

DEVELOPMENTAL KINESICS

The Emerging Paradigm

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Foreword

Research in linguistics has traditionally concerned only the verbal code itself. Structural linguistics and transformational grammar have both analyzed the human code of communication as a formal structure—that abstract system that sets humans apart from animals (see French, 1976, for a review). The nonverbal communication behaviors that animals and humans have in common were considered part of behavior, but not part of language. In the Platonic dualism of psyche and soma, the domain of the language researcher was clearly the mind and not the body. This end of the dualistic split was not peculiar to linguistics, however, but followed a trend that has continued for several centuries. In fact, a survey describes 2,000 years of Western European culture as based on the notion that “man is essentially a soul for mysterious and accidental reasons imprisoned in a body” (Brown, 1959).

The present interest in nonverbal communication as an integral component of language performance represents a basic and important shift in the language researcher’s view of the phenomenon he or she studies. This trend toward the integration of psyche and soma, mind and body, formal code and actual performance is, finally, a more complete view of language. This is the view that has always been maintained by von Raffler-Engel, to whom this volume is dedicated. In this view, the focus is upon the complementary relationship between the verbal and nonverbal components of the linguistic code.

Like most shifts in science, this move to a more complete view of language is neither spontaneous nor anomalous. It is motivated by evidence that the goals of traditional language science are unattainable without consideration of the (nontraditional) nonverbal aspects of the phenomenon as well. This research suggests that nonverbal aspects of language are not just an “animal accompaniment” to the human verbal performance, but rather a necessary part of the signal for the human (animal) processor. For example, it has long been appreciated that variety of vocal phenomena such as acoustic markers of intonation, pause, and accent are necessary to the perception of syntactic structure (Trager and Smith, 1957; Chomsky and Halle, 1968). What is important here is the discovery that these markers are often perceived from the body movements of the speaker. Even trained linguists transcribing speech from videotapes wrote pauses and accents

that were not in the verbal-acoustic channel at all. McQuown (1964) stressed the importance of body movement to the traditionally motivated linguist because "it will make them conscious, some of them for the first time, that they are picking up their stresses and their pitches not via the ears, although they fancy they are, but by the eyes (p. 124).

The first system for transcription of nonverbal information was devised by the American anthropologist, Ray Birdwhistell (1952). He coined the term *kinesics* for the study of body movements and derived much of its technical terminology from the field of linguistics. For example, analogous to the phone, phoneme, allophone, morph, and morpheme in linguistics are the *kine* (the basic unit of body motion), *kineme* (the smallest discriminable set of body movements), *allokine* (variant of the *kine* which, in combination with other allokines, constitutes the kineme), *kinemorph* (combinations of kinemes), and *kinemorpheme* (combinations of kinemorphs functioning as free or bound classes) or kinesics. The analysis of kinic movements also includes their co-occurrence with particular syntactic environments of speech. In American English, for example, distal extension of the head or hand is associated with pronominal forms such as *he*, *she*, and *it*, while proximal movements occur in association with the forms *I*, *me*, and *us*. Such motions are not instinctive, but learned systems of behavior, which differ from culture to culture (Birdwhistell, 1966).

Lomax (1968) developed a rather elaborate system of measurement known as Cantometrics. Cantometrics, originally a system for the description of song style, can also be applied to the analysis of styles of speaking. The parameters of the system include features of song performance such as embellishment, vocal noise, dynamics, and repetition. Following Trager's (1958) system of paralinguistic notation and Chapple and Arensberg's (1940) interaction theory, Lomax (1977) devised a rating system that correlates measurements of speech style with other culturally determined characteristics. For instance, Lomax related variation in the informational load of the verbal channel to measures of socioeconomic complexity, high verbal density, for example, being a factor typically associated with relatively complex social organizations and systems of production. Thus, it is suggested that particular features of speech style are not only learned, but correlated with specific sociocultural configurations.

A second type of nonverbal analysis falls under the rubric of *interactional synchrony*, or the description of rhythmically coordinated movements between speakers and hearers. This phenomenon was first observed by Condon and Ogston (1966) after viewing sound films of normal, aphasic, and schizophrenic interactants. An analysis of the films (taken at twice normal speed) revealed synchrony in the speech and movements of normal interactants, but not for autistic and schizophrenic patients. In addition, pathological interactants displayed a certain "tenseness" of posture and

lack of variability in head movements and eye gaze, and the speech of depressed patients was characterized by a smaller degree of variation in pitch, stress, and length than typically observed in the vocalizations of normal interactants. Scheflen (1963), who has used sound film to study the behavior of interactants during psychotherapy, observed a complex of nonverbal regulatory devices that seem necessary for maintaining the stability of social interaction norms.

Further investigation of interactional synchrony was conducted by Kendon (1970), who focused upon the context of interaction. Following the segmentation method developed by Condon and Ogston, Kendon found that participants not directly addressed by the speaker displayed movements of different form and timing than actively engaged participants. Mirroring of the speaker's movements by the listener, for example, was only observed between speakers and actively involved listeners. One explanation for speaker/listener synchrony provided by Kendon is compatible with an analysis-by-synthesis model of speech perception. That is, by actively monitoring the speaker's movements, the listener is constructing a running hypothesis of the speaker's actions that can be checked against future actions and used as a means by which to decode future output.

From the viewpoint of information theory, or the mathematical theory of communication (Shannon and Weaver, 1949), the management of sequencing information in a separate channel increases the information load that can be carried by the verbal channel. Thus, the total channel capacity of the human communicator is greater than if such sequencing were handled in the verbal channel alone. The additional load carried by the verbal channel would make the information less discriminable if transmitted at the same rate. There is a neurological advantage to the nonverbal channel as well. Kimura's (1973) research suggests that kinesic movements are controlled by the hemisphere opposite that of language. Kinesic behaviors are in a different modality (visual) and so require the use of different "work space" in the brain. Thus, a person who is left-hemisphere dominant for speech has the kinesic aspects of the code controlled by the right hemisphere. (This opposite mapping is typical of neurological control or concomitant activities.) Thus, from the point of view of information theory, the usefulness of a separate channel for segmenting information finds empirical reality in the neurology of the speaker/hearer. The empirical reason that kinesic information allows for greater total information capacity is that nonverbal information is decoded by different equipment at the destination. Thus, neurological evidence also illuminates the integral nature of kinesic behavior to ongoing verbal behavior. Control of body movements unrelated to speech (such as adjusting one's dress or hair or rubbing the nose) reveals no reliable hemispheric assignment. Only kinesic behaviors

were lateralized, mirroring in neurology what has long been observed in performance and decoding—that kinesics seems to be an integral part of both the code of language and its performance.

Similarly, the process of language acquisition reveals kinesics to be both a part of the code that is acquired and an important aspect of the acquisition process. In the early 1960s, when developmental psycholinguistics was emerging as one of the most exciting areas of language study, the focus of this field was transformational. Chomsky's Formal Theory of Syntax was exclusively a property of mind or psyche and dealt only with an abstract system. It is now clear that the complete study of language development must take into account all aspects of the interactional context, including maturational, biological, and cultural factors, as well as verbal and kinesic aspects of the linguistic code. Originally controversial, these points have since become common knowledge in language science. (See French, 1976, for a history of this evolution.)

Cross-cultural differences in kinesic code is one of the older areas of nonverbal communication, tracing back at least to Darwin (1872). He considered the evolution of nonverbal communication of wolves in the same manner as the evolution of other traits, and also collected data on cross-cultural expression of emotion (Darwin, 1872). Efron (1941), who provides one of the earlier modern comparisons of gesture, found that individuals learning a new language in a foreign community assimilate their gestural patterns to those of the target language group, and Hewes (1955), in a study of posture, found patterns of standing and sitting to differ from culture to culture. The general dependence of kinesics upon culture, both in the cultural diversity of kinemes and the sociocultural parameters regulating their use, suggests that kinesics is not as instinctive a system as once imagined. Clearly, although some aspects of facial expression may be genetic (Darwin, 1872; Izard, 1971), the cultural conditioning of kinesic behavior suggests that it is, in general, learned.

In kinesics, the Platonic dualism of soma and psyche, mind and body are becoming integrated. An empirical approach to language finds both psyche and soma—the code of language and the communicative behaviors of the living organism who uses it. Earlier paradigms viewed only one and, thus, were not really paradigms of language, only of a part of language. Transformational grammar was a theory of syntax. Chomsky (1965) stated clearly that his theory made no statement whatever about how a speaker/hearer would go about creating a sentence. At the other extreme, behaviorism considered only observable behavior—soma—and strictly discounted the existence of mind or psyche.

In other respects, kinesics is similar to any other new science. It has its founding fathers (e.g., Darwin), its popularizers (see the best seller list), its own innovators, eccentrics and outright nuts (make your own list), as well

as a host of serious and productive theoreticians (e.g., Birdwhistell) and researchers (e.g., von Raffler-Engel). This cast of characters is typical of a new field. What is most promising and unusual about kinesics and nonverbal communication in general is its integration of psyche and soma, formal code, and empirical behavior. Although with only the beginning of a ruling paradigm, this integrative approach holds the promise unsuggested by either transformational theory or behaviorism—that of uniting both formal and empirical aspects of language in what has the potential to be a thorough-going theory of human communication—a complete picture of what the human animal is doing when he speaks his mind. It is this promise that makes the integrative approach to research a contribution beyond kinesics itself, and ultimately to the science of language as a whole.

Patrice French
Marcie Dorfman

Preface

Kinesics is that part of nonverbal behavior that is interrelated with language. It is, then, an integral part of human communication and as such has received critical attention over the past few decades. The broader, if overlapping, fields of nonverbal behavior and nonverbal communication have not only received wide scholarly attention but in the guise of body language have received much popular attention in books, magazines, Sunday supplements and the like. The more restricted field of kinesics is not yet so well circulated in the popular eye but is developing an imposing bibliography. Kinesic systems of various languages and clashes of kinesic systems across cultures are being described. The subarea of kinesics that has received perhaps the least attention to date is developmental kinesics, the study of the acquisition, development, and maturation of the kinesic system. This volume is a first step in the direction of this area of nonverbal studies.

The 70s saw a rapidly growing interest by ethologists, anthropologists, and comparative psychologists in the general field of nonverbal behavior, as in Hinde (1972). Weitz's (1974) collection on nonverbal communication highlighted, among other things, the especial interest of clinical psychologists and psychiatrists. Some linguists and other language specialists began turning their attention to the broader context of language as part of communication somewhat earlier, but recently their interest has intensified, as in von Raffler-Engel and Hoffer (1977) and the 1980 volumes by von Raffler-Engel and by Key. Currently many disciplines are studying the child's development of nonverbal behavior, and their possible convergence on a developmental pattern is an interesting prospect. As emphasized throughout this volume, it is the emergence of a paradigm from the independent work in different fields that has led us to prepare this volume on developmental kinesics.

Much of the study of kinesic development has paralleled the study of language development. The long history of language acquisition research and its current sophistication provide a natural model, especially because kinesics is intimately intertwined with language. Childhood acquisition patterns provide insights into the adult system and insight into the model we use to describe that system. Given the high level of language acquisition research, it is unfortunate that so many of the observations on kinesic development have been made as footnotes to language acquisition. The full

system of kinesic patterning has needed a paradigm as the frame of reference within which the atomistic observations can be placed and interrelated. Attention to the bibliography will show the large amount of information—usually unconnected and from different fields using different premises and methodologies—we already have on the subject. It is the purpose of this volume to establish a frame of reference for developmental kinesics.

The organization of the volume begins with an overview and outline history of the field. The first section, "Toward an Integrated Model of Developmental Kinesics," contains three articles that chart a pattern for the acquisition and development of kinesics from neonate through adult system, especially as it parallels language development. The second section discusses the naturalness principle, one of the components of which is a search for the distinction between human universal features and cultural/conventional/learned features of human behavior and development. The core of the section is a search for universals in sign language systems, a search of interest herein because it deals with the development of a nonverbal system with many—some would say "all"—defining characteristics of human language. The third section, "Cognitive Kinesics," shows how the study of kinesics relates to the current interest in the cognitive sciences. The articles treat the development of behavioral perception and production as well as the study of modeling/imitation and teaching/learning in transmitting patterns of behavior and values from generation to generation. The fourth section, "Methodologies," gives examples of kinesics-related research from the different fields of early childhood development, linguistics, and epidemiology. Each section begins with its own introductory comments that provide an overview of the articles included.

Given the centrality of the notion of paradigm for this volume, it is appropriate to consider seriously the concept of a scientific paradigm and to draw on its implications for this volume. In his innovative approach to historiography, Thomas Kuhn (1970) discussed the concept of a scientific paradigm. He reviewed the positivistic tradition in which he was trained as a physicist and contended that, contrary to conventional wisdom, science does not progress by the mere accretion of new knowledge to already existing bodies of information and does not advance by the adding of new theories to old ones. What essentially takes place, he argued, is a spiral progress of growth with distinctive stages of development. The first stage in the cycle of progress he calls "normal science" and characterizes it in highly conservative terms as a protection of the *status quo*. As the findings of scientists in the field accrue, there is a gradual awareness among the scientific community that anomalies exist. This awareness gradually leads to his second stage of scientific progress known as "the period of crisis." During this interim, many competing models emerge and each of these provides an attempt at

resolving those conflicts and anomalies that led to the failure of the traditional model. The focal point of Kuhn's model can be found in the emergence of the third stage of scientific growth. This occurs when one of the competing models is accepted by the community of scholars as the best model or paradigm. At this time in the spiral of growth, a scientific revolution takes place in which researchers find a new way of perceiving knowledge. This new theoretical framework is what Kuhn calls a "paradigm." It is indeed a new way of perceiving science, a recognition of data and theory.

Although this concept of a scientific paradigm is currently established in the literature, it is not adequate for conveying what we mean by paradigm in this volume. When Kuhn used the work, he meant it to apply to the growth of knowledge within an already established field of knowledge, such as physics or biology. In the case of developmental kinesics, however, there is no firmly established tradition from which new paradigms can emerge in the cycle of growth. Instead, the situation is more of a genesis of knowledge rather than a modification of current concepts by revisualizing them in a different framework. For this reason, the concept of a paradigm espoused in this volume is best understood within the framework of interdisciplinary research.

New disciplines have always developed within the natural and social sciences. Consider the case of social psychology. At one time there were sociolinguists who looked at the role of the individual in society and psychologists who attempted to study how society was incorporated within the goals and ideals of the individual. Each of these perspectives was on the fringe of the normal sciences of both psychology and sociology; from their interaction across both models of science there emerged the genesis of a separate autonomous discipline known as social psychology. It is apparent that the study of developmental kinesics is on the verge of a similar pattern of growth. Scholars from different disciplines have been concerned with how symbolic systems are acquired. They are not content merely to investigate psycholinguistic patterns of the emergence of language in children and have complemented their work with the study of nonverbal behavior. This shift in focus has been so promising for some that they have essentially been working fully within the paradigm of developmental kinesics discussed in this volume. Unfortunately, the work of a few isolated but enlightened individuals is not sufficient to comprise a full paradigm. This requires a concerted effort of numerous scholars, all converging on the same insights, theoretical claims, research findings, and methodological practices. The convergence of independent research using different premises and methods is the strongest of arguments for validity. It is with the expressed concern for the legitimization of a new and promising paradigm that this volume is presented. The contributors to this emerging model all share in this quest. We only hope that the reader will also become an active part of this effort.

Each section of the book is preceded by an overview and commentary. The references cited are given in a single Literature Cited section at the end of the volume. Neither the commentary nor the bibliography is designed to exhaust the literature in the field; they cite relevant research that the interested reader may explore at leisure.

Bates L. Hoffer
Robert N. St. Clair

*This book is dedicated to
Walburga von Raffler-Engel,
a pioneer in the field of developmental kinesics*

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