar to my notion of the Gesture Phrase) in terms of the relationship they exhibit with the conceptual structure of the concurrent speech. He found a close fit between the occurrence of a gesture and the occurrence of a speech unit expressing whole concepts or relationships between concepts. In further analyses McNeill reports that the 'peak' of the gesture (that is to say, the most accented part of the movement, which I call the 'stroke') coincides with what was identified as the conceptual focal point of the speech unit. McNeill has suggested that each new unit of gesture, at least if it is of the sort that can be considered representational of content, appears with each new unit of meaning. Each such gesture manifests, he suggests, a representation of each new unit of meaning the utterer wishes to present.

We may conclude that these studies of how gesticulation is related to the speech it accompanies indicate that it is organized separately, but brought into coordination with speech because it is being employed in the service of the same overall aim. The detailed rhythmic coordination of gesticulation with speech arises at the level of the organization of the execution of motor acts. The forms that gestures assume are organized directly from original conceptual representations in parallel with linguistic forms, but independently of them.

Let me now turn to some consideration of studies of the

development of gesture in children. From what has been done so far, it appears that the child's capacity to make use of gesture expands in close association with growth in his capacity for spoken language. However, the way in which children use gesture appears to be different from the way it is used by adults. It seems that in adults gesture is used in relation to speech in a much more precise and specialized way. It appears that, with age, there is an increase in the degree to which the two modalities are coordinated.

Recent longitudinal studies of social interaction of the very young with their mothers show that the gestured actions which provide the first evidence of the ability of the child to engage in language-like communication, far from being replaced as the capacity for speech emerges, expands, and elaborates. Elizabeth Bates is quite explicit on this point. In summarizing her longitudinal study of twenty-four children between the ages of nine and fourteen months, she writes: "Our findings do not support a model of communicative development in which preverbal communication is replaced by language." Language and gesture, she says, "are related via some common base involving both communication and reference." As this common base develops, the capacity for using both gesture and speech develops. A similar conclusion has been reached in other longitudinal studies. Wilkinson and Rembold write, for instance, that "as children become more aware of grammar and more facile at expressing it verbally, they also become more skilled in expressing grammar gesturally."¹⁶

Studies of gesture in older children have, for the most part, concentrated on the evidence this can provide about changes in the child's capacities for symbolization, and they do not address the question of the spontaneous employment of gesture in relation to speech. There are four recent studies that do, however. Each has been conducted independently of the other, and they all appear to suggest a very similar picture. I refer here to a study by Norbert Freedman of changes in gesturing with age as children provide definitions of common words; to studies by David McNeil and by Morton Wiever and his students of gesturing in children of different ages as they retell the story of an animated cartoon they have watched; and to a study by Evans and Rubin of children between the ages of five and ten years as they explained to an adult the rules of a simple game they had just been taught.¹⁷ Evans and Rubin looked at the nature of the gestures the children employed and the role these gestures played in making the explanations intelligible.

Taken together, these four studies are consistent with one another in a number of respects. All agree in noting an increase in gesticulation with age. All of them indicate, however, that

there are important changes in the kinds of gesticulation that occur and in the way these gesticulations are related to speech. There appears to be a shift away from elaborate enactments or pantomimes, which serve instead of speech, towards a use of gesture that is more selective and which is more closely coordinated with what is being said in words. Thus Freedman described how the four-year-old, as he attempts to offer a definition of a word such as "hammer" may first pantomime the use of the hammer before attempting a verbal definition. A ten-year-old gestures elaborately while he is talking as if, as Freedman puts it, he "surrounds himself with a visual, perceptual and imagistic aspect of his message." The fourteen-year-old, on the other hand, uses gesture selectively, usually only in relation to specific words, with which the gesture is highly coordinated. Likewise, McNeill describes how children under the age of eight enact whole scenes and that they do not relate their words and gestures. In adults, in contrast, 'iconic' gestures tend to be precisely coordinated with spoken units of meaning; furthermore, these gestures become more symbolic in the adult, serving as signs of actions or events. There is no attempt, as there is in the child, to engage in total re-enactments.

These studies suggest, thus, that the employment of gesture for the representation of meaning increases in its elaborateness as the child gets older, but that at first it is used separately from speech. Later, as the child's command of speech develops, gesture comes to be used in conjunction with it. It is as if there is an increasing convergence and coordination between the two originally separate forms of expression.

Analyses of how gesticulation is organized in relation to speech and analyses of changes in how gesture is used by children both are compatible with the view that gesture and speech must be considered separate representational modes which may nevertheless be coordinated and closely associated in utterance because they may be employed together in the service of the same enterprise. Recent neurological studies can also be cited to support this view. As mentioned earlier, there are a series of reports available which show that in left hemisphere-damaged patients there is a good correlation between degree of impairment in speech usage and comprehension and degree of impairment in ability to both produce and comprehend pantomimic gestures. Furthermore, as a recent study by Howard Gardner and colleagues has shown, gesticulation is also altered in cases of aphasia in ways that are quite parallel to the alterations in speech.¹⁸ However, there are also reports of left hemisphere-damaged patients in which although there is impairment in aural aspects of language, reading ability and pantomimic ability are not impaired. It is in these patients, apparently, that it may be possible to show that training in use of some form of gesture

language, such as Amerind Sign Language, may be beneficial.¹⁹ As I understand the implications of these reports, they suggest that visual symbolic abilities are neurologically separable from aural symbolic abilities. It is possible to impair one, but not the other. However, because so often both are impaired to the same degree, this suggests that the two kinds of abilities are separately subsumed under a more general function.

Functions of Gesture

I now want to turn to a consideration of what gesture may be used for. If, as I suggest, gesture is employed for the same purposes for which speech is employed, I mean this in a very broad sense. I mean by this that gesture and speech are both employed in the task of the production of patterns of action that may serve for others as representations of meaning. I do not mean that they serve this task in the same way. When speech cannot be used, circumstances may make it possible for it to come about that gesture can be organized to do all of the things that speech can do. Where speech is available, then we find that gesture and speech are employed differently, in complementary roles, speech serving one set of communicative functions, gesture another.

Gesture and speech are very different from one another. In particular, because gesture employs space as well as time in the creation of expressive forms, where speech can only use time, the way in which information may be preserved in the two media is very different. Furthermore, it seems likely that important differences may arise from the fact that gesture is a visual medium, where speech uses sound. This may mean that the impact of gesture on a recipient may sometimes be very different from the impact of speech.

Given these different properties, we may expect that, where both modes of expression are available, they will be employed to service different components of the overall aim of the utterance. Let me illustrate what I mean here by a specific example. This example comes from a collection of instances of gestural usage that I have been maintaining for some time now, for the purposes of developing a more systematic understanding of how speakers employ gesture.

As many of you are no doubt aware, the New York Times, on Sundays, is very large and heavy. This always surprises an Englishman, when he sees it for the first time, for Sunday newspapers in Britain are very much thinner. An Englishman long resident in the United States one Sunday morning at a railroad station fell into conversation with a compatriot who had arrived only the week before. In the course of exploring his reaction to

things American the resident Englishman said: "Have you seen the/GESTURE/New York Times?" Precisely in association with "seen the" the speaker first placed his two hands forward, palms facing one another, he then placed them one above the other, palms facing downwards, thereby depicting a thick oblong object. The newly arrived Englishman laughed in response and immediately commented on the enormous size of the paper.

There are two things to note about this example. First of all, the sentence, "Have you seen the New York Times?" is fully formed grammatically, and it is semantically perfectly acceptable. Yet we could not understand the way in which it was responded to here unless we had access to the gesture associated with it. Thus, to understand the meaning of the utterance in this situation, we have to consider speech and gesture together. Furthermore, it will be noted that the gesture was performed exactly over the words "seen the". It must be seen that the gesture was thus an integral part of the entire utterance plan from the very first. The utterance, in its construction, thus, had both verbal and gestural components.

The gestural component, it will be seen, was the component by which the size and shape of the New York Times was referenced. Obviously, this could have been done verbally -- the speaker could have said, "Have you seen how big the New York Times is?" Here, however, the reference was made to the size of the newspaper by gesture. By employing gesture for this purpose, the speaker was able to refer to just that aspect of the Sunday New York Times which always surprises an Englishman. This surprising feature is a visual feature, and by using the same modality of sense perception that his recipient used when he first encountered it, he thereby provides him with a depiction that will remind him quite directly of that first surprising moment. It would appear, thus, from this example, that not only was the utterance planned as an integrated unit with gestural and verbal components but that, further, there was a differentiation of function between these two components, a differentiation of function that must also have been part of the utterance plan.

There are many other ways in which gesture concurrent with otherwise coherent speech may be used. For example, it may be used to disambiguate possibly ambiguous words. Thus, in a context where the word "minolta" could have meant either a still camera or a movie camera, as the speaker said, "You could do it with your Minolta," over the word "minolta" he provided a gestural enactment of holding a camera and pressing the shutter, thereby making it clear that it was the still camera he had in mind. In another example, someone is talking about some photographs he had seen to another, who, on a different occasion, had seen the same display. The speaker said, "I liked the one of

the window." As he said this, he moved his extended finger in an arc in front of him, and this served to establish that it was a photograph in a curved structure that he was referring to. A father, home from work, talking with his wife in the living room about what the children had done that day, said: "They made a cake, didn't they?" As he said "cake", he tilted his head to his left, in the direction of a window overlooking the garden where, earlier in the day, the children had made a cake of mud. In all of these examples, as with the New York Times example, the meaning conveyed by the gesture could as easily have been conveyed in words. The speakers could have said: "You could do it with your Minolta one-oh-one"; "I like the one of the window in the curved building"; "They made a cake in the garden, didn't they?"

However, in each case a component of the meaning of the total utterance was assigned to gesture for representation. In the New York Times example it appears that reference to size and shape was assigned to gesture to evoke the listener's response to a visual surprise. In the Minolta example, employing gesture to disambiguate a word may have served to economize on the time available for the speaker's turn. Meaning components of utterances may get assigned to gesture for various reasons; thus, it seems that the utterer is able to employ gesture and speech together, but in a differentiated way, each modality playing a role complementary to the other in the production of a well-designed utterance.

In other examples we can observe how a gestural element is used in alternation with speech. In these cases we may see how it does duty as if it were a spoken element. Tatania Slama-Cazacu of Bucharest drew attention to this and used the term "mixed syntax" to refer to it. Ray Birdwhistell, in his discussion of what he has called "kinesic markers" has also drawn attention to it, and Joel Sherzer, in his analysis of the use of the pointed lip gesture among the Cuna Indians of Panama has shown how this gesture would often be used to stand in for deictic words or for labels for objects or places being referred to.²⁰ He argued that it should be given a place in the lexicon of the spoken language. From my own collection I can draw many instances of this, and in many cases it is possible to see how the substitution of a gestural element for a spoken element served well in the circumstances in which the utterance was being used. Thus I have examples of people repeating part of what they have just said gesturally because a momentary increase in ambient noise made their speech inaudible or because, in another example, their recipient failed to understand them because he was unfamiliar with the accent with which they spoke. In other cases one may observe gesture standing in for a spoken element where no established spoken element is available. Thus a video-tape of a

student choreographer working with a small troupe of dancers that I have shows how she frequently uses partial enactments of the movement patterns she wants her dancers to employ as if they were verbal labels. Later, the movement patterns in question acquire verbal labels, and then she no longer uses enactments in this way.

In yet other cases one may observe gesture being used as an alternate for speech within an otherwise spoken utterance where there is some question of the propriety of what is to be said. One of the properties of gesture seems to be that it can be treated as somehow less official, less a full-fledged way of saying something than can speaking. I alluded to this much earlier in discussing the definition of gesture, and I suggest it may have something to do with the fact that gestures may be varied in their explicitness in a way that speech cannot. In one of my best examples of "mixed syntax", a host suggests to a guest, too early in the evening, that it is time for him to drive him home. He says to the guest, after offering him a second cup of coffee, but declining to pour one for himself, "I was up much too late last night, so maybe we oughta/GESTURE" -- for the gesture putting up his two index fingers and holding them parallel to one another, moving them together in an up-down movement in the direction of the door. In another example a boy came to ask his father for something he was afraid his father would not let him have, and to refer to it, he used a gesture instead of naming it.

I will not go on here. These few examples must suffice to make the point that gesture, as it is used by speakers, is not more primitive than speech, it is not used only for emotional purposes, it is not a mere by-product of the speech production process, it is not a mere paralinguistic decoration we can easily do without, and it is not in any way 'redundant' or merely illustrative. On the contrary, I suggest that gesture is employed by speakers as a complement to speech, serving in cooperation with it in the elaboration of a total utterance. Often it is used in this way with considerable sophistication, the utterer displaying a clear understanding of the relative merits of the communicational properties of the two media of expression he has at his disposal.

My anecdotes will suffice, I hope, to make this point, but we badly need careful systematic exploration here. Rather to my surprise, I find almost nothing has been done.²¹ There are doubtless many reasons for this. However, I would like to mention one of the difficulties that stand in our way. This is that people, on the whole, are highly skilled in adapting the organization of their utterances to the nature of the communication situation. This means that a simple experimental

approach to the study of the communicative value of spontaneous gestural usage by speakers is quite difficult to devise, for by altering the access speakers can have to gestures, one finds they adjust readily what they say -- this is why observations on conversations on the telephone or conversations in the dark can prove nothing. Secondly, as my survey of anecdotes is also intended to remind you, the functions of gesture are extremely diverse. We cannot approach this subject with any simple hypotheses about what functions gesture has. At this stage I believe a natural history of gestural usage is what is needed, a natural history that would rely upon the careful analytic description of numerous recorded examples.

The view of gesture I have been putting forward in this lecture has a number of implications. First, it seems to me, it should lead to some dethronement of spoken language. That is to say, it should lead to a view in which spoken language forms are regarded as no 'deeper' than other forms by which meaning may be represented. As Teodorsson has suggested in a recent discussion, spoken language is but one kind of manifestation or 'delogical' form of the representational process.²² There is no doubt that spoken language has been elaborated into a communicative code of extraordinary flexibility and generality. However, this is an elaboration that has come about because spoken language has been chosen as the instrument for main use, so to speak. As the phenomena of primary sign languages make it clear, gesture can also be elaborated into a flexible and functionally general communicative code to a degree that is quite comparable to spoken language, if circumstances are appropriate. Among the circumstances required, it should be noted, is the existence of a communication community in which gesture, rather than speech, is the main modality, and it is further important that such a community be fairly large and that it persist through time. In the past there has been much discussion about the limitations of sign languages. It is my belief that these are, in principle, no more limited than spoken languages. Hitherto communities of sign language users that are large enough and that have persisted for long enough have not been available for study. As the brief history of American Sign Language makes clear, such languages can be elaborated, given enough time, and given a large enough community of users.²³

Secondly, I believe that the view of gesture I have here been advocating will have important implications for theories of mental representation. It will be seen that since gestural expressions are fully integrated with spoken aspects, they must be planned for together at the outset. This means that, however ideas are stored in our heads, they must be stored in a way that allows them to be at least as readily encoded in gestural form as in verbal form. The issue of the mental representation of ideas

has been the subject of some debate recently. There are those who maintain that ideas are represented in an abstract propositional format that is the same as the format used to encode verbal information. On the other hand there are those who believe that the representation of ideas is modality specific and that visual ideas are encoded in terms of structures that are spatial and that are analogous transforms of the things they represent. In a review of these positions, Anderson concluded that at the present time it will not be possible, using the techniques available in experimental psychology, to decide whether all ideas are encoded propositionally or whether they may be encoded somehow 'pictorially' as well. Either hypothesis, he argues, accounts equally well for current experimental findings.²⁴ Here it is suggested that the observation that gesture is deployed as an integral part of utterance shows that any theory of representation that gives primacy to a representational format modeled on spoken language structures will not do. A close examination of how gesture and speech are deployed in an utterance makes it clear, as I have tried to show, that meanings are not transformed into gestural form by way of spoken language formats. They are transformed directly and independently. Thus such meanings, however they are stored, are stored in a way that is separate from the formats of spoken language, however abstractly these may be conceived.

Before concluding, let me remind you of several important topics I have not had time to deal with. I have said nothing about cultural differences in gesticulation. It is widely supposed that there are large cultural differences, and this seems to be the case. Surprisingly, there is still only one study that has documented this in any detail. I refer to the study of David Efron, published in 1941, in which he made detailed comparisons between the gesticulatory styles of Southern Italians as compared to East European Jews. One of his most interesting findings was that whereas the Southern Italians made extensive use of 'pictorial' gestures -- to the extent that, as Efron put it, it was almost as if the speakers illustrated their talk with slides -- the Jewish speakers used gestures that were quite abstract in their relationship to the content of their speech. What this suggests is that, for both groups, gesticulation was used extensively in talk, but that the cultures differ in the kinds of information it is relied upon to provide. Experimental studies by Graham and Argyle and by Walker and Nazmi have shown that Italians do rely upon gestures for information about the visual appearance of things to a greater extent than do British people.²⁵ The survey of autonomous gestures in Europe recently published by Desmond Morris and his colleagues also shows clearly that in Southern and Mediterranean Europe there is a much richer repertoire of such gestures than in the North. Cultures differ, it would seem, not only in the extent to which

they employ gestures, but also in the sort of information they rely upon gestures to provide. Detailed comparative field studies on gestural usages are badly needed here, if this point is to be pursued. To the best of my knowledge, none have been undertaken.

There are many issues of great interest concerning the phenomena of autonomous or emblematic gesture which I also have no time to discuss. What can be said about the messages such autonomous gestures are employed to convey? An informal analysis of some of the available published lists from several different cultures suggest that the range of communicative functions for such gestures is relatively restricted.²⁶ Once again, however, we have no data which would allow us to say anything about the circumstances of their use. Of great interest would be case studies of the origins of such gestures, for it seems to me to be a matter of some interest to inquire as to how such gestures become established. What are the processes of formalization that they undergo?

Comparisons between autonomous gestural forms between one culture and another also need to be undertaken. Although a number of lists exist -- lists from France and Italy, from Colombia in South America, from Kenya, Arabic culture, Iran and India, no one has attempted a systematic comparison.²⁷ Such a comparison might be quite revealing, for it would throw light on the question of the 'universality' of such gestures. Ekman has proposed, for example, that gestures that refer to bodily activities -- eating, sleeping, and the like -- are more likely to be similar to one another worldwide than are gestures that refer to other things. This is because gestures that refer to bodily activities are derived from enactments of those activities, and there is much less possibility for variation in how such enactments might be formalized than there is, for instance, for the enactments of manipulatory patterns associated with objects.

As I said at the outset, I believe that we are on the threshold of a new era in the study of gesture. I believe that the study of it will have important consequences for our understanding of representational processes, of the nature of language, and for the ways in which different expressive modalities are exploited in the organization of communication in interaction. It has been my purpose this evening to review some of the recent work that bears on these issues. The philosophers of 18th Century Paris were not mistaken in their appreciation of the significance of gesture. Gesture, it seems, is of great interest precisely because we can see, on the one hand, how it is a manifestation of a spontaneous mode of representation of meaning but how, on the other, such manifestations can become

standardized and transformed into arbitrary symbolic forms. The study of gesture allows us to look both ways, so to speak. It allows us to look inward toward the processes of mental representation, on the one hand, and outward to the social processes by which communicative codes become established on the other. Gesture stands at the point at which individual efforts at meaning representation fuse with the processes of codification. As such, it is invaluable for the study of the central communicative processes of the human species.

Adam Kendon

NOTES

1. Kendon (1982) expands the argument of these paragraphs. Bulwer (1644/1974) is the first book in English to be devoted to gesture exclusively. Angenot (1973) discusses a number of French works of the same period. Condillac's discussion of gesture is in his Essay on the Origin of Human Knowledge (Condillac, 1754/1971). Diderot discusses gesture in his Lettres sur les Sourdes et Muets (Condillac, 1741/1916). Gesture and sign language is dealt with at length in Tylor (1878) and Wundt (1900/1973). For an account of the decline of interest in the question of language origins, see Stam (1976) for a discussion of recent revival of interest in it, see Hockett (1978). Hewes' discussions include Hewes (1973, 1976). For the teaching of sign language to apes see Hill (1978) for a recent review. Sebeok and Umiker-Sebeok (1980) is a useful anthology.
2. For a discussion of the role of spacing and orientation in interaction, see Kendon (1973, 1977).
3. The examples discussed here are reported in Morris, et al. (1979).
4. Partially reported in Kendon (1978).
5. These points are treated at greater length in Kendon (In Press). Compare also Goffman's (1963) distinction between 'given' information and information 'given off'.
6. Compare discussion in Washabaugh (1981). He there proposes

distinction between "presence manipulating" and "meaning-exchanging" communication processes. He suggests: "... the multichanneled visual communications, such as those used by many deaf persons, are of a sort which tips the balance more toward presence-manipulating processes and away from meaning-exchanging processes" (p. 248). Here we suggest that it is in part because, in the medium of 'gesture' it is possible to blur the boundary between intendedly communicative action and unintendedly communicative action.

7. See Meyer (1976) for discussion of the different neurological foundations for emotional expression and voluntary action. Kimura's (1976) studies suggest the intimacy of the relationship between the control of speech and the control of gesture.
8. See, for example, Goodglass and Kaplan (1963), Duffy, Duffy and Pearson (1975), Pickett (1974), Duffy and Duffy (1981), Gainotti and Lemmo (1976). Peterson and Kirshner (1981 is a recent review.
9. See Duffy and Buck (1979), Katz, LaPointe and Marks (1978) and Foldi, Cicone and Gardner (1982).
10. Classifications have been offered by Wundt (1900/1973), Efron (1941/1972), Barakat (1969), Freedman (1972), Ekman (1977), McNeill and Levy (1982), Weiner, et al. (1972).
11. The phenomena of sign languages are beyond the boundaries of gesture although no sharp distinction can be drawn. Once gesture becomes completely autonomous as an instrument of communication, because it must now depend upon itself for its own discourse contexts, it undergoes processes of change which lead it to becoming organized along language-like lines. Autonomous gestures, for example, are equivalent in function to complete utterances and are not to be equated with 'signs' in a sign language, even though, in some cases, a sign language may have taken over forms that are used in the non-sign language using community as autonomous gestures. Washabaugh (personal communication) reports this for the sign language used by the deaf of Providence Island. What is notable is that in such a case, when adopted into a sign language, autonomous gestures become 'lexicalized' in their function and are no longer used as complete acts of utterance on their own. For recent work on sign language see Klima and Bellugi (1979), Wilbur (1979), Stokoe (1980), Land and Grosjean (1980). For accounts of Providence Island sign language see Washabaugh (1980a, 1980b) and Washabaugh, Woodward and DeSantis (1978).

12. Kaulfers (1981); Bates (1979).
13. Head and face gesturing has received very little systemic attention. Birdwhistell (1970) reports on some different kinds of head nods and their functions. Work in the experimental tradition on head nods is reviewed in Rosenfeld (1978). For facial gestures, see discussion in Ekman (1979). Sherzer (1973) and Smith, et al. (1974) provide analyses of lip pointing and tongue showing, respectively.
14. See Kendon (1972, 1975, 1980).
15. McNeill (1979 and McNeill and Levy (1982).
16. See Bates (1979, p. 112) and Wilkinson and Rembold (1981, p. 184). See also Lock (1978, 1980), Clark (1978), Bullowa (1979) and, for example, Bruner (1978).
17. See Freedman (1977), McNeill (In Press), Jancovic, et al. (1975) and Evans and Rubin (1979).
18. Cicone, et al. (1979), Delis, et al. (1979).
19. Skelly (1979 and Peterson and Kirshner (1981).
20. See Slama-Cazacu (1975), Birdwhistell (1970) and Sherzer (1972).
21. Studies which bear on the question of how speakers use gesture communicatively include Cohen and Harrison (1973), Cohen (1977) and Graham and Heywood (1976). Studies of the significance of gesture for recipients include Berger and Popolka (1971), Graham and Argyle (1975), Walker and Nazmi (1979), Riseborough (1981), Sherzer (1973, 1982), Birdwhistell (1970) and Slama-Cazacu (1976). These studies are reviewed in Kendon (In Press).
22. Teodorrrson (1978).
23. For the history of the development of American Sign Language and the conditions which have promoted its growth, see Woodward (1978) and Lane (1980).
24. I refer here to discussions by Pylyshyn (1973), Shepard (1978a, 1978b) and Anderson (1978).
25. See Graham and Argyle (1975) and Walker and Nazmi (1979).
26. See Kendon (1981).

27. Gesture lists for France, Italy, Colombia, Kenya, North African Arabic, and Iran are given in Wylie (1977), Munari (1963), Efron (1941/1972), Szitz and Cervenko (1972), Creider (1977), Barakat (1973) and Sparhawk (1978), respectively.

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