Introduction

I.1 Historical background

The relationships between gestures and speech have been discussed throughout the history of thought. The first writings in the field concerned the gestures of professional speakers: orators and actors. Ancient treatises of rhetoric, such as Cicero’s *De Oratore* and Quintilian’s *Institutio Oratoria* in the first century A.D., gave advice that is still used in the training of public speakers. Besides practical aspects, these texts presented theoretical perspectives and raised questions from which the discussion in contemporary psychology derives. For Quintilian and others after him, the language of the hands seemed to be universal, an idea that was very popular in the 17th and 18th centuries (for reviews, see Hewes, 1976; Kendon, 1982b; Knowlson, 1965).

Thus, the use of gestures was thought to represent a former, “natural” state of language. Such a hypothesis stresses the similarities between gestures and speech: “For other portions of the body merely help the speaker, whereas the hands may almost be said to speak. Do we not use them to demand, promise, summon, dismiss, threaten, supplicate, express aversion or fear, question or deny?” (Quintilian 11.3.85–86). Nevertheless, gestures would constitute a primitive way of communication shared by human beings and animals. The power of gestures in the expression of feelings gives them the quality of a language, yet the language of emotions is not that of understanding. Human specificity must be sought elsewhere than in cries and body movements. “Infants mumble the noise of their emotions, as animals do, but is not the language they learn from humans quite another language?” (Herder, 1772, p. 61 – our translation).

This property of gestures – their being a language but a primitive or even an “animal language” – is emphasized in Diderot’s “Lettre sur les sourds et muets, à l’usage de ceux qui entendent et qui parlent.” Diderot
2 Gestures and speech

congeived an experiment with a “conventional” mute who, without using speech, would try to make himself understood by means of gestures. To order a drink, for example, it would first be necessary to draw the waiter’s attention before any other movement. From the succession of gestures, it would be possible to infer “what the succession of ideas is that would have seemed to the first men to be the best one to communicate their thoughts” (1751/1821, p.13 – our translation). However, gestures and speech cannot wholly substitute for each other, because each sense modality has specific characteristics. “There are gestures so sublime that the noblest eloquence could never translate them,” Diderot wrote (1751/1821, p. 19).

Psychology has inherited these issues. In some respects, gestures are considered to have the property of expressing the content of consciousness as words do (Wundt, 1900/1973). This means, in contemporary terms, that gestures and words both relate to the mental representations that constitute thinking (Kendon, 1986; McNeill, 1985). Thus, a language of gestures exists that exhibits variations from one culture to another, that follows rules, and that allows, like writing, the substitution of visible signs for symbolic meanings. From this point of view, human communication consists, in equal proportions, of verbal and nonverbal behavior, an idea well illustrated in the “kinesics” of Birdwhistell (1970). But gestures are also considered specific and mainly devoted to the expression of emotions. This gestural mode of expression in human beings resembles animal communication, and its study suggests hypotheses about the phylogeny of human behavior. Darwin wrote: “The habitual use of articulate language is, however, peculiar to man; but he uses, in common with lower animals, inarticulate cries to express his meaning, aided by gestures and the movements of the muscles of the face. This especially holds good with the more simple and vivid feelings, which are but little connected with our higher intelligence” (1881, p. 85). Similarly, Wundt held that “the primary cause of natural gestures does not lie in the motivation to communicate a concept, but rather in the expression of an emotion. Gestures are first and foremost affective expressions. . . . Only secondary, insofar as every affect contains strong emotional concepts, does the gesture become a conceptual expression” (1900/1973, p. 146).

I.2 Overview

The relationships between gestures and speech may be viewed from different perspectives. First, commonalities may be stressed. To some
Introduction

extent, gestures identify with speech and can be studied as a “body language” (chap. 1). Other similarities are demonstrated by the analysis of vocal and gestural communication from a comparative and evolutionary point of view. Whether signals are displayed by an animal or by a human being, ethology will raise the same questions: What releases them? What are their functions? What is their ontogeny and their phylogeny (chap. 2)? Second, a system of nonverbal communication may be assumed, distinct from language and specialized in the expression of affective states and interpersonal attitudes (chap. 3). From such a perspective, gestures separate from speech. However, social interactions usually involve a conjunction of verbal and nonverbal aspects. Apart from particular situations like telephone calls, speech does not occur in isolation, and similarly, excepting deaf-mutes, dancers, mimes, and some neuropsychiatric patients, people usually do not gesture without some speech processing. Strangely enough, language has most often been studied independently from its nonverbal context, and gestural behavior has been studied independently from language use (Kendon, 1981).

In the following chapters, we will attempt to specify the nature of the interactions between gestures and speech. Two related perspectives on these interactions are difficult to distinguish on the basis of empirical evidence. One is to assume a central stage shared by gestures and speech and modality-specific stages in input and output processing. The other is to assume multiple connections between a diversity of specialized processing units. With respect to these discussions, three kinds of data will be reviewed: the analysis of the relationships between gestures and speech in cognitive psychology (chap. 4), the study of the development of these associations (chap. 5), and neuropsychological observations bearing on lateral differences in gesture production by normal subjects and on the gestural behavior of different pathological populations, especially aphasics (chap. 6).

I.3 Definition problems

To some extent, any movement or change in position of a body segment may be considered a gesture. Accordingly, the very notion of gesture refers to a great variety of phenomena. In an extended sense, the term encompasses technical gestures that are used in various professions and that often involve tool use. From such a perspective, gestures are mainly actions before becoming means of communication. They are also visually guided to reach a goal in the physical environment (for a motor-control
4  Gestures and speech

perspective, see, e.g., Keele, 1981; Schmidt, 1988). The attempt here is
not to analyze the diverse relationships between language and action
nor to examine the multiplicity of anthropological studies proceeding
from Mauss’s (1935) suggestion concerning “techniques of the body”
(see, e.g., Mathon, 1969; Meyerson, 1986; and the journal Geste et Image).

Many disciplines use the notion of body language with a wider exten-
sion than that given here. For example, social sciences describe bodily
expression as an image of the society (e.g., Douglas, 1973). In psychol-
ogy, correspondences between physical and psychological characteris-
tics are sought, or beliefs that such correspondences exist are described
as social stereotypes (see, e.g., Asendorpf & Wallbott, 1982; Chaiken,
1986; Jodelet, 1984; Wallbott, 1982). In a different perspective, bodily
techniques aiming at nonverbal expression are proposed (Ancelin-
Schützenberger & Geffroy, 1979). These investigations of bodily symbols
have valuable objectives, but they shed little light on the relationship
between gestures and speech. Indeed, it is significant that these endeav-
ors are more concerned with the body than with the gestures as such.
Describing body language in such a way does not explain why a particu-
lar movement is produced at a given moment. Moreover, from a method-
ological point of view, it may be noted that access to the meaning of
bodily movements is given by verbal mediations: the inquiries and the
reports of informants in social sciences, the patient’s free associations
and the therapist’s interpretation in psychoanalysis, and questionnaires
in psychology. In some cases, even the direct observation of movements
is dispensed with. One study, for example, examined the meaning of
self-touching behavior by correlating the results of several question-
naires, some bearing on diverse aspects of temperament and one on the
description by the subject of his or her own fidgeting habits (Mehrabian
& Friedman, 1986).

The purpose of the present book is different. Research on actual move-
ments, observed or recorded in situations of verbal intercourse, will be
surveyed. What movements will be examined? Gestures may be defined
in a narrow sense in which only symbolic hand movements used for
communication are considered. This is the case with daily-life gestures
produced in order to insult, reprimand, command, etc. Such a restricted
definition neglects nonrepresentational movements and unintentional
gestures, like those of a speaker on the telephone to which the correspon-
dent has no access. According to a wider definition, gestures are any
kind of movement performed during speaking, not only hand move-
ments but also head, eye, and face movements. Indeed, movements of
various parts of the body may express skepticism, approval, interest,
Introduction

etc. (They may also be disregarded by the listener.) Moreover, many gestures combine movements of several body parts, like pointing in one direction with the index finger and looking elsewhere or shaking one’s fist while frowning.

It seemed useful for the present purpose to find a compromise between a narrow definition of the domain restricted to representational and symbolic gestures and a broad definition encompassing any movement that relates by necessity or contingency to verbal interchanges. Indeed, the literature devoted to the communicative value of bodily movements is now extensive. Furthermore, the study of some problems results in the formation of specialized domains that focus on questions other than the relationship of gestures to speech. This is the case for most of the research on the facial expression of emotion and for a good deal of the studies on the social functions of gaze (see, e.g., Ekman, 1982; Feyereisen & de Lannoy, 1985; Kleinke, 1986; Oster, Daily, & Goldenthal, 1989; Rutter, 1984). An exhaustive review of the literature was not attempted; rather, our concern is centered on specific questions: Why do people move while speaking? What role does this activity play in verbal exchanges? What kind of relationship does it exhibit between the verbal and the nonverbal domains?
1. Body language

For a long time, gestures were studied under the assumption that human beings communicate not only with words but also with body movements. Several observations, indeed, support the hypothesis that the processes underlying verbal and nonverbal behavior may be analogous. First, gestures, like spoken languages, vary according to place, time, and socioeconomic factors. Second, body movements, like speech sounds, convey symbolic meanings, and some conventional gestures belong to a given language as truly as do lexical items. Third, regularities in gestural performances while speaking resemble syntactic rules. Thus, it may be that linguistic methods can be used in the study of gestures.

1.1. The cross-cultural study of gestures

As one learns the language or the dialect of the group one belongs to, one reproduces the gestures, the facial movements, and the bodily expression typical of this group. Mauss (1935) defined the “techniques of the body” as the ways by which people, in their own society, know by tradition how to use their bodies. Resting postures like sitting, lying, crouching, etc., illustrate this notion. Hewes (1957) described the world distribution of more than a hundred variants. These postures also receive different connotations according to the culture: the “open” posture of a woman (elbows far away from the body, legs stretched out, knees apart, etc., versus the “closed” posture: elbows next to the body, arms crossed, knees pressed together, etc.) is judged positively in the United States but considered immoral in Japan. More generally, the connotative meaning of postures and gestures verbally described to subjects and rated on several bipolar scales is influenced by different considerations in different cultures: for example, mainly by status in Japan and by the evaluation as pleasant or unpleasant in the United States (Kudoh &
Body language

Matsumoto, 1985; Matsumoto & Kudoh, 1987; McGinley, Blau, & Takai, 1984).

The best known example of cultural differences in the use of gestures is the case of head movements expressing affirmation and negation. According to Jakobson (1972), three patterns may be distinguished in Europe: (1) vertical nod for “yes” and horizontal shake for “no,” (2) horizontal shake for “yes” and throwing the head back for “no,” and (3) forward head bending for “yes” versus backward movement for “no.” The hypothesis was proposed that when negativity is expressed by horizontal shaking, the movement begins to the right or to the left according to the ocular dominance of the subject. This hypothesis was not supported, and when requested to answer several yes–no questions, the subjects showed little consistency in the direction of the first move (Collett & Chilton, 1981). There are other examples of similar gestures expressing different meanings. For instance, tongue showing may be used to tease in Europe or to greet in Tibet; forming an O-shape with the thumb and the index finger may signify “OK,” money, zero, or an insult; hand raising with fingers making a V is an obscene gesture for the British when the palm faces the performer but means “victory” when the palm faces the audience, whereas for continental Europeans, the two versions of the gesture have the same victory meaning (Calbris, 1981; Kirch, 1987; Kirk & Burton, 1976; Morris, Collett, Marsch, & O’Shaughnessy, 1979; Morsbach, 1973; Scott & Charteris, 1986).

Communication between people from different cultural backgrounds may thus suffer from comprehension problems. By way of illustration, there was a Soviet leader who, after a conference in the United States, expressed the friendship between the two nations by joining his hands over his head, a gesture by which American athletes indicate triumph. The observation of similar misunderstandings has led teachers of foreign languages to propose the inclusion of the study of gestures in the acquisition of a second language. Many emblems, indeed, are equivocal if their meaning has not been learned (Calbris & Montredon, 1986; Erikson, 1979; Safadi & Valentine, 1990; Saitz & Cervenka, 1973).

It is also well known that gestures accompanying speech are more frequent in some cultures than in others and that they may take different forms for different ethnic groups. One of the first and most systematic analyses of cultural differences in gestural behavior was conducted in New York by Efron (1941/1972). Gestures performed while speaking by Jewish immigrants from Eastern Europe were compared with those performed by immigrants from Italy. Some differences appeared in spatial
8  *Gestures and speech*

and temporal characteristics, that is, the planes and axes used, the gesture shapes, the tempo, and the body segments involved. The gestures of the Jewish immigrants were narrower and shorter in duration, their rhythm was more irregular, and their shape more complex, with frequent changes of direction, than those of the Italian speakers. The Jews executed the movements in the frontal and vertical planes and used mostly their hands and forearms unilaterally; the broader gestures of the Italians also occupied the lateral plane and involved the use of both arms simultaneously. Other differences concerned the social and ecological aspects of gestures. The Jewish immigrants often spoke close to or while touching their partner whereas the Italians maintained greater interindividual distances. Gestures with held objects or simultaneous gestures by the listener were observed only among the Jewish people. On the semantic level, the gestures performed by the Jews described the thought pathways or showed the different steps of an argument; the Italian gestures conveyed symbolic or illustrative meanings and referred to concrete aspects rather than to abstract processes. After Efron described these differences among the immigrants of the first generation, he observed the second-generation immigrants. These people of Jewish or Italian origins were considered assimilated. The ethnic characteristics of the gestures faded. Furthermore, some “hybridization” had occurred; some typical items of Anglo-Saxon behavior appeared with traditional items, so a genetic interpretation of the original differences was ruled out. A more recent comparison of American Jews and Anglo-Saxon American Protestants, both groups observed while leaving a religious service, confirmed Efron’s results. Similar investigations might be conducted to analyze other cultural differences between or within societies (Argentin, 1985; Ricci-Bitti, 1976; Sainsbury & Wood, 1977; Shutter, 1979).

It should be stressed that even when some movements seem to bear a universal meaning, as is the case with some facial expressions and gestures of emotion used in social encounters, culture may exert an influence by prescribing or repressing their public manifestation. Consequently, people from different ethnic backgrounds may vary in their ability to understand nonverbal signals. For instance, the gesture of touching the arm or the shoulder of others to express sympathy or reassurance is not allowed in the same circumstances in all societies. The culture may also confer a particular meaning to a particular movement. For example, a rapid eyebrow raising in a social context, or eye flash, universally indicates a readiness to interact, but depending on the culture, a particular connotation of friendship or hostility is added (Eibl-
Body language


While obvious for the observer, cross-cultural differences in gestural behavior remain difficult to explain. On the one hand, they may be compared with regional accents that simply result from traditional transmission of “habits” and serve no other function than to reveal the social or geographical origins of individuals. On the other hand, it may be that differences in gestures relate more deeply to the systems of symbols and values of the groups being compared and thus to cross-cultural differences in other domains.

1.2. The semiotic meaning of gestures

Movements as symbols

The meaning of some gestures originates in their symbolism, as shown by many insulting gestures or by a gesture like covering the mouth while yawning, now a sign of civility but formerly a protection against malign forces. These gestures derive from beliefs in the evil eye or in demonic influences within magic practice (Röhrich, 1960). Beyond these vestiges of almost past times, some movements reflect social divisions according to gender, age, status, or kinship and are explained by the members of a society by reference to a symbolic system. For instance, gestures and postures expressing hierarchical relationships may be linked to the proper way of representing the world. In his study of the Tikopia of the Pacific, Firth (1970) was told that the natural orientation of the body divides space into an anterior and a posterior region. The center of interest – the leader or the guest – is faced, and subordinates are shown the back. Proximity implies similarity of status. This structure of attention may be compared to the results of investigations made in a different context in primate ethology (see chap. 2). In human societies, however, bodily signals are explicitly conceived in relation to general views, including the understanding of the natural or built environment within social categories (see Schmitt, 1990, for other examples; see also Hinde, 1976, for further discussions).

This way of conceiving the relationships between body language and symbolic systems has the advantage of showing that terms opposed in often sterile controversies are not true dichotomies: Here, nature is cap-
tured in the terms of culture. The critical issue is not to demonstrate the biological foundations of behavior – for instance, to relate gender differences to anatomical and hormonal factors or to relate handedness to cerebral asymmetry. It seems more important to see that social representations invest natural reality and that people behave according to these second-order phenomena. Thus, societies, by formulating sex roles, may modify the influence of biological differences. Similarly, if the use of the right hand is mandatory in judicial or religious rituals, it is more because of its symbolic meaning than because of its motor ability (Hertz, 1909).

In the different examples presented above, a capacity was assumed for members of a society to “explain” or to justify in some way the reason for the symbolic gestures that relate to beliefs and values. However, this is not necessarily the case with the entire set of gestures performed by a group. Most often, the origin of a tradition is lost. It just seems “natural” to express disdain by shrugging or by spitting and to greet by hat tipping or by handshaking. The informant is rarely able to comment on these habits, and their symbolic meaning cannot be discovered.

Sign arbitrariness: conventional and iconic gestures

Some gestures, like words, signify by a convention established within a community. A group of adolescents, for example, may create a secret gestural code meaningful only to themselves. These gestures do not need to be justified by reference to a symbolic system. Linguistic signs are characterized by an arbitrary relationship between the material (visual or auditory) form of the sign and its referent. From this point of view, iconic and deictic gestures that relate to the referent by similarity or spatial contiguity differ from true linguistic signs. Actually, conventional and iconic gestures cannot be distinguished as sharply as it may seem.

Gestures may be shaped to resemble what they refer to, like onomatopoeia, although they are arbitrary to the extent that different cultures choose different ways to establish similitude. For instance, a counting gesture may begin with the thumb or the little finger, drinking may be expressed by pretending to hold a glass or by describing the flow of the liquid with an extended thumb, etc. (Calbris, 1987).

The issue of sign arbitrariness has elicited investigations on the “transparency” of gestures used in sign languages like the American Sign Language (ASL) and the manual communication system of the North American Indians (Amer-Ind). In these languages, many iconic or deictic gestures exhibit relationships of similarity or contiguity between the sign and the referent. Sign languages might thus be considered more re-