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PRAGMATICS AND THE LANGUAGE-DISORDERED CHILD:

An Exploratory Study of Language Use

by

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Thesis submitted to the School of Graduate Studies and Research of the University of Ottawa, in partial fulfillment of the requirements for the degree of Master of Arts.

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ABSTRACT

The research involves the examination of a particular quality of language use by language-disordered children. Comparisons of children's gestural usage, in a variety of verbal contexts, are examined, by contrasting eleven developmentally-aphasic children with normal age-mates. It is hypothesized that the quantity and quality of gestures and speech produced by the disordered group, will change over time. Accordingly, eight older aphasic children were contrasted with their younger counterparts. All children in the study underwent the following routine: an observation period in a natural setting, and a structured session of four informal activities. Results indicate a very definite contrast between younger aphasics and their normal age-mates, as well as significant linguistic progress in the older aphasic group. However, certain aphasic children produce a particular form of non-directed language. The highly significant effects of these "discrepancies" on general language use is discussed.

PRAGMATICS AND THE LANGUAGE-DISORDERED CHILD: An Exploratory Study of Language Use

Chapter I: Introduction

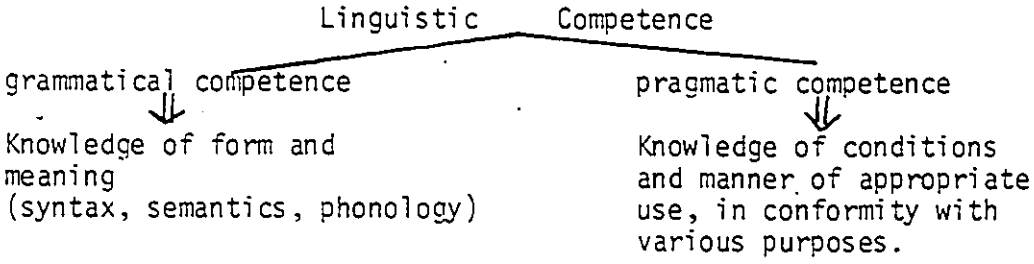
Language plays a significant role in the development of the child as a social being. Various patterns of experience are transmitted to the child through language. Gradually, we learn how to participate as an active member of society, to adopt its culture, modes of thought and action, its beliefs and values. It is through the accumulated experience and participation in a variety of events, that such fundamental knowledge is acquired. It is also through this same participation that the child truly learns how to effectively use his language.

This particular research will explore a relatively new area of language study: contrasting the quality of normal children's speech and gestures produced in various contexts, with those of language-disordered children.

There are certainly very specific patterns and rules in the organization of language and its use in particular contexts. The language system is built upon a variety of complex and interacting rules, involving syntax, semantics and phonology. Of equal importance, are the functional properties of language. For language is indeed made up of two very distinct, yet highly related areas. The first concerns the formal properties of its content: the "what" of language, revolving around the rules and structures in the phonological,

syntactic and semantic components. Secondly, language also comprises a rich variety of functional rules: the "how" of language, or pragmatics, which examines the particular use of language in a variety of contexts.

Indeed, Chomsky (1980) suggests that "Knowledge of a language", encompasses a variety of properties. Grammatically, the person who "knows" a language is capable of dealing with the physical form of a sentence and its meaning. Chomsky further suggests that the native speaker "knows" the conditions under which it is appropriate to use a sentence, knowing what purposes can be furthered by appropriate use of a sentence under given social conditions. Particular reference is then made to the native speaker's "linguistic competence", which is divided thus:



Pragmatic competence placing language, then, (Chomsky, 1980, 225) "...in the institutional setting of its use, relating intentions and purposes to the linguistic means at hand." Where it is understood that "institutional" refers to the social/cultural background within which language operates. Further, the "linguistic means", will vary according to the individual's mental and physical capacities within a particular experiential framework.

1.1 Pragmatics and Linguistic Inquiry

The term "pragmatics", is taken from the School of Pragmatic Philosophy, whose eminent proponent, Peirce (1940) suggested a theory of semiotics, based on three types of signs: icons, indices and symbols. Shortly afterward, Morris (1946), proposed a precise division in linguistic theory which included the following three areas:

1. syntactics: the study of the relations holding among signs.
2. semantics: the study of relations between signs and their referents.
3. pragmatics: the study of the relations between signs and their human users.

One major problem with the Morris definition of pragmatics is the exclusion of the concept of "context". Bates (1976) merged Peircian theory with Morris' definition, to propose the following definition of pragmatics: the study of indexical rules for relating linguistic forms to a given context. Currently, (Ochs and Schiefflin, 1979), (Bates et al., 1983) favour a simplified definition of pragmatics: the study of the rules of language use in context.

Linguistic analysis can then focus on three main areas of inquiry:

1) the formal properties of language, examining the fundamental concepts of an abstract system of signals.

2) the functional properties of language, examining the use of these same signals.

3) a combination or merging of the two areas of study: the formal and functional properties of language, examining the wide variety of operational rules of the system. Thus, it is equally important for the child to have an effective formal underpining of his language, as well as knowledge of its appropriate use. And it is through the effective contacts with others that the child gains his linguistic knowledge.

Interaction will certainly be the key referent in this particular examination of language use. By its very nature, the interactive process is a reciprocal one: individuals contributing and receiving from others, a vast array of information. The child learns through familial, peer and social encounters, how to interact in the multi-varied contexts of his daily routines. Effective communication involves, then, an active participation in the language exchange, enabling the participants to affect or alter the attitudes, beliefs or behaviors of one another. Lucas (1980) proposes that ideally, the child should be able to function as either speaker or hearer within the communicative act, cautioning however, that although a child's language may be rule-governed, unless he has specific ideas or intentions to express, language may appear non-directed or meaningless and thus, not effectively alter the attitudes and beliefs of others.

1.2 Focus of the Research

This research will focus on the study of a specific form of language use -- on the child's ability to select a particular verbal and/or gestural signal and manipulate it for certain social purposes. To add greater dimension to the study, a variety of children, with varying degrees of communicative ability will be examined to determine the significant impact of appropriate and effective language use. For the purposes of this research, "communication" will be defined as the meaningful exchange between interactants for the sharing of ideas, beliefs, attitudes ..., and "use" will determine the contours, the shape of the actual production within the communicative encounter.

The gestural system, being one of the earliest, prominent forms of communication (Jancovic et al., 1975), (Clark and Sengul, 1977), provides an important, if only partial operational framework for the study of pragmatics. If, as Bates (1976) suggests, more recent linguistic models are including context as an essential aspect of the structure of language, then an investigation of pragmatics should be a crucial aspect of developmental studies. It is further suggested that a comparison of normal and language-disordered children should yield particularly rich data concerning the role of context in the acquisition of language.

1.3 Three Fundamental Questions of Language Use

Over the years, a considerable portion of linguistic inquiry and research has focused on children's acquisition and

development of formal structures. The predominant concern centered around certain aspects of the child's verbal production, that is, what he actually said. Only in very recent years has the concept of pragmatics in child language been closely examined. Indeed, several functional designs of language interaction and structure are now being proposed: Schiefelbusch 1980; Lucas, 1980; and Rom and Bliss, 1983, all adding a further dimension to the study of child language development.

The study of language interaction must necessarily include the examination of more than the verbal output. Communicative interaction is made up of a variety of functional components: as well as the essential "who" of the interaction, we should be aware of the "when", "where" and "why" of the exchange, in determining its shape and quality. Psycholinguistic and sociolinguistic research has expanded the investigation of language development by examining these main issues. Indeed, three fundamental areas of inquiry in language development might be summarized as follows:

1) Why does a child need a language system?
2) What functions are served by language?
3) How does the child use his language?

From the onset, it should be specified that not all production can be qualified as language. Functionally, according to Halliday (1979), any vocal sound or gesture, which is interpretable by reference to a recognized function of language can be qualified as language, providing the relationship of sound/gesture to meaning is regular and consistent. The distinction is evidenced by contrasting the baby's babbling, playful sounds to himself - classified as non-interactive, where the child may

be learning, practising or playing with language, as opposed to the deliberate reaching and crying for a favourite toy - classified as interactive, where the child is using language for a specific purpose. Let us now consider the first question of our language development exploration: Why does a child need a language system.

There are certain functions language must fulfill in all human cultures, regardless of differences in the physical and material environment. These functions include:

1) organizing our world. Language can shape and categorize our reality, reducing the incredible variety of phenomena around and inside us, to manageable groups or classes, such as people, events, objects, actions...

2) language enables us to interact/communicate in our environment: to gain knowledge, and share our own beliefs, thoughts and attitudes, as well as altering or affecting those around us.

3) language gives us a certain identity and sense of community - of belonging to a particular group or culture.

What is being described is essentially a theory of organization, of socialization, achieved through a variety of interactions in numerous events. The child learns to function in various contexts, dealing with a wide assortment of situations and individuals.

The Concept of "Context of Situation".

The term "context of situation" was originally suggested by Malinowski (1923) and further elaborated by Firth (1957). Essentially, the theory implied that language is not experienced in isolation. Actually, we experience language in relation to some scenario or script, involving some background of persons, actions and events from which the things

that are said derive their meaning. This is referred to as "situation", and as such, language is said to function in "contexts of situation". The notion of situation should be qualified by the term "relevant", referring to those features which are relevant to the speech that is taking place. Such features are generally quite concrete and immediate, as is certainly the case of the language of young children. Gradually, the child is able to use language in abstract and indirect contexts of situations - "freeing" the interaction from the constraints of the immediate environment.

There are, of course, various "types" of "situations". The "type" of situation is the description of the actual communicative event: a parent reading a bedtime story to the child; a child asking the teacher for help; or again, a child explaining the rules of a video game to a friend... Bernstein (1971), suggests that some situation types play a significant role in the child's move toward adult language. Bernstein refers to "critical socializing contexts" - using the idea of "context" similarly to a general situation type. The following four critical contexts are identified (Bernstein, 1971):

1) the regulative context, where the child is made aware of the rules of the "moral order", a behavior code, with right and wrong distinctions.

2) the instructional context, where the child learns about the objective nature of objects and persons, and acquires skills of various kinds, e.g. how to tie his shoe.

3) the imaginative or innovating contexts, where the child is encouraged to experiment and recreate his world on his own terms, as in pretend play: a puppet show with friends.

4) the interpersonal context, where the child is made aware of affective states - his own and others; the child can express feelings appropriately.

The four contexts have a dual purpose: both in determining the importance of significant aspects of language use and also in establishing a process of language learning - how the child builds and expands meaningful units to his language repertoire.

It is interesting to note that children (and adults) move in and out of the various "contexts", with an equally fluctuating degree of success. That is, some children can feel very comfortable in the interpersonal context, interacting with many people, in many events. Other children find it incredibly difficult to move beyond an "Instructional" framework - fearful, or incapable of producing appropriate, original exchanges. This research will emphasize the dichotomy between the two groups: normally developing children who are able to effectively use and experiment with their language, and language-disordered children who, for a variety of reasons, cannot effectively process and communicate language, and appear "trapped" or locked into particular socializing contexts.

The second principle question of language development research involves the functions of language: What are we using our language for?

A child's initial understanding of the world is a product of sensory impressions that are combined into a cognitive/semantic map of

the environment. Through sensory input, the child receives vast quantities of information. He can then store and analyze what he perceives as relevant information and select a possible response. The model outlined in Figure 1, presents the various theoretical possibilities for a general communication system.

The environmental stimuli bombards the child/decoder with one, two or combinations of sensory data. The child processes the information and may select to encode a response. For example, the child, as receiver, perceives the sender waving his hand in greeting. The child processes the visual message, and associates the symbol with the shared meaning (symbolization) to select a possible verbal or gestural response. Both the input and output modes are quite self-explanatory. The processing mode demands further clarification. The child attempts to organize and sort the incoming and outgoing data. Linguistically, he can rely on certain formal structures to determine the smooth functioning of the language processing. Various hierarchical levels are observed: (based on Osgood, 1957)

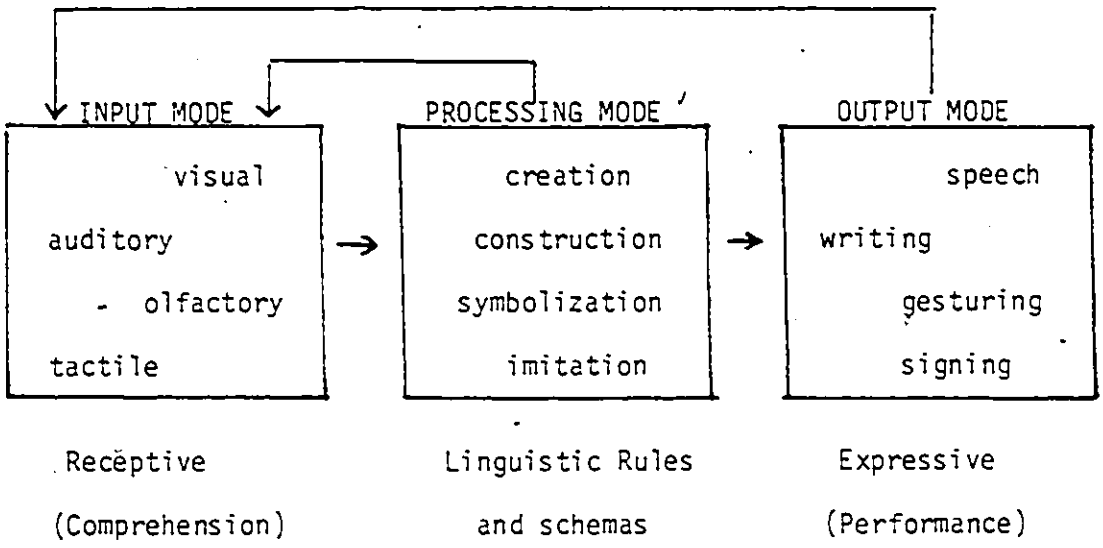
imitation: the first level of processing, where the child learns basic nonlinguistic conceptualizations of environmental events, such as eating habits, as observed from our social, cultural surroundings

symbolization: the child learns that "x" is the name of "y", which involves the labelling and organizing categories such as the item "book", the label for the large collection of printed paper with pictures.

construction: the child is learning to sequence symbols to form a sentence; as semantic and syntactic components progress, the child

FIGURE 1

MODEL FOR A GENERAL SYSTEM OF LANGUAGE



based on Osgood (1957) and Hollis and Schiefelbusch (1980)

moves from a single utterance to combined strings:

milk ---- give milk ---- give me more milk please.

creation/extension: the child's sentence forms demonstrate a knowledge of linguistic rules; the child can generalize rules and concepts and can create a linguistic exchange, corresponding to new events.

By the beginning of elementary school, most normal children have acquired integrated encoding and decoding skills, which enable them to effectively interact with, and influence their environments. For the five-year old, these pragmatic skills include: initiating communication, giving and following directions, narrating stories and taking turns. Hollis and Schiefelbusch, (1980, based on Chapman and Miller's personal communication) have outlined specific functions of early language:

1) To give information
   a. reference
   b. prediction
2) To get information
3) To describe an ongoing event
4) To get the listener to
   a. do something
   b. believe something
   c. feel something
5) To express one's own
   a. intention
   b. beliefs
   c. feelings

6) To indicate a readiness for further communication

7) To solve problems

8) To entertain

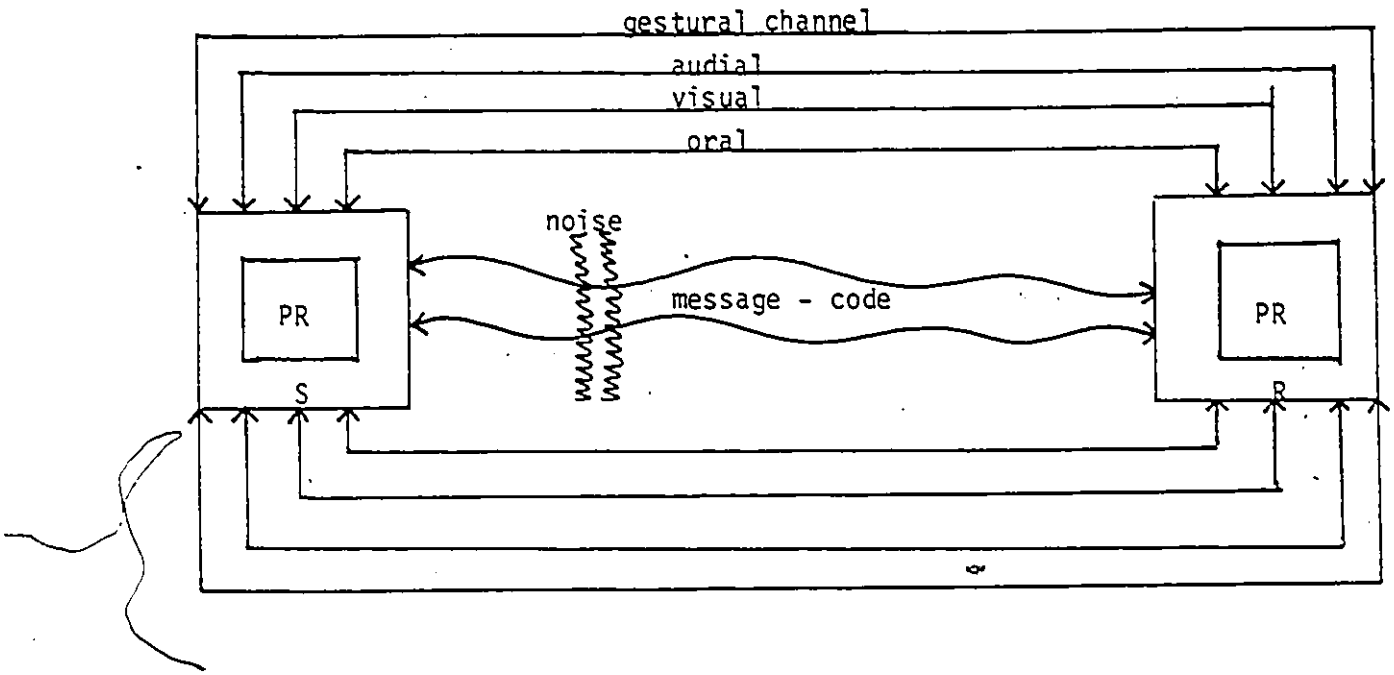
The eight functions closely ressemble Dore's (1973) concept of "speech acts", revolving around the ideas of: requests, denials, assertions and statements. As stated earlier, the effective communicative event will necessarily involve one (or several) of the above eight functions and, in some way, attempt to alter or affect the behavior, attitudes or feelings of the interactants.

Certainly, these early functions of language are maintained, in some capacity, throughout the child's life. Even within a few years of entering school, these early pragmatic skills provide the basis for the development of more complex linguistic tasks such as: reading, writing, group discussion and hypothesizing. Indeed, the development of effective communication skills becomes critical to social and linguistic growth. Being able to successfully interact through numerous experiences, in a variety of settings will determine the shape and quality of the child's pragmatic development. Which brings us to our third major question in language development: How does the child use his language.

We have seen the importance of the "why" and "what" of language for the developing child. We now examine exactly how the message involved in language interaction gets transmitted from one individual to another. Figure 2 (based on Cherry, 1965), suggests the procedures involved in any communicative exchange. The proposed language model outlines the linguistic channels which enable us to understand and choose

FIGURE 2

MODEL FOR AN INDIVIDUAL COMMUNICATIVE EXCHANGE



PR = processing routine

S = sender (encoder)

R = receiver (decoder)

Channel = modality, the message is: oral = verbal

audial = verbal

visual = gestural, graphic

gestural = nonverbal

alternative forms of language for reaching our particular communicative goals. The individual then able to select which "form" of the message best suits the "function" of the message.

The message or code originates with the sender who has processed relevant sensory input and, in turn, organized the appropriate "means" (channel or modality), to alter or affect the receiver, in some capacity. A great deal of information must be assessed in very little time to acieve a successful or effective interaction. Relevant details include:

1) who the receiver(s) is/are
2) state of the receiver: impatient, angry, inattentive
3) selection of appropriate channel of communication: verbal, gestural, graphic or a combination
4) the location of the exchange: library versus schoolyard
5) the type of communicative event: formal (adult/child) informal (peer/peer)
6) number of participants: dyad versus group
7) relationship of interactants: familial versus stanger
8) form of message to be coded: graphic, gestural or verbal
9) type of message: joke, statement, argument...

The interaction is necessarily two-sided: the encoder/decoder changing roles according to the purpose and function of the exchange. This turn-taking in itself is a significant pragmatic milestone for young language learners; determining how and when to correctly switch roles is central to successful communication. Shortly, we will examine the importance of language reciprocity in terms of language-disordered children. At any stage of the exchange, "noise" may be introduced.

Noise can be defined as any interference involved in the communicative process, which may include:

1) internal interference/noise: occurs either in the
   - i) sensory input
   - ii) processing mechanism
   - iii) output component
2) external interference: actual noise or interference distorts the message - as in many people talking at the same time, or, actual, loud, background noise.

If the message or code is not accurately transmitted, communication breaks down and the language exchange may prove quite negative for all participants. Certainly the possibility exists for the presence of internal or external noise, interfering with the communicative process. Yet, the message or code in itself may be distorted or misunderstood for a variety of reasons which include: the choice of modality, the choice of the particular words selected, the tone of the exchange - all affect our perception of the actual message. In a similar framework, Bernstein (1966) examined the pattern of educational failure in Britain and proposed a code theory to account for certain language and educational deficits in school children. One particular aspect of Bernstein's theory is of special interest: the specific language distinctions between the use of the "restricted code" and the "elaborated code", two very distinct polarities on a linguistic continuum, moving from the least implicit to most explicit uses

of language. The disparity is further outlined as follows: (Bernstein, 1966)

Restricted Code	Elaborated Code
- verbally implicit	- highly explicit version of language
- highly context-based use of language: involving a high frequency of idioms and clichés to express global concepts	- no assumptions are made about hearer's/decoder's knowledge
- extensive use of elliptical references to shared knowledge	- involves use of expressions that assume little prior knowledge from speakers, listeners and speech settings
- frequent substitution of pronouns and other deictic expressions in place of explicit noun phrases.	- highly detailed, descriptive language.

The following is a specific example showing the distinction between the codes:

Restricted Code: "What's-his-name put the thingy in there."

Elaborated Code: "Mr. Jackson put the broken ladder in the garage."

One advantage to the restricted code is its economy of language - since so much shared information is assumed, fewer signs are supposedly needed to communicate the message. The elaborated code may be preferable when the sender knows little about the receiver or the particular circumstances in which the messages are exchanged. The sender thus assumes little and conveys a great deal of information.

In examining the quality of the communicative exchange in certain language-disordered children, it is interesting to note the over-extended use of a very restricted code, highly contextual in

nature, where the high percentage of "shared information" is assumed or taken for granted by the child. This particular problem contributes to the significant discrepancy in the shape and quality of language used by language-impaired children and their normally developing age-mates. It is now appropriate to examine the language-disordered child's linguistic organization and use.

The child who exhibits a problem in pragmatics has difficulty being effective in altering the beliefs, attitudes and/or behaviors of a receiver. This same child may also express difficulty in acquiring the semantic or meaning-based rules that govern the use of linguistic skills for communication. To summarize, the pragmatic problem may occur in any of the following four areas:

1) in developing the pragmatic rules.
2) in establishing a desire or motivational cause to express some intent.
3) having a need to communicate to another.
4) in being capable of actively participating in the process.

1.4 Pragmatic Problems and the Language-Disordered Child.

It is apparent that some language-disordered children do not have the social ability to differentiate or alter their own behaviors. For example, while most children, (from the age of 5½ years) face a receiver while communicating, some language-disordered children will begin to speak and gesture, unaware of the readiness of the "other".

Consequently, the child does not affect the hearer in the desired manner. This lack of effectiveness only adds to the negative value the child places on the communicative task. When the child is taught to signal the receiver, either through eye contact, or by using a verbal or gestural cue, the child is much more successful and the communicative task takes on positive value. In the same manner, if the child "locks into" a particular stage or level of communication processing, such as, imitation, he may be restricting his linguistic development and greatly limiting his capacity as an effective communicator. The child who merely responds to productions made by others - either through direct imitation or by performing language tasks that are not attached to meaning, is not using language effectively. Thus, the child who is "off target" in responding, is not taking in the reciprocal quality of the exchange. In attempting to respond, he may not be scanning the previous utterances or the surrounding context for appropriate referent possibilities. If the child cannot determine the referent, then the utterance and gesture produced, may also be referentially "off target".

The term "exchange" denotes that the child is part of a sender/receiver paradigm, in which he should be looking and listening, while sending his own message - thus, monitoring his own production. The child should also be watching and listening to what the other sender produces. In attending to these environmental, contextual cues, the child is gaining awareness of appropriate responses to various sets of information. This reciprocal procedure implies duality.

If a child does not respond or initiate as expected, then the receiver's initiation and response may also change. The child's primary interactants: family, peers, school contacts, begin to expect less (or assume more) in the communicative interaction. Lucas (1980) observes that as the general communicative expectation of the "other" decreases, then the intention or purposive aspect of social language will also decrease.

The child who is not able to respond "on target" is experiencing difficulty with processing or decoding the sensory input, therefore difficulty attaching the sign to its meaning. Certainly, if the child's perception of the environment is different from others' perceptions, then the child will process the symbols differently and possibly attach the meanings differently. If the problem is not contained and remedied, Lucas (1980) believes errors may generally increase in frequency as the child's knowledge and expected linguistic skills become more complex.

Even though the language-disordered child may develop the basic formal properties of language (fundamental concepts of phonology, syntax and semantics may seem intact, developmentally), an understanding of the social implications of language may not be clear. Thus, the child may have the grammatical knowledge, but not the skills, to use the necessary linguistic patterns to convey the message he intends. The impact on the child's general development can be devastating. Watzlawick et al. (1967) suggest that we are especially susceptible to "pragmatic inconsistencies", behavior that

is "out of context", or that shows a certain kind of randomness or lack of constraint. Indeed, pragmatic miscues strike us as much more inappropriate than a syntactical or semantic error. And yet, it is precisely in this area of pragmatic development that we have largely overlooked the importance of the rules of language use for successful interactions, and, subsequently, the rules being broken in disturbed communication.

1.5 The Importance of Gestures

Although the area of pragmatics involves the examination of the rules and structures of effective and appropriate language use, there is one particular communicative modality that has been largely overlooked: the gestural channel. The study of communication through gestures has been greatly overshadowed by the vast quantity of verbal language studies. It should be stated that gestures are very closely aligned to speech, and an examination of the gestural use of certain specific, meaningful movements, in a verbal context should yield further insight into the language development question generally.

Specifically, this research will attempt to examine the same pragmatic questions stated earlier: the "why", "what" and "how" of particular gestures in both normal and language-disordered children in a variety of interactions. For the purposes of this research, "gesture" will be defined as follows: (based on Bates, 1983) a manual sign of a conventional means of communication, insofar that

it is recognized or agreed upon by a "community", involving at least two members. Bates further suggests criteria for establishing a sign or gesture as a convention:

1) it occurs in stable, and even stereotype form.
2) it can be recognized by both the observer and the sender himself.

thus eliminating all non-communicative, reflexive or automatic gestures, such as scratching or finger tapping ...

Why the study of gestures particularly? The three dominant reasons involve the following:

1) gestures are an integral part of communication, early arriving - ontogenetically prior to speech. (Wilcox and Howse, 1982)
2) to date, limited research has specifically examined the quality and use of gestures in various contexts.
3) not only do gestures further establish our identity as social beings, belonging to a particular culture or group, gestures also contribute overwhelmingly to our communicative ability.

Bloom and Lahey (1978) hypothesize three chronological levels in the development of language use:

1) birth to 1 year: the level of primary forms, where the same behavior: crying, smiling or pointing (deictic gestures) can be used to meet several needs, regardless of situation.

However, Bates et al. (1983) suggest that even the linguistically immature infant, of three or four months, is capable of manipulating people and objects in his environment. The infant's reaching for a toy, while vocalizing, is certainly an effective form of communication. The observer recognizes the motor act just as effectively if the young child had said: "Please give me the toy". Bates (1983) further suggests that the child's intended purpose for performance of the motor and preverbal acts, appears to establish the function of communicative acts. Similarly, Werner and Kaplan (1963) propose that the first gestures that are consistent with the gestures of the community include giving and pointing. Pointing, which originates as an exploratory tool, establishing distance between the infant and external objects, evolves into a conventional communicative gesture, involving a recipient. Most early gestures being then, precursors to the pragmatic rules of interaction: the infant beginning to learn the pattern of social and linguistic rules.

2) 12 - 24 months: the level of conventional forms: children's movements and vocalizations become more consistent with those around them. The child's needs continue to become more social.

Young children are capable of connecting and using more and more sounds and signs that are part of their language. Dore (1975) describes the performance of these early "speech acts", as

serving three purposes: affective, cognitive and communicative functions. The child using his language for both social and personal needs. Gesturally, the two year old uses a considerable amount of deictics, often accompanied by the verbalized: "What's that?". Pantomimic or emblematic gestures increase in frequency such as: waving, motioning to come closer, and "be quiet".

3) 2 - 3 years: level of conventional use:
children learn that there are alternative means or forms for achieving the same purpose, according to differences in the situational context.
e.g. pointing to the fridge and saying: "Juice"
or asking: "Some juice, please."

As the child develops, the gestural repertoire expands, integrating a variety of nonverbal components to the increasing verbal capacity. Illustrators, gestures that accompany and amplify the spoken message, such as indicating size and shape now appear in the child's language.

It would seem that older children tend to use a different type of gesture accompanying speech. While the under eight-year old largely uses pantomimic or descriptive gestures, older children tend to accompany their verbal output with more subtle "relational" gestures. Relational gestures (Jancovic et al., 1975) resemble the gestures which accompany adult speech, enhancing or modifying the verbal output and having a direct bearing on the relationship of the interactants. For example, one friend would motion to another to speed up the flow of conversation and "get to the point."

A variety of language studies (Poon and Butler, 1972; Jancovic et al., 1975; Evans and Rubin, 1979, and Wilkinson and Rembold, 1981) have concluded that it is essential to consider both verbal and nonverbal components in the examination of linguistic performance. The above findings reveal that not only do gestures supply supplementary information to verbal communication, but gestures are often facilitators of communication, reemphasizing that the study of expressive language should be evaluated as a whole system.

In the early 50's, Myklebust (1954) explored the use of gestures as a diagnostic variable in the evaluation of auditory disorders in children, and found that deaf, autistic, retarded and aphasic children could be differentiated by a qualitative and quantitative analysis of their gestures. Much more recently, Rom and Bliss (1983) examined six "pragmatic behaviors" in both language impaired and normal children. Although use of distance, physical contact, vocalizing, smiling, eye contact and play were examined, the actual use of gestures was overlooked. This is interesting, since the relevance of gestures in language development has received considerable theoretical support. In examining the spoken messages of normal children under the age of eight, Piaget (1959) claimed: "...gestures play as important a part as words", and constitute: "...the real social language of the child". Michael and Willis (1968) further examined the use of gestures in children aged four to seven years. A preliminary investigation determined the twelve most

frequently used gestures in a verbal context. These same gestures will form the core of this particular research and include:

be quiet	shape
go away	I don't know
come here	goodbye
how many	hi
how big	raised hand for attention

"Yes" and "no", largely head gestures, were omitted and replaced with the prominent deictic gestures:

here/this	(proximal)
there/that	(non-proximal)

based on Clark and Sengul (1972). The gestural distinction between "you" and "me" will also be included in the research, for a total of fourteen (14) gestures. A full description of each gesture is included in Appendix A.

1.5.1 Gestures: Three Basic Groups

Gestures can also be grouped and categorized (Ekman and Friesen, 1969, and Jancovic et al., 1975). The following divisions are examined in this research, based on a compilation of the above studies:

1) Deictics: that/this -- demonstrative pronouns
there/here -- demonstrative adverbs
you/me -- personal pronouns

where deictics specifically refer to pointing movements, denoting or specifying the spatial location of a concrete object or event

(whether "here and now", or otherwise). "Here" is proximal since it points to where the speaker is; "there", non-proximal, pointing to where the speaker is not. The same holds for "this" and "that" -- "this" indicating an object near the speaker, "that", one away from the speaker. (based on Jancovic et al., 1975)

2) Emblems: come here
go away
I don't know
raised hand for attention
be quiet
number (how many)
goodbye
hi

where emblems specifically refer to: those nonverbal acts which have a direct translation, or dictionary definition ... and are well known by all members of a group or culture. (based on Ekman and Friesen, 1969)

3) Illustrators: how big (size)
shape (round, square...)

where illustrators specifically refer to: the class of nonverbal behaviors which augments or amplifies the information provided verbally (based on Efron, 1941 and Ekman and Friesen, 1975).

This particular research will further investigate the quality of gestures in specific communicative exchanges, as well as examining the purpose and context of the message. That is, the following information will be observed and recorded for each child, in both natural and structured environments:

1) laterality: the use of the right, left or both hands/arms in producing the gesture.
2) frequency: the number of occurrences of the gesture in a specific time frame.

3) modality: unimodel - gesture only (GO)
- speech only (SO)
bimodel - gesture and speech (G&S)

4) location of the communicative event: classroom, gym...

5) condition of exchange: dyad versus group
formal (adult/child) versus informal (child/child) interaction.

1.6 Two Hypotheses

In a recent study, Morehead and Ingram (1973) sampled the language performance of a group of developmentally aphasic children and compared it with that of normal children at a comparable level of linguistic ability - as determined by Mean Length of Utterance (MLU). They reported that similar rules of grammar were used by both groups of children. Both normal and aphasic children expressed the same grammatical relations, but it appeared that the aphasic children were slower to learn to coordinate these relations in sentences. The major differences between the two groups were: delay in onset and slow rate of acquisition of language. They concluded that the language of aphasic children could be described as the result of delayed instead of qualitatively different language development. The same forms were used but were learned at a slower rate and were used less frequently by the aphasic children.

The question arose as to whether the same conclusion could be drawn from an examination of the pragmatic or functional properties of language development. It was hypothesized that gestural

communication would be significantly different between normal children and their linguistically disordered age-mates. It was also suggested that the gestural productions of the disordered group would change over time, that is, the quality and quantity of specific nonverbal communication would vary between younger and older developmentally aphasic children.

Succinctly stated, the hypotheses to be tested in the research are as follows:

1) Language-disordered children use gestures in a verbal context, but, use these gestures differently, such that a qualitative and quantitative difference is observed as contrasted with normally developing age-mates.
2) The quality and quantity of gestures processed and produced by language-disordered children changes over time.

The following chapters will detail the specific methods, procedures and results of the research outlined above. Specifically, the first part of chapter two will examine the methods involved: who the subjects are, and the nature of the tasks presented to them. Part two of chapter two will focus on the actual procedures themselves: the tasks performed in both a natural and structured environment, as well as outlining the statistical analyses involved. Chapter three will be restricted to the full description of the results of all research. Chapter four will present a rather striking commentary and discussion of the results, while chapter five summarizes and concludes the research and findings.

Chapter II: Method

The first part of the chapter will outline the research design, followed by an examination of the selection of subjects, while briefly describing the tasks required of them. In the third section of the chapter, the procedures will be fully described in both their natural and structured settings. Finally, section four will outline the statistical analyses used in all parts of the research.

2.1. Design of the Research.

The identical framework was used in examining both Hypothesis I and Hypothesis II. (see Figure 3). Data was collected according to the following pattern: 1) natural setting observation

2) structured setting activities

1) Natural setting observation.

Specific gestures and speech were observed and recorded for all three groups of children, (normals, young aphasics and older aphasics), during a thirty minute period.

Hypothesis I examined the gestural difference between the normal group (group 1) and the younger aphasics (group 2).

Hypothesis II explored the possible developmental differences observed in the younger aphasics (group 2) as contrasted with the older aphasics (group 3).

Both hypotheses explored the following variables:

1. types of gestures: a. deictics
   b. emblems
   c. illustrators

Figure 3

Design of the Research

Spontaneous Speech - Natural Setting

Gp 1 = Normals
Gp 2 = YA
Gp 3 = OA

Hyp 1	Hyp 2	1			2			3			
		a	b	c	d	e	f	g	h	i	j
Gp 1 n = 11	Gp 2 n = 11										
Gp 2 n = 11	Gp 3 n = 8										

1 = types of gestures
a = deictics
b = emblems
c = illustrators

2 = modality
d = GO
e = SO
f = G&S

3 = com. event
g = dyad
h = group
i = informal
j = formal

Informal Tasks - Structured Setting

Hyp 1	Hyp 2	1	2	3	4
Gp 1 n = 11	Gp 2 n = 11				
Gp 2 n = 11	Gp 3 n = 8				

1 = Imitation Task
2 = Identification Task
3 = Match Game
4 = Show Me

2. modality: d. gesture only (GO)

e. speech only (SO)

f. gesture and speech (G&S)

3. communicative event: g. dyad

h. group

i. informal

j. formal

2) Structured setting activities.

The identical subject groups were maintained for the examination of Hypothesis I and II, for the administration of the four tasks:

1) Imitation Task

2) Identification Task

3) The Match Game

4) The Show Me Game

2.2 Subjects.

Examination of Hypothesis I: that language-disordered children use gestures differently than normally developing age mates. Two groups of children were contrasted:

Experimental Group: 11 developmentally aphasic children, ages 5-7 years.

Control Group: 11 normal children, matched for sex, age and socio-economic status.

All children attend the same public school. The 11 aphasic children are enrolled in a Special Education program at the school, grouped according to ability rather than age. Placement in the program was the

result of a team assessment at the Children's Hospital of Eastern Ontario (CHEO), when the children were two or three years of age. The aphasic children also receive periodical speech and language assessments at the school. All normal children attend either the kindergarden or grade one classes at the same school. Minimal contact was observed between the aphasic group and the normal children; even in the school yard, children tended to play with their classmates, or alone.

Hypothesis I was tested in two areas:

1) observation of the individual subjects in a natural setting
2) on the individual performances on a series of four informal tasks in a structured setting.

Examination of Hypothesis II: the quality and quantity of the speech and gestures processed and produced by the language-disordered children changes over time. Two groups of children were again contrasted:

11 younger aphasic children, ages 5-7 years.

8 older aphasic children, ages 8-11 years.

A total of 19 aphasic children, again, all from the same school. It was believed that the use of language by the developmentally aphasic children underwent significant changes, over time. Age then became the independent variable for establishing possible chronological changes in the communicative ability of this group.

The fourteen gestures involved in the research are normally fully processed and internalized by the seventh year in normal children. It was determined that contrasting the older aphasic group with normal age-mates would serve no significant purpose, since ceiling is attained

in normal children by age seven. (for older children's use of gestures, see Jancovic et al, 1975) Further, significant linguistic improvement in the aphasic group was anticipated over time. However, contrasting the language production of older aphasic children with younger normal children was also rejected, under the assumption that the older aphasic children's scores would greatly inflate the informal tasks' scores in their favor. (for a comparison of all scores from all three groups, see table 5).

2.2.1. Definition of Developmental Aphasia.

The term "developmentally aphasic" (synonymous with "congenital", "childhood" or "infantile aphasia), will apply to children whose language problems are congenital rather than acquired. Rapin and Wilson (1978), define a child as having a developmental language disability if he fails to develop and use language for communication..."providing that hearing loss, cognitive and motor deficits and behavioral disorders are judged insufficient to account for the extent of the language impairment." Zangwill (1978) suggests that the outstanding handicap of developmental aphasia is social and educational rather than physical, and that sensory or motor deficits of any severity are seldom in evidence, or as Stark (1980) remarks, no hard neurological signs or evidence of neuropathology are present. The aphasic problem is viewed then, as cognitive-linguistic in nature. Finally, Eisenson (1972) proposed the additional term "a-phasic", ..."by hyphenating a-phasic, we are directing attention to the out-of-phase developmental background of congenitally aphasic children.

In general, males outnumber females in the language disordered population, as high as 8 to 1. (Stark, 1980). The younger aphasic group in this research, numbered 11, with only 1 female, while the older aphasic

group was composed of 8 children, 6 male and 2 female.

Aphasic children certainly do not present the expected patterns and correlations of their age-mates. Indeed a variety of differences are observed in their general sensory, perceptual and linguistic abilities. It is hoped that research into specific pragmatic differences between aphasic children and their normal counterparts will enlighten the acquisition question generally.

2.3. Procedure.

All children (19 aphasics and 11 normals) underwent the following routine:

1) a thirty minute observation period in a natural setting.

2) a series of four informal tasks to determine the gestural comprehension and production capacity of the subjects. No standardized tests are currently available to determine gestural usage in the specific verbal contexts examined here. Of course, several tests do include non-verbal/gestural components in their battery; these include:

a) The Manual Expression subtest on the Illinois Test of Psycholinguistic Ability (ITPA, 1968).

b) The Intraverbal Gesture subtest of the Parsons Language Sample (PLS, 1963).

c) The Carrow Screening Test for Auditory Comprehension of Language (STACL, 1974).

d) The Environmental Language Inventory (ELI, 1974)

The four tasks involved in this research were generally based on a compilation of the standardized tests just cited; the specific focus being the testing of the child's comprehension and production of particular

gestures. The four informal tests include the following:

1) the Imitation Task
2) the Identification Task
3) the Match Game
4) the Show Me Game

In addition, spontaneous speech in the same structured environment was also observed and recorded for each child. Finally, after all testing and observation was completed, a short nine-item questionnaire was distributed to the parents and teachers of each child. It was hypothesized that the additional input would add a further dimension to the child's use of language, both at school and at home. Full detail of the precise nature and organization of the tasks follows immediately.

2.3.1. Materials and Tasks

It should be noted that procedures for testing both Hypothesis I and II followed a similar pattern. That is, information was gathered from three particular areas:

1) Observation of each child in
   i) a natural setting
   ii) a structured setting (the description of the procedure for the observation in a structured setting will be outlined in section 5 of the Informal Testing area.
2) Informal Testing in a structured setting
3) Parental/Teacher Report Data.

2.3.1.1. Observation of the child in a natural setting

The observational period involved thirty minutes of direct observation of each child in a variety of environments:

in the classroom

in the gymnasium

in the lunchroom

in the school yard

at the swimming pool (the school is equipped with an indoor pool and swimming is part of the curriculum)

The examiner was allowed to informally observe and participate in several daily activities in each classroom, prior to formal observation and testing, to enable the children to adjust and familiarize themselves with a new presence in the room. This was particularly beneficial in the normal kindergarden room, where children were not as accustomed to full day observation by "outsiders". Indeed, the aphasic children are quite accustomed to a variety of observers in their classroom, on a regular basis.

This initial contact with the children also provided the examiner with an extensive look at the daily routines of each classroom. Appropriate time slots were selected maximizing the observation and recording of various communicative exchanges. Optimal times proved to be the following for all classes:

1) during arrival activities: greetings and settling in routines.
2) "circle time": daily news routine, includes date, weather, shared news, either spontaneous or elicited.
3) play time: free time for the children to select one activity, either alone or in groups.(this was a particularly good time for observation at the pool).

Generally, the thirty minute observation period was continuous and in all cases preceded the informal testing.

The particular communicative situations examined were the following:

1) in a dyad (two participants) or in a group (three or more participants).
2) formal situations: the child interacts with: the teacher
   the examiner
   another adult
3) informal situations: the child interacts with another child, either younger, the same age, or slightly older.

All observations were indicated on the recording sheet (see Appendix B, sheet entitled: Observation, Natural Setting) and tabulated the following information:

1) laterality: whether the child used the right hand, the left hand, or both hands to perform the gesture.
2) modality: whether the gesture only (GO) was produced,
   speech only (SO)
   gesture and speech combined (G&S)
3) communicative event: whether the gesture was produced in a dyadic exchange or group; and whether communicated informally (to a peer), or formally (to an adult)

The frequency of the gestures was checkmarked (✓) in the appropriate slot on the recording sheet and tabulated accordingly, for the half hour period.

2.3.1.2. Informal Testing in a Structured Setting

All informal tests were conducted in a small quiet classroom. All tests were administered to each child by a two-member team: the examiner and a recorder. The examiner presented the battery of visual and verbal stimuli to the child, and recorded the child's responses on the recording sheets. The recorder also wrote the child's response on a separate set of recording sheets.

The Tasks.

1) Imitation Task: testing gestural production.

Goal: The child is asked to reproduce the gestures exactly as he sees them. This simple task verifies that the child has no obvious physical/motor problems that would interfere with the accurate production of any of the fourteen gestures.

Laterality (hand preference) is noted, as well as accuracy of production.

e.g. The examiner (E) asks the child: Do just like me.

E then performs the gesture, such as waving "goodbye" , or pointing "there", and the child imitates.

As in all four tests, two pre-test items were included: the first being a shivering/hugging gesture, using both hands and arms and indicating "cold", and the second being the wiping of the forehead with the back of the hand, indicating "hot".

All 14 gestures were then produced by the E, according to full descriptions given in Appendix A. This comprehension task was thought to be a good introduction to the various activities for two significant reasons:

1) the imitation task is simple and non-threatening: instructions are basic and obvious.

2) the task is gestural only, and for shy, quiet children, a positive way of initiating test activities. (for the two non-verbal, aphasic children, this imitation task proved crucial)

An example of the recording sheet, entitled "Imitation Task" is found in Appendix B.

2) Identification Task: testing the comprehension of gestures.

Goal: Can the child identify the meaning of the 14 gestures produced by the E.

The E used the right, left and sometimes both hands (e.g. for the gesture of "shape"), in producing all gestures as described in Appendix A. Only gestures were used; no speech was produced by E.

e.g. E asked the child: What does it mean when I do this?

E motioned with the right index finger to come closer/here. The child then responds. Again, the same two pre-test items were used:

shivering - cold

wiping forehead - hot

The recording sheet simply indicates whether the child can or cannot identify the gesture produced by E. An example of the recording sheet, entitled "Identification Task", is found in Appendix B.

3) The Match Game: testing the comprehension of gestures in a specific context.

Goal: to determine if the child can identify gestural use in a specific context.

A large picture book is presented to the child. Two 8 x 10 color photographs appear on each page of the book. The pictures involve children performing a variety of gestures in different contexts. (a sample of the picture book is included in Appendix B). The child is asked by the E to look at both pictures carefully, and to point to the picture that matches what the E says.

e.g. E says: Point to "I don't know".

The child looks at both pictures and points to the correct picture. The task is based on the Carrow Screening Test for Auditory Comprehension. Two pre-test items were also included, along with the same group of 14 gestures. The pre-test items include:

i) I'm going to hit you (picture of a boy with fist raised)

ii) I've got a secret (child whispering into another's ear)

The recording sheet indicates whether the child can or cannot associate the words with the picture of the gesture.

An example of the recording sheet, entitled: "The Match Game", is found in Appendix B.

4) The Show Me Game: testing both the comprehension and production of gestures.

Goal: does the child know the meaning of the gestures and does he use the appropriate signs to accuratly produce them.

The child was instructed by the E to use his hands, arms and fingers only, to produce the appropriate 14 gestures.

e.g. to elicit the gesture for "come here". the E's instructions were: If you had to be quiet, and you were over there (pointing away). and you

wanted me to come to you, what would you do? (based on Michael and Willis, 1969). The recording sheet indicates the laterality used in the performing of the gesture and whether the child can or cannot produce the gesture. Again, the same two pre-test items were used:

1) shivering for cold
2) wiping forehead for hot.

An example of the recording sheet, entitled: "The Show Me Game", is found in Appendix B.

5) The Spontaneous Speech of the child in a structured setting.

Goal: to see if the child spontaneously uses gestures in a structured environment, that is, when specific speech or discourse is elicited by E.

Verbal/gestural exchanges were encouraged by using the following three topics:

1) child gives instructions on playing his favorite game/ puzzle.
2) child gives directions on getting around the school: to the pool, the lunchroom...
3) child is asked about a favourite hobby/interest (as noted by E from earlier classroom observation, e.g. D.L. and the dinosaur fights.)

The recording sheet indicates: laterality, as well as modality (GO, SO or G&S productions). An example of the recording sheet, entitled "Spontaneous Speech", is found in Appendix B.

2.3.1.3. Parental/Teacher Report Data

A short, nine-item questionnaire was distributed to both the

teacher and the parents of each child involved in the study. It was hypothesized that the additional input would add a further dimension to the examination of the child's use of language.

The questionnaire involved nine different questions. Responses were checkmarked (✓), generally according to three responses, such as:

sometimes never always

The principle focus of the questionnaire was on the adult's perception of the child's communicative ability, examining the following main areas:

1) does the child use his hands and arms to enhance his verbal message.
2) does the child prefer to play alone or with one or two others.
3) does the child have the ability to cope with another task while communicating.

Lucas (1980) states that pragmatic disorders in children are generally characterized by the child's inability to organize his message properly. Either the rules of discourse are broken, that is, turn-taking miscues are observed, or the child may neglect to watch the interactants, or; again, the child cannot organize and focus his attention on the main topic, such that, if two or more modalities are involved, the message becomes distorted.

The parent/teacher questionnaire was distributed after the observation and informal testing of each child had taken place. An example of the questionnaire, entitled: "Parent/Teacher Questionnaire", is found in Appendix B.

2.4. Statistical Analysis

Three different statistical procedures were used in analyzing the data:

1) To determine the existence of a relationship between the variables on the gestural data accumulated during Observation in a natural setting, separate chi square analyses were performed on the scores obtained from both group divisions:

i) normals (N) versus younger aphasics (YA)

ii) younger aphasics versus older aphasics (OA)

That is, 3 x 2 and 2 x 2 contingency tables were analyzed as follows for both { N vs YA / YA vs OA } :

i) 3 types of gestures (deictic, emblem or illustrator) x 2 groups.

ii) 3 modalities (GO, SO and G&S) x 2 groups.

iii) 2 communicative events (dyad, group) x 2 groups.

iv) 2 communicative events (formal, informal) x 2 groups.

2) A one-way analysis of variance (ANOVA) was obtained to determine whether the two divisions { N vs YA / YA vs OA }, differed significantly on the results of the tasks performed in a structured setting.

3) Finally, in order to determine the reliability of the Examiner's scores, correlation coefficients (Pearson's r) were computed across scores on all four informal tasks, establishing agreement between the Examiner and the Recorder's scores.

A second measure of reliability was obtained by detailing inter-scorer agreement across four subjects (based on Goodglass and Kaplan, 1963). Four randomly selected subjects were videotaped during the four informal tasks' session. The color tapes were observed and scored independently by five scorers, each scorer thus being responsible for 16 ratings. All scorers were given verbal directions and the Examiner stopped the videotape and replayed certain portions on request. Percentage scores (based on Brown, 1976) were used as an index of the consensus of agreement across all five scorers and the Examiner.

These specific reliability measures will be discussed immediately, at the onset of chapter three followed by detailed results of all the statistical procedures.

Chapter III: Results

The chapter is divided into three sections. The first section will detail the results of the reliability measures followed by the results obtained in the examination of Hypothesis I and Hypothesis II, respectively. As outlined in the previous chapter, the research design is divided into the following two areas, for the analysis of each hypothesis:

1) Observation in a natural setting
2) Informal testing in a structured setting, which includes the examination of spontaneous speech produced in a structured setting, and examines the results of the Parental/Teacher questionnaire.

3.1 Results of the reliability measures

Correlation coefficients (Pearson's r) were computed across the three groups: Normals, YA and OA, for the four informal tasks, for a total of 12 Examiner/Recorder correlations. Nine of the twelve results were in the .93 range and above, one at .80, and two perfect positive correlations of 1 were obtained. Table 1 details the precise correlations for each test. The .90 range placing the Examiner/Recorder correlation in the very high positive range.

The second measure of reliability involved the inter-scorer agreement, between five scorers and the Examiner. The results on the four informal tasks were scored for four subjects. Percentage score agreement was the following:

Table 1

Correlation Coefficients (Pearson r)
across Informal Tasks

	Imitation	Identification	Match Game	Show Me
Gp. 1 Normals	r = .96	r = .96	r = .98	r = .93
Gp. 2 YA	r = .94	r = .99	r = .99	r = .98
Gp. 3 OA	r = 1	r = .80	r = 1	r = .96

Of the total of 16 ratings (4 test scores x 4 subjects) 100% agreement was obtained 9/16 scores (that is, 5/5 scorers agreed with the E.)

80% agreement was obtained 1/16 scores

60% agreement was obtained 4/16 scores

40% agreement was obtained 1/16 scores

20% agreement was obtained 1/16 scores.

For a complete listing of individual test scores, indicating inter-scorer agreement, see Table 2.

3.2 Hypothesis I

Restatement of Hypothesis I:

Language-disordered children use gestures differently than normally developing age-mates.

3.2.1 Observation in a natural setting

Time frame = thirty minutes per child. The three variables examined were:

1) the frequency and variety of gestures used in the specific time framework.
2) the modality of the production: gesture only (GO)
   speech only (SO)
   gesture and speech (G&S)
3) the type of communicative event:
   i) dyad versus group
   ii) informal (peer/peer) versus formal (adult/child)

Table 2

Inter-scorer Agreement

	Imitation			Identification			Match Game			Show Me		
	E	J	% Agre	E	J	% Agr	E	J	% Agr	E	J	% Agr
C_1	13	3 = 13 2 = 14	60	11	5 = 11	100	9	4 = 9 1 = 8	80	13	3 = 13 1 = 10 1 = 14	60
C_2	14	3 = 14 1 = 13 1 = 11	60	11	2 = 11 1 = 12 1 = 10 1 = 5	40	11	5 = 11	100	12	3 = 12 2 = 13	60
C_3	14	5 = 14	100	12	5 = 12	100	12	5 = 12	100	13	5 = 13	100
C_4	13	1 = 13 2 = 14 2 = 10	20	13	5 = 13	100	12	5 = 12	100	14	5 = 14	100

C_1 - 4 = 4 children
E = examiner's score /14
J = Distribution of 5 judges scores

% Agr = percentage agreement of judges' scores with Examiner's score.

Two groups of children were examined:

Group 1 = the control group, made up of eleven normally developing 5-7 year-olds.

Group 2 = the experimental group made up of eleven developmentally aphasic 5-7 year-olds.

The thirty minute observation period revealed the following information: see Table 3, Normal vs Younger aphasics.

3.2.1.1 Frequency and variety of gestures

It should be noted that throughout these results, the cut-off level for statistical significance was .01, unless otherwise indicated. Further, all χ^2 analyses were based on the frequency table presented in table 3.

A significant difference in the type and quantity of gestures produced is observed across the groups (1,2). It was hypothesized that YA would use a considerably larger amount of deictics in their gestural selection than normal age-mates (recalling that deictics are chronologically early-arriving and frequently used). Table 3 shows the frequency distribution of deictics, emblems and illustrators for both YA and normals. Chi square analysis revealed significant differences between groups 1 and 2: $\chi^2(2) = 58.436$, $p < .01$. There is certainly grounds for rejecting the null hypothesis, which states that no relationship exists between the variables. Indeed, a strong association exists between the type of gesture used and the group performing the gesture.

Specifically, a total of 310 gestures was observed by the E. Of this total, 53.2 percent of the gestures were produced by YA,

FREQUENCY AND TYPES OF GESTURES - OBSERVATION NATURAL SETTING

TABLE 3

	NORMALS			YOUNGER APHASICS			OLDER APHASICS		
TOTAL SUBJECTS	11			11			8		
X AGE	6,0			6,3			9,9		
	total	X	%	total	X	%	total	X	%
TOTAL GESTURES per 30 MINUTES	145	13.2	46.8	165	15.0	53.2 56.9	125	15.6	43.1
DEICTICS	54	4.9	37.2	124	11.3	75.2	56	7.0	44.8
EMBLEMS	90	8.2	62.1	33	3.0	20.0	59	7.4	47.2
ILLUSTRATORS	1	0	.7	8	0	4.8	10	1.3	8.0
MODALITY GO	94	8.5	64.8	59	5.4	35.8	68	8.5	54.4
SO	23	2.1	13,7	54	4.9	25.6	21	2.6	15.8
G&S	51	4.6	35.2	106	9.6	64.2	57	7.1	45.6
COMMUNICATIVE EVENT DYAD	68	6.2	40.5	174	15.8	82.5	82	10.2	61.7
GROUP	100	9.1	59.5	37	3.4	17.5	51	6.4	38.3
FORMAL	118	10.7	70.2	184	16.7	87.2	105	13.1	78.9
INFORMAL	50	4.5	29.8	27	2.5	12.8	28	3.5	21.1

Table 3

compared to 46.8 percent performed by the normals, for a slight difference of 6.4% in favour of the disordered group. A more significant difference occurs in the type or variety of gestures.

The YA produced 124 deictic gestures, that is 75.2 percent of all their nonverbal productions were deictics, with 33, or 20%, being emblems, and only 8 gestures, or 4.8%, being classified as illustrators.

Normal children showed an interesting contrast with only 54, or 37.2% of their gestures being deictics, but 90, or 62.1%, being emblems. Again, a small proportion of illustrators was observed in the normal population: only 1 illustrator, or .7%, was produced.

3.2.1.2 Modality of productions

Once again, table 3 indicates the frequency distribution for the three modes of gestures: gesture only (GO), speech only (SO) and gesture and speech (G&S), for both the YA and N groups. The value of the chi square is still high: $\chi^2(2) = 33.654$, $p < .01$. There is, most apparently, a significant relationship between the variables.

The particular distribution remains the following: the YA used 106 combinations of gestures and speech (G&S), or 64.2%, and 59 gestures only (GO), or 35.8% of their total.

The normal children contrasted greatly in their use of modality, preferring the gesture only (GO) mode, totalling 94, or 64.8%, and producing less than half the combined gesture and speech (G&S) mode: 51 or 35.2%, as compared to their aphasic age-mates.

Speech only (SO) productions were also included in the Modality variable. Although relevant to the communicative exchanges' total (total number of productions for each child), the "speech only" utterances were obviously not included in the gesture total. Again, a significant difference is observed: YA produced 54 or 25.6% speech only (SO) productions, as opposed to the 23, or 13.7%, by the normal children.

3.2.1.3 The Communicative Event

Table 3 further indicates the frequency distribution of the two components of the Communicative Event:

i) dyad versus group

ii) formal versus informal

for YA contrasted to normals.

i) Dyad versus group

The 2 x 2 table revealed the following remarkably high χ^2 value: $\chi^2(1) = 71.546$, $p < .01$. Obviously, a very strong relationship exists between the variables, as further indicated from the result of the contingency coefficient for this data: $C = .398$.

ii) Formal versus informal

The value of the χ^2 obtained is considerably lower than the value obtained for the "dyad-versus-group" component; the "formal-versus-informal" chi square = $\chi^2(1) = 16.697$, $p < .01$. Certainly an association exists between the variables, perhaps not as remarkably strong as the previous one, but nevertheless significant as further evidenced in the following contingency coefficient: $C = .205$.

It should be specified before detailing the specific results of the distribution, that the total number of productions involved in the communicative event is based on the sum of the total number of gestures produced, plus the total number of "speech only" utterances.

The total for Normal children being: Gesture total: 145 plus Speech only total: 23 = 168 Communicative Events.

The actual distribution being the following: 68/168 communicative events, or 59.5% of the exchanges were produced in a group interaction.

The majority of events were formal: (adult/child interactions) 118/168 or 70.2%, as contrasted with the 50/168 or 29.8% of the exchanges being produced in an informal exchange (child/child interaction).

The aphasic population involves the following distribution: Gesture total: 165 plus Speech only total: 54 = 219 Communicative Events.

However, eight (8) of the total 219 communicative events were observed as non-directed utterances. That is, the production, whether gesture only (GO), speech only (SO) or the combination of gesture and speech (G&S), was not directed at a particular individual in any exchange. These eight "discrepancies", which will be fully examined in the discussion that follows, cannot be included in the actual communicative events' total. Thus, the number of exchanges is reduced to 211 (219 - 8 discrepancies = 211), for the aphasic group.

A complete list of individual subjects (YA and OA) who produced the various discrepancies is found in Appendix D.

The actual distribution of the types of interaction frequencies for the YA remains the following:

174/211 or 82.5% of the communicative events were dyadic, compared with 37/211, or 17.5% produced in a group exchange. The greatest number of events were formal in nature, 184/211 or 87.2%, were produced between the aphasic subjects and adults, with only 27/211, or 12.8% being produced by the aphasic children interacting with their peers.

3.2.1.4 Data Display of Observation in a natural setting

The following bar graphs (figures 4, 5 and 6) indicate the visual representation of:

1) the YA population contrasted with their normal age mates.
2) the YA group contrasted with the OA group.

indicating: Type of gesture
Modality of gestures, and
Communicative Events.

3.2.1.5 Laterality

A qualitative measure was recorded for the hand preference of gestures used in the natural setting observation. It was hypothesized that the YA group might show mixed hand use or perhaps left hand dominance in manual communication. (based on Zangwill, 1978) Observations revealed no significant difference in right hand (RH), left hand (LH) or both hand (BH) preference, in the aphasic group contrasted to their normal age-mates. Indeed, YA used the RH for 75.2 percent of their 165 gesture total, with only 20 percent LH usage, as opposed to the normal group who produced 67.6 percent of their 145 gestures with the RH and 29.6 percent with the LH.

Figure 4

Observation - Natural Setting

Type of gestures: deictics, emblems, illustrators

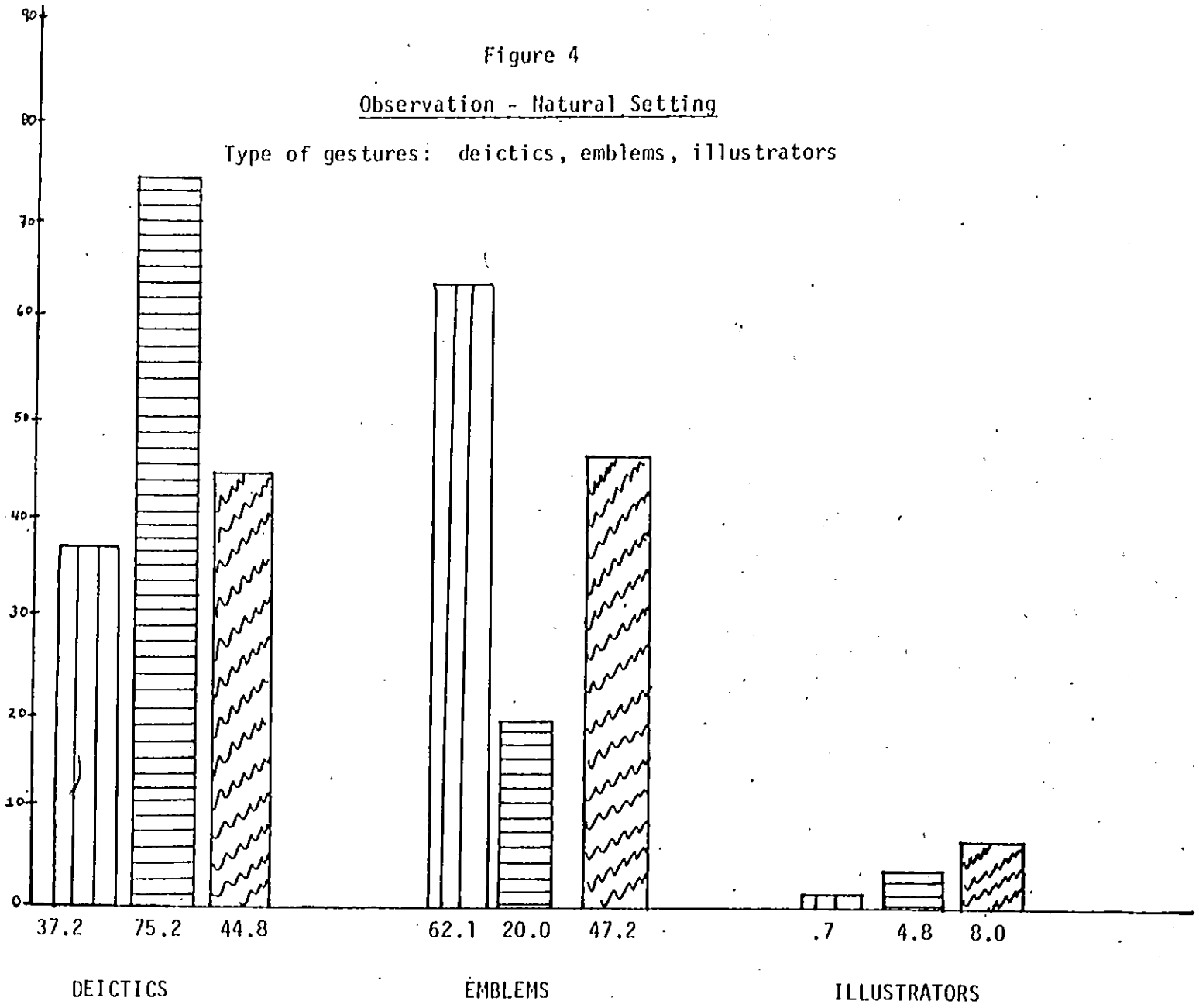


Figure 5

Observation - Natural Setting

Modality of gestures: GO SO G&S

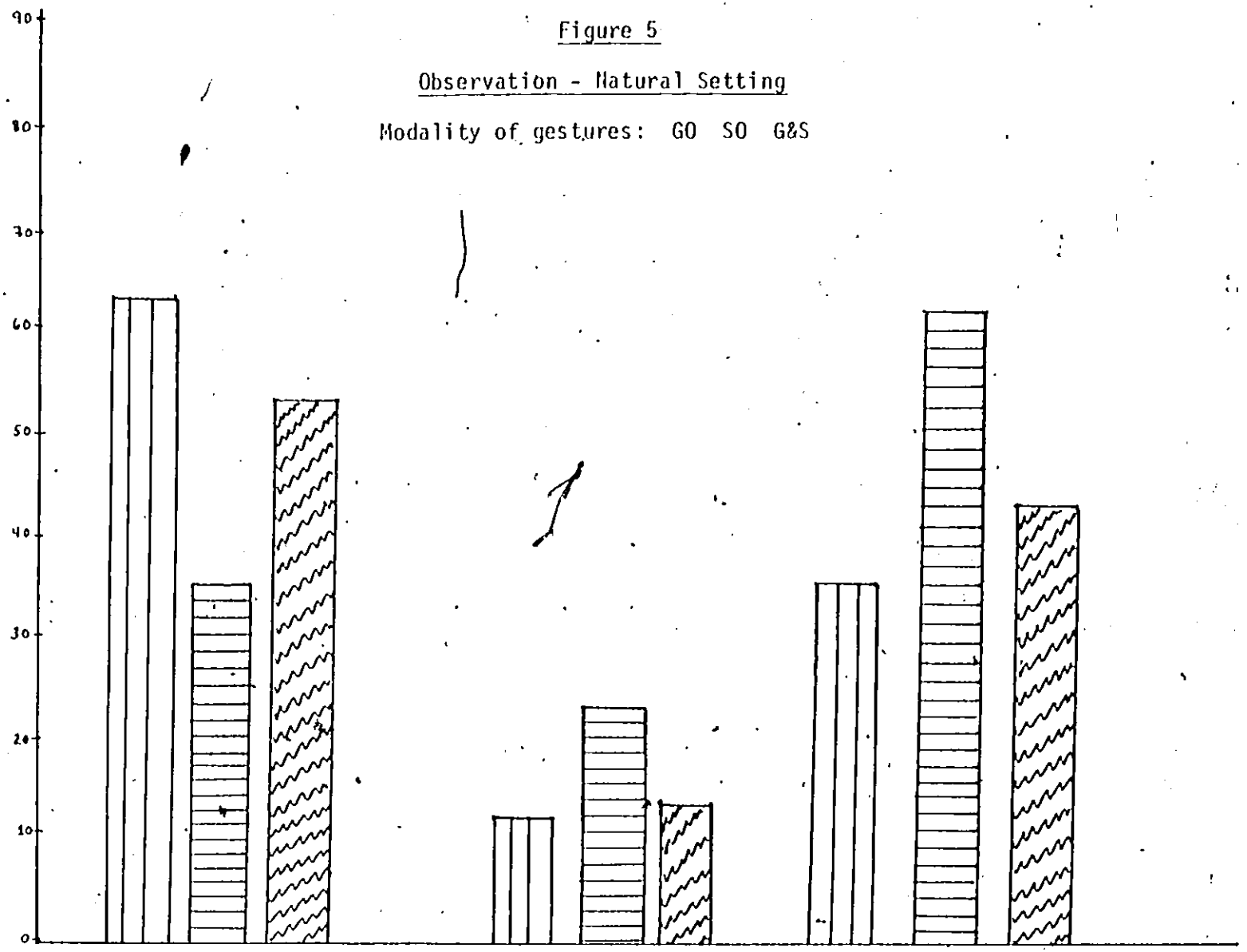
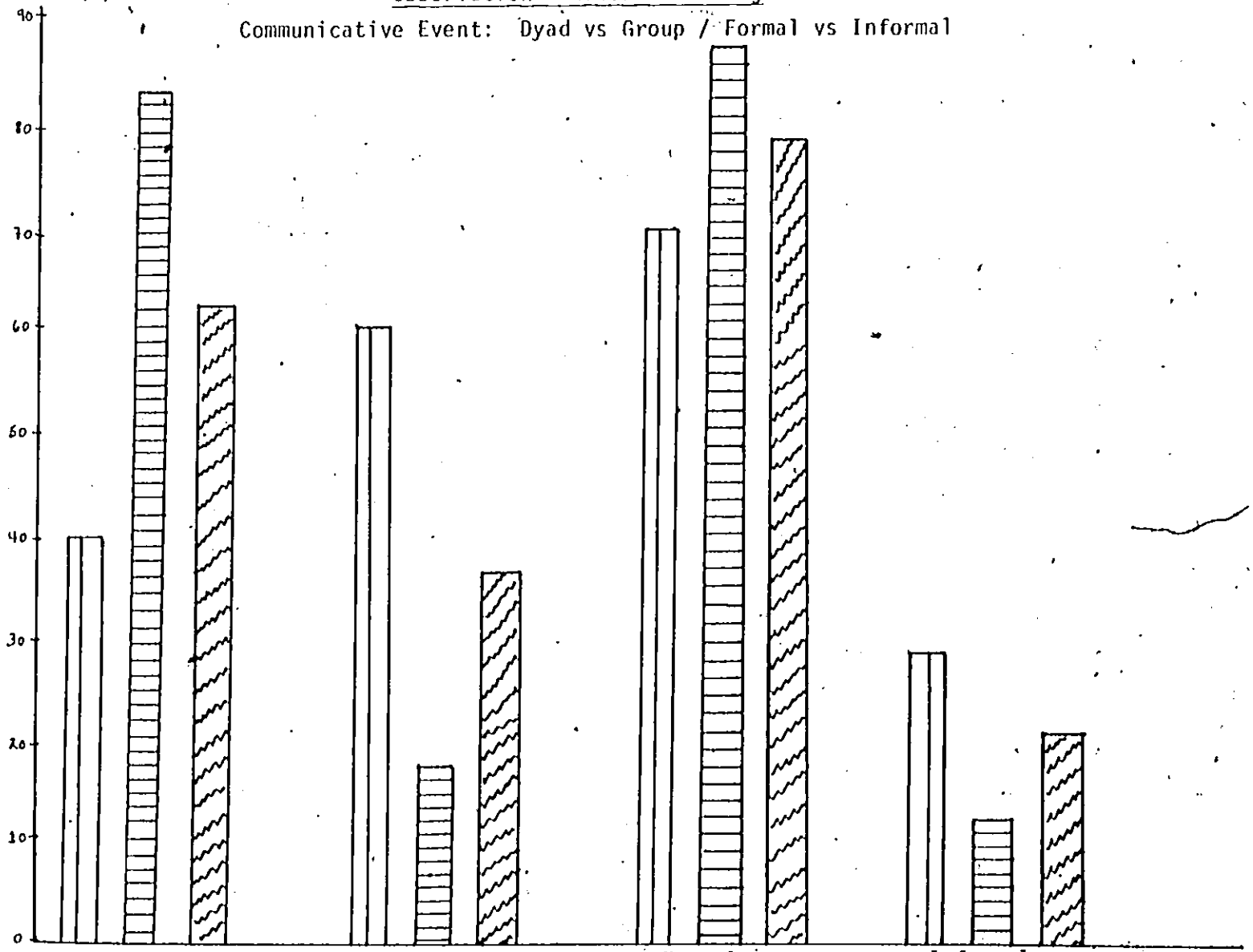


Figure 6

Observation - Natural Setting

Communicative Event: Dyad vs Group / Formal vs Informal



	Dyad	Group	Formal	Informal
Normals	40.5	59.5	70.2	29.8
YA	82.5	17.5	87.2	12.8
OA	61.7	38.3	78.9	21.1

3.2.2 Informal testing in a structured setting

The four test variables examined were the scores on the following activities:

1) the Imitation task
2) the Identification task
3) the Match Game
4) the Show Me Game

The two group variables remain:

Group 1: 11 normal children (N)

Group 2: 11 developmentally aphasic children (YA)

The analysis of variance (ANOVA) revealed significant differences between the scores for the two groups (1,2) on the following two tests:

1) Identification: $F(1,20) = 5.468$, $p < .05$

and

2) Show Me Game: $F(1,20) = 5.020$, $p < .05$

As expected, there was no significant difference between the Imitation task scores, nor the Match Game scores. For a detailed outline of the ANOVA results, see table 4.

A closer examination of individual test scores is warranted. Table 5 reveals the mean and standard deviation scores for the three groups of children. As indicated in the ANOVA across groups 1 and 2, significant score differences were obtained on the Identification task: $\bar{X}$ of 11.45 for normals, as contrasted with $\bar{X}$ of 7.6 for YA. Similarly, the scores on the Show Me Game reveal a remarkably high $\bar{X}$ of 13.45 for N, but only 10.54 for YA. The

Table 4

One-Way Analysis of Variance (ANOVA) on Informal Tasks

Normals (G1) vs Young Aphasics (G2)

TASK	F	p.
Imitation	0.588	0.4521
Identification	5.468 *	0.0299
Match Game	1.274	0.2724
Show Me	5,020 *	0.0366

Young Aphasics (G2) vs Older Aphasics (G3)

TASK	F	p
Imitation	2,290	0.1486
Identification	10.006 *	0.0057
Match Game	4.543 *	0.040
Show Me	4.806 *	0.0426

* $p. < .05$

Table 5

Scores for Informal Tests - Structured Setting

	Normals = Gp 1		Younger Aphasics Gp = 2		Older Aphasics = Gp 3	
Total Subjects	11		11		8	
$\bar{X}$ Age	6,0		6,3		9,9	
Scores	Mean/14	SD	Mean/14	SD	Mean/14	SD
Imitation Test	13.8	.40	13.6	.67	14.0	0.0
Identification Test	11.45	1.63	7.6	5.16	13.5	0.75
Match Game	12.45	1.63	11.0	3.94	14.0	0.0
Show Me Game	13.45	0.68	10.54	4.25	13.87	0.35

The Match Game scores did not differ significantly, with the Imitation activity scores showing minimal difference across groups.

3.2.2.1 Spontaneous Speech in Structured Setting

The spontaneous speech of all children, in a structured setting, was elicited either before or after the administration of the four informal tasks. The time involved for communicative exchanges with each child varied from 0 minutes (2 non-verbal, aphasic children) to 15 minutes, with an average of 6-7 minutes of interaction between the child and the examiner. The communicative event remains, then, constant across all subjects for this activity:

Dyad: Examiner and child = 2 interactants

Formal: Adult and child

Note: The Recorder did, at times, contribute a question or comment to some children.

A qualitative analysis of the spontaneous speech in the structured setting revealed the following details:

Type of gesture:

68 gestures were observed in the normal group with a mean of 6.2 per child.

The majority of gestures were illustrators: 58.8% = 40/68 with only 18/68 or, 26.5% being deictics, and the remaining 10/68 = 14.7% being emblems.

The aphasic children used 40 gestures in all, for a mean of 3.6 per child. Once again, the disordered group shows a preference for using deictics, as 18/40 or 45.0%

of all gestures observed were deictic, with 15/40, or 37.5% being illustrators, and only 7/40, or 17.5% being emblems.

Modality of production:

The normal children used 37/68 or 54.4% Gesture and Speech (G&S) combinations, and 31/68, or 45.6% in the Gesture only (GO) mode. Speech only (SO) was a smaller component, totalling 2/70 or 2.9%.

The aphasic children showed a much wider contrast in production. Once again, as observed in the spontaneous speech in a natural setting, the Gesture and Speech (G&S) combination was highest: 28/40, or 70.0% of all exchanges, with 12/40 or 30.0% as gesture only (GO), and only 1/41, or 2.4% as speech only (SO).

The speech only (SO) denominators for both groups: /70 and /41, include the total number of gestures plus the SO totals, which accounts for the difference across fractions.

3.3 Hypothesis II

Restatement of Hypothesis II:

Certain gestures/speech produced by the language-disordered children changes over time. Younger aphasic children were then contrasted to older aphasic children in the following areas:

1) Observation in a natural setting.

2) Informal testing in a structured setting, including an examination of the spontaneous speech used by the children in the formal setting.

3.3.1 Observation in a natural setting

Time frame = 30 minutes per child. The three variables examined were:

1) the frequency and variety of gestures used in the specified time framework.

2) the modality of the production: gesture only (GO)
speech only (SO)
gesture and speech (G&S)

3) the type of communicative event: i) dyad versus group
ii) informal versus formal.

Two groups of children were contrasted:

Group 2 = the younger aphasic children, ages 5-7 years.
N = 11, 10 males and 1 female

Group 3 = the older aphasic children, ages 8-11 years.
N =, 6 males and 2 females

The thirty minute natural setting observation period revealed the following:

Table 3 indicates the summary of the frequency distribution for the YA and OA as well.

3.3.1.1 Frequency and variety of gestures

Once again, the cut-off level for statistical significance will be .01 for all results, unless indicated differently. All analyses were based on frequencies outlined in Table 3.

It was hypothesized that OA would use a different quantity and quality of gestures than YA; specifically, that fewer deictics would be observed in the older language-disordered group. Chi square analysis did indicate significant differences between groups 2 and 3: χ^2 (2) = 28.166, $p < .01$, regarding the types of gestures produced.

As stated earlier, in the results of Hypothesis I, YA (N = 11) performed 165 gestures, for a mean of 15.0 per child. OA (N = 8) produced 125 gestures for a comparable mean of 15.6 gestures per child or 43.1% of the total.

Once again, a significant difference is observed in the quality or type of gestures produced: OA performed more emblems: 47.2% or 59/125, with 44.8% or 56/125 being deictics and only 8.0% or 10/125 gestures being illustrators. YA, as indicated previously, scored a remarkably high quantity of deictics: 75.2%, or 124/165, as contrasted to the 20.0% or 33/165 emblems and 4.8%, or 8/165 illustrators.

3.3.1.2 Modality of production

As illustrated in Table 3, the three modes of production include: gesture only (GO)

speech only (SO)

gesture and speech (G&S)

The Chi square value remains significantly high: χ^2 (2) = 15.923, $p < .01$.

It would appear that aphasic children seem to increase their gesture only (GO) production with age: 54.4%, or 68/125 of the manual expressions are gestures only in the OA group, as opposed to

35.8%, or 59/165 GO from the YA group. The gesture and speech (G&S) combined category occupy 45.6% of the total, or 57/125 for the OA with a higher-percentage noted in the YA at 64.2%, or 106/165.

The speech only (SO) category showed a total of 15.8%, or 21/133 for the OA group with a higher percentage in the YA at 25.6% or 54/211.

It should be noted once again that the SO fraction is based on the actual number of communicative exchanges, such that:

SO total = 21

actual CE total = 133

$\therefore$ SO = 21/133 = 15.8%

3.3.1.3. The Communicative Event

To recapitulate, the Communicative Event (CE), involves the sum of the total number of gestures produced, plus the total number of SO utterances. Such that, for the YA group:

YA = 165 (total gestures) plus 54 (SO) = 219 CE.

However, a discrepancy of 8 CE was observed, where 8 productions were non-directed and, as such, not involved in an actual communicative exchange. Such that 219 CE minus 8 discrepancies equals 211 actual CE, for the YA.

The readings for the OA group show a significant change.

OA = 125 (total gestures) plus 21 (SO) = 146 CE.

In this group, a difference of 13 was observed for an actual total of: 146 CE minus 13 discrepancies equal 133 actual CE, for the OA. Indeed, five of the eight OA produced non-directed speech and/or gestures. A complete table of the individual YA and OA and their

particular "discrepancies", is detailed in Appendix D.

More specifically, the CE division comprises two subgroups:

i) dyad versus group

ii) formal versus informal.

1) Dyad versus group

χ^2 testing revealed the following significant differences: $\chi^2(1) = 18.61$, $p < .01$. The variables are not independent, as further eyidenced by the contingency coefficient result: C = .226

Specifically, the OA produced 61.7% or 82/133 events in dyadic encounters with only 38.3%, or 51/133 in a group interaction.

The YA showed a noticeable difference: a high percentage, 82.5%, or 174/211 of the exchanges were produced in a dyad as opposed to 17.5%, or 37/211 in a group.

2) Formal versus Informal

The value of the χ^2 obtained in the formal vs informal table is considerably lower than all the others: $\chi^2(1) = 4.093$, $p < .05$ Although just above the critical value, results indicate that a relationship does exist between the variables, as indicated in the contingency coefficient result: C = .108

It would seem that OA prefer the formal exchange: adult/peer, at 78.9% , to the informal exchange: child/child at 21.1%, but significantly less so than their younger counterparts. Indeed, the YA produced a high 87.2% of their exchanges in a formal encounter and only 12,8%, in an informal interaction.

3.3.1.4. Data Display

As outlined in section 3.2.1.4., the bar graphs, (figures 4, 5 and 6) visually represent the above statistics. The differences between the three groups: N, YA and OA are observed for the observations in a natural setting.

3.3.1.5. Laterality

Once again, a qualitative analysis was obtained for the gestural hand preference between YA and OA. In the OA group, a significant decrease is observed in the use of the right hand, which, nevertheless, remains the dominant hand for gestural use in most OA: 63.2% of the gestures were produced with the RH; 32,8% were produced with the LH, and only 4.0% were produced with both hands, as opposed to 75.2% RH use and 20.0% LH use for the YA group.

3.3.2 Informal testing in a structured setting

The four test variables examined were, once again, the scores on the four informal tasks.

The two group variables remain:

Group 2: 11 younger aphasics (YA), ages 5-7 years

Group 3: 8 older aphasics (OA), ages 8-11 years.

The analysis of variance (ANOVA) revealed significant differences for three out of the four tests' scores for the two groups (2,3):

1) Identification: $F(1,17) = 10.006$, $p < .05$

2) Match Game : $F(1,17) = 4.543$, $p < .05$

3) Show me Game : $F(1,17) = 4.806$, $p < .05$

Interestingly, no significant differences were observed on the Imitation task (see table 4, for a complete listing of ANOVA results for groups 2&3)

Table 5 outlines the individual $\bar{X}$ scores and SD for groups 2 and 3, for all informal tasks. OA scored remarkably well across all activities with all four $\bar{X}$ scores at 13.5 or higher. YA did significantly poorer on the Identification task, with a $\bar{X}$ of 7.6, followed by the "Show Me Game" $\bar{X}$ score of 10.54, and the "Match Game" $\bar{X}$ of 11.0 Once again, the Imitation Task proved no problem for any of the subjects: YA scored a 13.6 $\bar{X}$, and OA, a perfect 14.0

3.3.2.1. Spontaneous Speech in a structured setting

A qualitative analysis of the spontaneous speech of both the YA and OA groups was examined.

As in Hypothesis I, discourse was encouraged with all children before or after testing and involved approximately 4-5 minutes with each child. The type of communicative event remains constant across all exchanges:

1) dyadic: Examiner/child exchanges
2) formal: Adult/child encounters

The Recorder did, at times, contribute to the interactions.

Analysis of the spontaneous speech produced by the YA and OA groups revealed the following:

34 gestures were observed in the OA group, for a $\bar{X}$ of 9.9 OA used considerably more illustrators and emblems than their younger counterparts. 64.7% of the gestures were illustrators, and 26.5% were emblems, as opposed to only 8.8% being deictics.

YA produced 40 gestures in all, for a $\bar{X}$ of 3.6, but showed a preference for deictics: 45.0%, with only 17.5% as emblems and 37.5%, as illustators.

Modality of production:

OA used 79.4% gesture and speech combinations, and only 20.6% GO productions. The SO mode was not used in this particular setting by the group.

YA showed a similar preference for the combinatory gestural and speech mode (G&S), producing 70.0%, and 30.0% in the GO mode.

3.3.2.2. Parent/Teacher Report Data

The nine-item questionnaire focused on the following main areas: 1) use of hands and arms for communicative purposes.

2) play preference of child: alone or with others.

3) the ability to perform another task while communicating.

The number of subjects = 30 children

The number of questionnaires returned by teachers = 30 = 100%

The number of questionnaires returned by parents = 21 = 70%

The seven teachers reported the following:

All normal and YA children used their hands and arms to facilitate communication, whereas 87.5% of the OA used frequent gestural expressions. All normal children were judged capable of handling a separate task while speaking/communicating, with only 72.7% of the YA and 75.0% of the OA capable of handling two simultaneous activities. Although only 9.1% of the normals were believed to prefer playing alone, 62.5% of the YA, and 37.5% of the OA were judged as prefering to play on their own.

The parents' information revealed quite similar results: From the parents' perspective, all normal and OA children used hands and arms to communicate, with 85.7% of the YA group using gestures.

Similarly, all normal and OA children were thought capable of performing separate tasks while communicating, with 85.7% of YA capable of handling simultaneous activities. Of the OA group, 37.5% were thought to prefer playing alone with only 14.3% of the YA showing the same preference, whereas none of the normal children were believed to prefer solitary play.

The vast array of results indicates significant differences across the three groups of children. YA certainly differed from their normal counterparts, and the OA group showed considerable improvement. The "particulars" of the data will be discussed in the following chapter.

Chapter IV: Discussion

This chapter will attempt to explore the meaning behind the results obtained in both sections of the research. That is, discussion of the results will revolve around the following principle divisions:

1) Observations in a natural setting, outlining the contrast between:
   i) young aphasics and their normal age-mates (Hypothesis I)
   ii) young aphasics and older aphasic children (Hypothesis II)

2) Results of the informal testing in a structured setting, contrasting once again:
   i) the young aphasic group and their normal counterparts (Hypothesis I)
   ii) young aphasic children with older aphasic children (Hypothesis II)

A final section of the chapter will include the examination of a theoretical concept: the production of non-directed speech and gestures by the aphasic group, and the possibilities for further exploratory research.

Before proceeding with the interpretation of the results, it should be noted that the very high level of agreement between the Examiner and judges is a clear measure of the relative objectivity and reliability of the scores obtained.

4.1 Observation in a Natural Setting

Chi square analyses certainly demonstrated a significant difference between the groups: (1,2) (2,3), regarding type and frequency of gestures produced in a natural setting.

The YA used considerably more gestures in the natural setting exchanges than their normal counterparts. The significant difference, however, is not so much in the quantity of gestures produced, but in their quality, or type. Frequency totals (table 3), as evidenced by the χ^2 values, indicate that early arriving deictics, the "pointing gestures", predominate the YA's choice of manual expression. On the other hand, the more complex, later arriving emblems, such as "come here", "I don't know", form the largest group of gestures for the normal children. The findings were largely expected for both groups, assuming the hypothesis that language-disordered children process similar patterns of language development, but at a slower rate than normal age-mates. (Morehead and Ingram, 1973). Later, the contrast between the YA and OA will further strengthen the delayed acquisition theory.

Illustrators, the third type of gesture, which tend to increase with age and verbal complexity in normals, were not as frequent. The total of 8 illustrators for the YA group warrants further explanation. One child (M.S., age 6,4) repeatedly used the "shape" illustrator, to indicate the size of a box; the perseverative gesture was used 6 times during the half hour observation period, and as such, inflated the "illustrator" score for the entire YA group. In general, the YA group could process and produce only three basic shapes: circle, square and triangle. Spontaneously, the YA children appeared "locked into" a constant use of deictics throughout all communicative exchanges. That is, demonstrative adjectives and adverbs: this, that; here,there, were present in most conversations. Even the two nonverbal children (C.L., age 6,4 and P.L., age 5,7) use GO deictics in most interactions. Usually, deictics are produced in a combinatory mode, such that the gesture is accompanied by speech, which accounts for the significant number of G&S productions in the YA, as opposed to the normals. Perhaps YA tend to "lock into" deictics for obvious reasons:

1) ease of production
2) high visibility and frequent use in spontaneous productions
3) often used as an instructional tool in questioning the child, or directing his focus: "What is that?"
   "Put your coat there/here".

The YA group then "lock into" a frequently used pattern, where even the child's intonation and rhythm is identical to that of the teacher. The YA do seem, however, to be capable of breaking away from this "instructional" level of language use.

The aphasic group certainly demonstrate significant linguistic progress over time. OA children perform a greater balance of gesture types as indicated in the frequency chart (see table 3) of gestures produced in natural settings. This far more equal distribution of gestures is further evidenced in the choice of modality by the OA, where gesture only (GO) productions are somewhat more frequent than G&S combinations. It would appear then, that the OA group seem to be able to implement a wider variety of gesture types and modes, just as the normal younger group. Chi square analyses between OA and YA reveal a positive, significant difference regarding the distribution of gestures in natural settings.

In most communicative events, both YA and OA groups felt more comfortable in a formal, dyadic encounter, that is, communicating with the teacher or aide, on a one-to-one basis. Although all classes for the aphasic children involve group activities, language tends to increase in the formal, dyadic exchange. During group tasks: news sharing, play-time, the YA will rarely initiate any communicative interaction. Interestingly, some of the higher functioning aphasic children will raise their hand for attention, but often in error, or, when called upon to respond, the child will forget the reason for raising his hand. This routine of hand raising for attention contrasts markedly with the normal children, who largely appear "over-eager" to contribute news or information to their classmates and teachers.

Indeed, young normal children prefer group encounters to dyads in interactive contexts, as evidenced by the χ^2 analyses. This preference for "group encounters" was also highlighted in the reports from the

Parent/Teacher Questionnaire. Both the parents and the teachers believed that the majority of normal children and OA preferred playing/interacting with others or in small groups, than by themselves. This contrasts significantly with the YA group, the majority of whom were believed to prefer playing alone rather than with others.

4.2. Informal Testing in a Structured Setting.

Analyses of variance (ANOVA) revealed significant differences in comparing the scores on the informal tests, across the three groups. However, all children did remarkably well on the Imitation Task, with no significant differences between the groups (1,2) (2,3), the lowest mean for all 30 subjects being 13.6. It should ne noted that the educational program for the aphasic children involves a considerable amount of repetitive, imitative behavior. For example, if the aphasic child does not understand a request made by the teacher, such as hanging up his jacket on the proper hook, the child is literally walked through the entire routine, the teacher actually guiding the child's hands and arms.

The specific tests which showed significant differences in scores for both groups (1,2) and (2,3), include: the Imitation task and Show Me Game, as well as the Match Game, where only the YA and OA differed significantly.

YA had considerable difficulty with the Identification task. Certainly, the zero scores from the nonverbal children affected the average. OA did very well on the same activity, performing better than the younger normals. This result was not surprising (although the generally high scores for OA on all activities did surprise the Examiner).

By the mean age of 9,9 , the OA group should have fully processed all prominent deictics and emblems and be fairly effective in their use. Although the YA group did not differ significantly with normals on the Match Game, they did when contrasted to the OA group, the latter achieving perfect scores across all 8 subjects. The Show Me task, as stated earlier, showed significant differences across both groups (1,2) and (2,3), with the OA achieving the highest scores for the three groups. It would seem that considerable progress is observed in the meaningful comprehension and production of gestures, as aphasic children develop. Indeed, the dichotomy between YA and OA scores prove interesting. All OA children felt very comfortable during the tasks and produced direct, no-hesitation answers. Two of the OA commented on the simplicity of the tasks (D.D. and C.W.). It would appear that OA can accurately process and produce these early deictics, emblems and illustrators. However, appropriate use of the various gestures in different contexts is often incorrect. Verbal and gestural miscues are frequently observed in various communicative exchanges. In other words, the aphasic child knows, or is capable of learning a considerable portion of the "what" of his language, but often has difficulty with the "how". Such that the formal structure may be technically correct, but the production is non-directed or out-of-context. The aphasic child remains then, greatly restricted in his language use.

Certainly the discussion of the results remains hypothetical, indicating a need for additional research into particular problems of actual language use by language-disordered populations.

4.3. "Discrepancies: The Non-Directed Productions."

One noticeable area of contrast between the three groups: normals, YA and OA, proves to be in the nature, or description of the communicative exchange, as observed in natural setting exchanges. The use of non-directed, verbal and gestural productions by the aphasic groups remains a very interesting phenomenon.

As outlined in the preceding chapter, YA and OA produced a variety of "discrepancies", or non-directed performatives. Indeed, arbitrary verbal and gestural utterances are used by several aphasic children. Questions are asked, comments with accompanying gestures are produced, but not directed at any individual in particular. Four of the eleven YA produced non-directed language during the observational period. It is interesting to note that, as the child ages, the tendency to increase these arbitrary, linguistic "discrepancies", augments. Indeed, five of the eight OA produced a variety of discrepancies, as detailed in Appendix D.

Certainly, younger normal children tend to use non-directed or "private speech" as well. Bates et al (1983), suggests that as early as 13 months, when the young child begins to label items, words are used inside and outside of a communicative framework. That is, young children frequently label things to themselves, without eye contact, without searching for feedback from another. From a theoretical framework, both Piaget (1962) and Vygotsky (1962), have given equal weight to the non-communicative function of symbols in the child' construction of reality.

With age, however, the pattern of "private speech", changes

considerably. Vygotsky referred to this phenomenon as "tool thought", a form of speech which accompanies action, "ordering behaviors into planned events". At the same time that this "outer speech" starts to guide action, it also decreases, to eventually disappear, or transform itself into what is generally called "inner speech", the so-called foundation of rational thought. The transition from outer to inner speech is a subtle one, cognitive and social factors contributing to the internalizing of speech. Indeed, we do not encourage our five and six-year old children to "think out loud". Social structure, certainly in terms of educational settings, discourages seemingly arbitrary, non-directed linguistic productions. Cognitively and socially, the normal 5-6 year old can process and plan various learning strategies and adapts relatively well to new routines and procedures. The story of the language-disordered child is an entirely different picture.

In chapter one, we examined the difference between code usage in various interactions, (Bernstein, 1966). A distinctive difference was observed between the highly contextual, restricted code and the rather explicit nature of the elaborated code. Aphasic children demonstrate interesting use of a very restricted code. Indeed, the aphasic child appears to assume a great deal of knowledge on the part of the interactants involved in his communicative exchange. The content of the aphasic child's exchanges are highly implicit, almost programmed in nature, emphasizing a considerable portion of presupposed, shared knowledge. The child rarely initiates the interaction. However, as age increases, aphasic children show a significant increase in general linguistic ability.

Interestingly, this same "programmed" quality to their language seems to remain. Older aphasic children can be just as "off-target" in their communication. The formal properties of language may progress noticeably, but it would appear that language use, particularly, remains rather "hap-hazard" or somewhat arbitrary. Certainly a great many non-directed productions are observed. Such gestural and verbal performatives include:

PRODUCTION		SETTING
"I'll put that there."	I.G.,	using G&S, in attempting to paste pictures on paper.
"Go over there."	G.T.,	using SO, uttered while moving across the room.
"I guess I'll do it by ones."	J.W.	using G&S, finishing a math exercise.

Initially, it appeared as though the children were merely echoing directions. Closer attention to the "discrepancies" revealed that these particular gestures and speech, accompanied a specific motor task or activity: whether pasting pictures, organizing their desk work or walking across the room. It can be hypothesized then, that certain aphasic children seem to need the extra modality of the verbal and/or gestural expression to express intention or purpose. This particular

device, for it appears to take on the cloak of some organizing/performance strategy, is observed across all ages: in the 5-year old aphasic child, in the 7-year old and with increased usage in the 10 and 11 year olds.

Just as the younger, normal child needs to organize and categorize his reality, the language-disordered child may adopt an "outer speech" technique to sort and plan his routine. The normal child is socially aware of his language and its capacity to alter the receiver's actions and beliefs. The language-disordered child, however, seems unable to disambiguate such social/linguistic distinctions, and, perhaps, never transcends the stage of "outer speech". His "tool thought", being a fundamental coping strategy, to sort, organize and focus on reality.

At this stage, the above discussion is certainly hypothetical. Much more in-depth examinations of individual aphasic children's use of "outer speech", in a variety of settings, is warranted. The first problem which arises is determining if several groups of language-disordered children produce similar "discrepancies". Since all aphasic children in this research are involved in a very structured language/educational program, it would be interesting to determine if the non-directed productions are a type of acquired behavior, particular to this group. Certainly, extensive analyses of the child's gestures and speech at home and in a variety of contexts, outside the school, would also be helpful.

Chapter V: Summary and Conclusion

5.1 Summary

For a complete picture of the child's linguistic ability, both the formal and functional properties of language must be examined. This research attempted to explore one particular aspect of the functional aspect of language development: the use of gestures that accompany speech in certain contexts.

The concept of context necessarily involves the knowledge of pragmatics: the actual rules of language use in particular situations or events. Indeed, language use is greatly dependent on a variety of social and linguistic variables, notably: type of communicative event, whether formal or informal; number of participants involved, whether dyadic or group exchanges; type of modality preferred: graphic, oral or gestural modes, and certainly, the relationships between the interactants. Until quite recently, the gestural mode of language had been greatly overlooked, and indeed, undervalued in developmental studies. In fact, gestures are now seen as a highly significant component of our communication system, readily observable (even from a very early age), and occurring naturally and frequently in the course of conversations.

As such, the use of fourteen prominent gestures was examined in children with a wide variety of linguistic abilities. The gestures were grouped according to age of acquisition: deictics, the pointing gestures; emblems, gestures that act like words and stand on their own, and illustrators, the manual expressions that amplify or clarify the spoken message.

It was determined through previous language studies (Poon and Butler, 1972; Bates, 1976a; Rom and Bliss, 1983) that comparisons between normal language populations and disordered groups would prove beneficial to the general developmental question. The examination of the type and quality of linguistic productions in a deviant group can often enlighten the question of development and function of normal processes. The research concentrated, then, on two specific areas: the examination of gestures produced by developmentally aphasic children, contrasted with the gestural use of their normal age-mates, and the further examination of the possible changes in gesture types over time, that is, comparing the gestural production of young aphasic children with older aphasic children. To achieve these purposes, two principle procedures of data collection were implemented: observation of speech/gestures in a natural setting and the presentation of a series of four gestural comprehension/production tasks to each child.

Statistical analysis revealed significant differences across the groups. In the observational period, younger aphasics (YA) produced a large portion of early arriving deictic gestures and strongly favoured a dyadic exchange. Normal children, on the other hand, showed a preference for emblems in natural setting exchanges and enjoyed, even preferred small group exchanges over dyads. Older aphasic children (OA) demonstrated a high degree of gestural versatility, employing a variety of types and modes of linguistic productions. Similarly, the results of the informal tasks in a structured setting revealed that YA did significantly poorer on two activities as opposed

to normals, and contrasted even more markedly with the older disordered group. Indeed, OA scored very high across all four activities, indicating positive developmental change in terms of gestural comprehension and production. However, the rather unique and unexpected occurrence of certain non-directed productions proved of interest. It would seem that most aphasic children produce a certain quantity of "discrepancies" in their language production. Specific parameters surrounding the phenomemon are conjectural at this point, but may prove a further step into the language processing question generally. Further study of the use of gestures in a variety of populations would prove valuable in the growing field of developmental pragmatics.

5.2 Conclusion

Through active participation in a variety of social and linguistic events, the child generally broadens his knowledge. Knowledge of his world and how it functions, and how he, as a participant, can affect change in some capacity. Through language, the child is provided with an invaluable tool which he may select to produce that change. Language can organize his world, classifying and labelling the components. Language allows the child to reflect on, and contribute ideas, opinions and feelings, to a variety of people for a variety of purposes. The task of communicating and exchanging this vast array of knowledge appears monumental. The fine tuning devices used in the linguistic process seem intricate and complex. And yet language remains one of the most natural and spontaneous activities. Problems in the communicative network may however develop in any one, or a combination, of the links of the system.

Specifically, this research explored the particular use of the gestural system in normal and language-disordered children. The experience proved revealing in many ways -- a stepping stone for much needed research. As Cicone et al. (1979, 325) conclude: "... a study of the role of gesture in communication serves as a reasonable starting point in a consideration of the pragmatics of aphasic communication." It should be noted, however, that the findings reported here should be regarded as preliminary and tentative, for three particular reasons:

1) given the exploratory nature of the inquiry
2) the relatively small and select size of the sample
3) the possibility of individual variation when considering this specific language-disordered population.

However, the array of descriptive and quantitative information does provide significant baseline data for further research. The question of language inquiry proving a constant source of challenge and interest.

Appendix A

Description of Gestures used in the Research:

1. HERE/THIS: pointing, generally with the index finger extended and indicating a specific referent in close proximity to the encoder.

2. THERE/THAT: pointing, generally with the index finger extended, and often with full arm extension as well, and indicating a specific referent away from the encoder.

3. YOU: pointing, generally with the index finger and arm partially or fully extended and indicating a specific person involved in the interaction with the encoder.

4. ME/I: pointing, generally with the index finger and arm bent to the chest, indicating specifically the speaker/encoder, himself.

5. COME HERE: motioning inward, generally with the index finger or full hand, to move nearer/closer to the encoder.

6. BE QUIET: bringing the index finger, generally, vertically to the mouth, and usually accompanied by a vocalization, [ʃ] , or lip movements.

7. GO AWAY: "the ridding gesture" - generally a side or frontal sweep of the open hand and bent arm, motioning away (both hands and arms may be used simultaneously).

8. NUMBER (HOW MANY): the indication of quantity or amount, by the vertical extension of the fingers (ten and under) - palms are generally facing out, except when child is counting to himself.

9. I DON'T KNOW: generally the use of both open hands and arms, bent at the elbows, palms up and facing out, and generally accompanied by a shoulder shrug.

10. GOODBYE: generally a wave of the full hand or fingers.

11. HI: generally a wave of the full hand or fingers.

12. RAISED HAND FOR ATTENTION: hand and arm are either fully or partially extended in upright vertical motion - may be accompanied by simultaneous hand wave.

13. HOW BIG (SIZE): the use of both hands or one hand, fingers extended or bent to illustrate length, width, height...

14. SHAPE (ROUND, SQUARE...): the use of both hands or one hand to illustrate circles, squares, triangles...

Appendix B(i)

NAME _____ AGE _____ SCHOOL _____

TEST Imitation Task DATE _____

	LATERALITY			PRODUCTION		
GESTURES	RH	LH	BH	ADEQ.	PAR.AD	INAD.
Pre-test Item						
Pre-test Item						
- HERE/THIS						
THERE/THAT						
YOU						
ME/I						
COME HERE						
BE QUIET						
GO AWAY						
NUMBER (HOW MANY)						
I DON'T KNOW						
GOODBYE						
HI						
RAISED HAND FOR ATTENTION						
HOW BIG (SIZE)						
SHAPE (ROUND, SQUARE)						
COMMENTS						

Where RH= Right Hand, LH= Left Hand, BH= Both Hands.

ADEQ.= Adequate, PAR AD.= Partially Adequate, INAD.= Inadequate.

Appendix B(ii)

NAME _____ AGE _____ SCHOOL _____

TEST Identification Task DATE _____

	IDENTIFICATION		
GESTURES	Can	Can-not	Comments
Pre-test Item			
Pre-test Item			
HERE/THIS			
THERE/THAT			
YOU			
ME/I			
COME HERE			
BE QUIET			
GO AWAY			
NUMBER (HOW MANY)			
I DON'T KNOW			
GOODBYE			
HI			
RAISED HAND FOR ATTENTION			
HOW BIG (SIZE)			
SHAPE (ROUND, SQUARE)			

COMMENTS _____

NAME_____ AGE_____ SCHOOL_____

TEST The Match Game DATE_____

	ASSOCIATION		
GESTURES	Can	Can-not	Comments
~~Pre-test Item~~			
Pre-test Item			
HERE/THIS			
THERE/THAT			
YOU			
ME/I			
COME HERE			
BE QUIET			
GO AWAY			
NUMBER (HOW MANY)			
I DON'T KNOW			
GOODBYE			
HI			
RAISED HAND FOR ATTENTION			
HOW BIG (SIZE)			
SHAPE (ROUND, SQUARE)			

COMMENTS_____

APPENDIX B(iv)

Appendix B(v)

NAME_____ AGE_____ SCHOOL_____

TEST The "Show Me" Game DATE_____

	LATERALITY			MODALITY			IDENTIFY		COMMENTS
GESTURES	RH	LH	BH	GO	SO	G+S	CAN	CAN-NOT	
Pre-test Item									
Pre-test Item									
HERE/THIS									
THERE/THAT									
YOU									
ME/I									
COME HERE									
BE QUIET									
GO AWAY									
NUMBER (HOW MANY)									
I DON'T KNOW									
GOODBYE									
HI									
RAISED HAND FOR ATTENTION									
HOW BIG (SIZE)									
SHAPE (ROUND, SQUARE)									
COMMENTS_____									

Where RH= Right Hand, LH= Left Hand, BH= Both Hands.

GO= Gesture Only, SO= Speech Only, G+S= Gesture+Speech

Appendix B(vi)

NAME_____ AGE_____ SCHOOL_____

TEST Spontaneous Speech DATE_____

	LATERALITY			MODALITY			COMMENTS
GESTURES	RH	LH	BH	GO	SO	G+S	
Pre-test Item							
Pre-test Item							
HERE/THIS							
THERE/THAT							
YOU							
ME/I							
COME HERE							
BE QUIET							
GO AWAY							
NUMBER (HOW MANY)							
I DON'T KNOW							
GOODBYE							
HI							
RAISED HAND FOR ATTENTION							
HOW BIG (SIZE)							
SHAPE (ROUND, SQUARE)							
COMMENTS_____							

Where RH= Right Hand, LH= Left Hand, BH= Both Hands.

GO= Gesture Only, SO= Speech Only, G+S= Gesture+Speech.

PARENT/TEACHER QUESTIONNAIRE

Appendix B(vii)

CHILD'S NAME_____ AGE_____

SCHOOL _____ TEACHER_____

PLEASE CHECK ✓ THE FOLLOWING.

1- Does the child use his/her hands and arms when talking or trying to communicate?

sometimes ____ never ____ always ____

2- Does the child look at the person he/she is communicating with, i.e. does the child watch the hearer's face?

sometimes ____ always ____ never ____

3- Can the child answer a speaker while doing something else, like playing?

never ____ sometimes ____ always ____

4- Can the child do another activity while talking?

always ____ never ____ sometimes ____

5- Does the child generally play alone?

never ____ always ____ sometimes ____

6- Does the child play better:

alone ____ with 1-2 others ____ in groups ____

7- When the child wants something, does he/she:

point and ask ____ point only ____ ask only ____

8- When using his/her hands, the child uses mostly:

the right hand ____ the left hand ____

9- When the child is talking, have you noticed that the child uses his/her hands, arms and fingers:

a lot ____ very little ____ haven't noticed ____

COMMENTS:_____

_____

Appendix C

Grouped according to classroom division:

Younger Aphasics (YA)			Older Aphasics (OA)			Normals		
Name	Sex	Age	Name	Sex	Age	Name	Sex	Age
P.L.	M	5,7	J.W.	M	9,9	A.L.	M	6,5
L.K.	M	5,3	S.W.	M	8,9	N.W.	F	6,4
M.K.	M	5,3	J.L.	M	8,8	S.R.	M	5,7
R.F.	M	5,3						
C.L.	F	6,4						
G.T.	M	7,9	D.D.	M	8,10	R.M.	M	5,5
B.M.	M	6,5	C.B.	F	10,2	D.L.	M	5,0
M.S.	M	6,4	S.W.	F	10,5	D.F.	M	5,0
K.H.	M	5,7	J.R.	M	11,3	D.Y.	M	5,4
			M.K.	M	11,8			
I.G.	M	6,9				S.L.	M	7,0
R.G.	M	7,9				M.G.	M	7,0
						A.O.	M	6,9
						J.J.	M	6,5
Total: 11 S_s	10 M 1 F	$\bar{X}$ age = 6,3	8 S_s	6M 2F	$\bar{X}$ age = 9,9	11 S_s	10 M 1 F	$\bar{X}$ age = 6,0

APPENDIX D

Discrepancies in Communicative Events

involving: Younger Aphasics (YA)
Older Aphasics (OA)

Activity: Observation, natural setting (30 minute period)

Discrepancy: defined as the production of a non-communicative gesture only (GO), speech only (SO) or, gesture-speech combination (G&S), not directed to anyone in particular, or directed toward self.

Children who produced non-directed speech and/or gestures:

Child	Age	Discrepancy total	Type of Discrepancy		
			GO	SO	G&S
G.T.	7,9	2	1		1
M.S.	6,4	2	1		1
I.G.	6,9	3			3
R.G.	7.9	1			1
S.W.	8,9	2			2
J.L.	8,8	1	1		
S.W.	10,5	4	2	1	1
J.R.	11,3	3	2		1
M.K.	11,8	3	2	1	

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