

PRODUCTION, COMPREHENSION AND IMITATION OF
CODIFIED GESTURES IN APHASICS

Hanna K. Ulatowska, Ph.D.
Department of Communication Disorders
The University of Texas at Dallas

Libby Kumin, Ph.D.
Department of Hearing and Speech Science
University of Maryland

Edith Kaplan, Ph.D.
Aphasia Research Center
V. A. Hospital, Boston

Investigators have long been impressed with the frequency with which an aphasic patient who cannot make his needs known verbally will not spontaneously circumvent his difficulty by the use of gesture or pantomime. In 1870 Finkelnburg noted that aphasics had not only lost the ability to understand and use conventional "speech signs" but other conventional signs as well. He introduced the term "asymboly" by which he meant a general disturbance in the ability to use or understand symbols in any modality including mimetic expression. This notion was supported by such eminent neurologists and aphasiologists as Hughlings Jackson (1803), Lord Brain (1961), MacDonald Critchely (1939) and Kurt Goldstein (1948). At the turn of the century Hugo Liepmann (1900) ascribed the inability of aphasic patients to perform gestures to verbal command, to a movement disorder, an ideomotor apraxia, i.e., a dissociation between the idea of the movement and its motor execution. The body of literature on gestures has since viewed gestural impairment either as a central communication disorder on the one hand (a manifestation of aphasia), or on the other hand as an apraxia (a movement disorder) Goodglass and Kaplan, 1962; DeRenzi and Vignolo, 1966.

The present authors have elected to investigate emblems, the one class of gestures defined by Ekman and Friesen (1969, 1972) as nonverbal acts which have a direct translation usually consisting of a word or phrase, because this specific gestural behavior provides an ideal meeting ground for the study of apraxia and aphasia. The use of these gestures combines a learned, highly symbolic component, i.e., the semantic encoding and decoding of emblems, and a kinetic component, i.e., the manner of execution of the movements involved in the gesture.

Developmental studies on the use of such emblems have been conducted by Kumin and Lazar (1974) who found that the ability to encode and decode, significantly increased with age, and analogous to language, decoding was more advanced than encoding. Williams in 1973 found that language delayed children aged 3 to 5 were delayed in this gestural ability as compared to the normal children studied by Kumin and Lazar.

Though various sign language systems proposed for use by aphasics employ emblems (Eagleson, Vaughn and Knudson, 1970; Goldstein, 1952; Skelly, 1972) to date there have been no systematic qualitative investigations of the use of emblems in normal and aphasic adults. The need to establish adult norms, and to investigate the aphasic's ability to perceive gestures, execute them, perceive the meaning of emblems and to translate such meaning into gestures, is long overdue.

We will be reporting here on a pilot study of 40 aphasics and normal controls, men and women ranging in age from 23-75 years of age. All were literate, native American speakers. All were right handed, and the aphasics had each suffered a single CVA resulting in a unilateral left hemisphere lesion. All aphasics were at least three months post onset.

The main objective of this pilot study was to establish a specific methodology, and to formulate a comprehensive qualitative gestural scoring system.

All subjects received a 10 item test for oral and limb apraxia, scored on a 3 point scale according to DeRenzi and Vignolo. The aphasics received the short form of the Schuell test, and a severity rating of a five-minute oral speech sample (conversation and expository speech subtest of the Boston Diagnostic Aphasic examination).

Twenty-five emblems were presented to all subjects in each of three task conditions; encoding, decoding, and imitation. Two examiners were trained to produce the emblems in a specified manner through videotape and written descriptions of the components of the emblems. One examiner tested all subjects in Dallas and a second examiner tested all subjects in Maryland. Written descriptions were compiled by two scorers, one in Texas and one in Maryland. The emblems presented could be divided into seven types--Commands, e.g., get up, sit down; Body States, e.g., I am cold, I am tired; Inquiries, e.g., What time is it; Social Amenities, e.g., hello, goodbye; Responses, e.g., yes, I don't know; Attributives; he is fat, he is tall; and Evaluatives, e.g., it smells bad, it is too loud.

Since there is such a paucity of information available as to the manner in which emblems are perceived or produced, this paper will concentrate on the qualitative information

describing the variations in perception and production, and the category scoring system derived from the analysis of the pilot study data.

Firstly, normals had relatively little difficulty with any of the tasks. They did on occasion omit certain minor portions of the gestural act, such as the accompanying facial expression or a vocalization, e.g., shsh accompanying the gesture be quiet. There were a few instances of hesitation or delay and a few failures. On encoding, e.g., there were two instances of what we call command performance, performing the movement as opposed to gesturing, e.g., actually standing up instead of gesturing. In decoding come here was occasionally substituted for hurry up and hello and goodbye were used interchangeably. In encoding, there appeared to be a greeting wave which was used for both hello and goodbye. Variations in production were noted, e.g., using the index finger or the entire hand for come here, flipping the hand and gesturing toward a chair, or patting the seat for sit down. A lack of smoothness and some slowness was noted for gestures involving repetitive movements, e.g., hurry up and goodbye particularly in the subjects over 65 years of age.

The aphasic subjects had conspicuously more difficulty than the normals in each emblem task. An error analysis of the aphasic responses yielded two basic dimensions: the physical characteristics of the performance and the symbolic content.

The following categories relating to physical characteristics were observed in the execution of gestures on the encoding and imitation tasks.

1. Incomplete

The vocal component of an emblem may be lacking; e.g., I am cold without an audible shiver or be quiet without a "sh" sound. In encoding, this was considered an acceptable variation (based on normals) but on imitation, where the subjects had been instructed to do exactly as the examiner did, such deletions were tallied.

The facial expression accompanying a gesture may be lacking; e.g., it is too loud produced with hands covering ears with no facial expression of discomfort.

The movement may be lacking, e.g., for stop or okay, no forward thrust would be observed.

One or more movements in a series of movements may be missing, as in get out, or hurry up.

2. Distortions

The encoder may produce a correct movement, but spatially distort it in some way. There can be shift of plane, e.g., for get up, hand on level with the eyes, or for he is tall, hand at waist level.

There may be a change of angle, e.g., fingers facing the face for she talks too much.

There may be a change of locus, e.g., hand above the ears instead of on the ears for it is too loud.

There can be a change of hand; i.e., mirror image, e.g., the examiner produces stop or come here, and the subject produces the movement with the opposite hand.

There may be a change of finger, e.g., come here produced with the middle finger or okay with thumb and ring finger.

3. Slow and Uncoordinated

Emblems involved would be those that consist of a group of movements serially performed. For hurry up, get out, or I am hot, the flow of movements may reflect impairment involving a dynamic factor, i.e., the continuity of movements and their kinetic melody.

4. Diffuse or Undifferentiated

Movements that are vague or disorganized were observed in those aphasics exhibiting severe apraxia on pretest--and were not limited to any one emblem. Some aphasics tended to persevere on one diffuse gesture, e.g., one man used a gesture something vaguely like shaving but used it to decode every gesture for a run of as many as 10 consecutive gestures before shifting to another movement.

Turning now to the symbolic aspects of emblems the following descriptive categories reflect the varieties of impairments.

1. Paramemia

The performance of an emblem other than the one required may be semantically related, e.g., sit down for stand up; movement related, e.g., come here for hurry up; locus related, e.g., it is too loud for my head hurts or completely unrelated. It is noteworthy that there were very few unrelated responses.

2. Command Performance

This type of response involved the execution of the physical action or acting out the emblem instead of making the required symbolic gesture. It occurred only for the command and body state emblems, e.g., for get up or sit down, subjects actually got up or sat down. For get out subjects tried to move the wheelchair toward the door, or rise and start to leave.

3. Deictic Behavior

This type of response involved pointing to the part of the body related to the locus of the emblem, e.g., for be quiet, and she talks too much and I don't like it all were responded to be pointing to the lips.

Both command performance and deictic behavior are instances of concrete behavioral responses rather than symbolic responses. They occur frequently in the aphasic population in both encoding and decoding tasks.

The following categories of responses are relevant only to the decoding task:

1. The most conspicuous category manifesting impairment of symbolic behavior is non-representational asymbolic descriptions.

Here the subject describes the symbolic gesture as an action. For example: "she is pointing" for get out; "hold hand out" for sit down; "you are closing your eyes" for it is too loud; "you are sticking out your tongue" for it tastes bad; "that's my nose" for it smells bad.

2. Semantically related emblems

Various types of semantically related responses were noted. These responses may be semantic polarity responses, responses which are the opposites of the gestures presented, e.g., sit down for get up.

They may be overgeneralizations, such as "large" for he is fat, "nasty" for it tastes bad, or overspecifications, "sour" for it tastes bad, "nose bleeds" for it smells bad.

They may also be related by causality, e.g., "he eats too much" for he is fat.

3. Responses related by physical characteristics

In this category responses may be locus related, i.e., the decoder may be responding with a gesture made in the same locus or area but involving different movements and different meanings, e.g., "it tastes bad" for it smells bad, "he is hot" for my head hurts.

Responses may also be movement related. The movement is recognized but the locus is ignored or misinterpreted, e.g., "philosophizing" or "explaining something" for sit down, "get out" or "get away" for I don't like it.

For both decoding and imitation, aphasics often demonstrated inattention to detail or not perceiving all of the components of the gestures. For all three tasks, they demonstrated delays and perseverative behavior.

Some additional general types of responses were observed; many subjects had to repeat the verbalization or use verbal overflow accompanying the gesture and could not inhibit the response on request.

In summary, this pilot study has demonstrated that lesions in the left hemisphere may result in the impairment of both symbolic and nonsymbolic emblems, and that the deficits may be clearly defined in a qualitative category system. It is hoped that a study presently underway involving 39 aphasics and 37 normal adults will permit further elucidation of such questions as the relationship between the severity of aphasia, oral and limb apraxia, with gestural ability. The present category system could be used by clinicians to both describe gestural deficits and to assess the suitability of a gestural form of therapy for an individual patient.

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