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THE DEVELOPMENT OF PRONOUN USAGE AMONG PSYCHOTIC CHILDREN AND ITS RELATION TO THREE COGNITIVE-LINGUISTIC SKILLS.
THE OHIO STATE UNIVERSITY, PH.D., 1979

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THE DEVELOPMENT OF PRONOUN USAGE AMONG
PSYCHOTIC CHILDREN AND ITS RELATION TO
THREE COGNITIVE-LINGUISTIC SKILLS

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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* * * * *

The Ohio State University
1979

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I would like to thank the professors who have guided me and supported me during my years at Ohio State University—Dr. H. Angelino, Dr. C. Wenar, Dr. H. Leland. Specifically, I am grateful to Dr. G. Winer for his continuous support of my research interests and concern with my professional development.
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In the beginning is the relation...
The basic words I—You can only be spoken with one's whole being... I require a You to become; becoming I, I say You.

Martin Buber
I

INTRODUCTION

Among the many miracles that occur when a child develops language is the facility with which he learns to use the personal pronouns I and you. There are many reasons we might expect these pronouns to be difficult to learn. Most importantly, the pronouns I and you do not have clearly stable referents. The referent changes depending on the speaker, and the child must grasp this reversible quality in order to use these words correctly. In addition, unlike the simple nouns in children's early speech, these pronouns demand linguistic transformations to denote case (I becomes me). It is perhaps surprising that so few errors are made.

In contrast to normal children, one of the striking characteristics of the psychotic child's disturbed speech is the confusion he expresses in an attempt to use these pronouns. The psychotic child's emotional aloofness is often dramatically illustrated by his inability to identify correctly another as you and himself as I. This confusion in the use of pronouns was first described by Kanner in 1943 when he distinguished the syndrome of
early infantile autism from the general category of childhood schizophrenia. According to Kanner, one of the chief characteristics of this syndrome was pronoun reversal, the substitution of you for I. For example, an autistic child may express his desire for food by saying "You want to eat now." Others have noted that the autistic child may substitute he or a proper name for the first person pronoun (Bosch, 1962, 1970; Fay, 1971), or avoid the word I completely (Bettelheim, 1969). Norman (1954) claims that the autistic child may use the developmentally advanced passive tense "this package has been wrapped" to avoid the use of the first person pronoun. Similar difficulties in pronoun use—pronoun reversal, substitution, or avoidance—have been found in schizophrenic children (Shapiro, Fish, & Ginsberg, 1972), a varied group of psychotic children (Weiland & Legg, 1965), symbiotic children (Bergman, 1971), and adolescent autistic children (Simmons & Baltaxe, 1975).

If these observations are accurate, they imply a distortion in the developmental process of language acquisition among these disturbed children.¹ In order

¹For the purpose of this discussion of language, the terms autistic, schizophrenic and psychotic will be considered descriptions of the same population of disturbed language-delayed children. A further discussion of diagnosis is found on page 59.
to evaluate what the nature of such a distortion might be, it is important to examine the development of pronouns among normal children.

**Normal Pronoun Development**

Unfortunately, there is very little information on the development of pronouns among normal children. Goodenough (1938) and Young (1942) saw the development of pronouns as an important indicator of emerging self-awareness. By counting the frequency of pronouns used in the speech of children from 1-3, these early researchers established norms for the emergence of various pronouns. The younger children use a high percentage of neuter pronouns such as *it* and *that*. The first personal pronouns used are first person possessives—*my* and *mine*. At two, the child uses *I* consistently, and then begins to use *you*. The third person pronouns *he* and *she* are the latest to develop and are rarely used before age 2½, according to these early researchers. More recent studies have substantiated this order of pronoun development. Huxley (1970) concludes that *my* and *mine* emerge before *I*, and that they are often used in the nominal position "my want to go." Lee (1974) confirms that neuter pronouns and first and second person pronouns emerge before third person pronouns. Nelson (1975) found that the pronoun *I* is used more frequently than *you* or *he/she* in early speech, and concludes
that the use of the first person pronoun develops earliest.

It is unclear what the reasons are for this particular sequence of pronoun development—from my and mine to I, you, and then he. Basing their theories on a simplistic interpretation of Piaget, the earlier researchers attributed pronoun development to the young child's egocentrism. At first, the child uses language to express personal desires and needs, and the pronoun I is important. As he becomes less egocentric, his language expands to include those he relates to directly—you—and finally to include the social world at large, he. However, as Piaget has demonstrated, the young child's egocentrism is manifest throughout the stage of pre-operations (2½-5), well after all pronoun forms have been adequately mastered. Goodenough's and Young's essential insight may, nevertheless, be accurate. The order of development of the child's first pronouns may reflect his emerging awareness of himself and others.

Other researchers have offered explanations based on linguistic theory to account for the order of pronoun acquisition. Nelson (1975) has suggested that the most difficult words linguistically are those which demand changes based on sentence context. The third person he and she demand changes based on gender and on case (he and she must
change to him and her in the objective case). I demands changes for case, but not for gender, as both male and female are I. The second-person pronoun, you, however, is not changed for gender or case; you is both nominative and objective. One might expect, therefore, that you would be more easily learned than I and he, but this expectation is not supported in any language studies.

There is, however, some evidence that linguistic complexity does underly pronoun development. Baron and Kaiser (1975) provide evidence that children slowly master the individual components of pronouns—gender, number, and person—before mastering a complete understanding of the pronoun. Baron and Kaiser predicted that children's pronoun errors would reveal a confusion between only a few linguistic components at a time. For example, I might be confused with you if the child had mastered only the fact that I is singular. I would be confused with we if the child only understood the first person component of I, but not its singularity. Similarly, a girl might confuse I and she if the component that she understood was only gender. Baron and Kaiser support their hypothesis in finding that there are more confusions in which one correct component is preserved (gender, number or person) than confusions in which no components of the correct pronouns are preserved. They conclude that personal
pronouns are learned through a step by step mastery of each component. How this step by step process occurs is a question which remains unexplored. These researchers found no developmental preference for which components—number, person, or gender—were preserved in the earliest pronoun errors.

Since _I_ and _you_ are the first nominative case pronouns to be used, one might extrapolate from Baron and Kaiser's study that singularity is the first pronoun component to be learned. _I_ and _you_ are both singular. When _I_ and _you_ are clearly differentiated from one another, mastery of the person component is evidenced. Finally, the child may gain an appreciation of the component gender, and the use of _he_ and _she_ can be mastered.

Fay (1971) offers an additional linguistic reason to explain pronoun development. Fay finds that the place that pronouns appear in a sentence determines how quickly they will be learned. Fay notes that in children's imitations of adult utterances, the ends of sentences are preserved. Therefore, the objective case pronouns such as _me_ and _you_ should be the first pronouns learned. _I_ which rarely appears in conversational English at the end of a sentence should be mastered last. Fay presents evidence that _me_ is used slightly more readily than _I_. However, the popular notion of baby talk,
"me want a cookie" is rarely observed in young children (Nelson, 1975). In general, children master the use of I much more easily than Fay's theory predicts.

Perceptual complexity has been used as an explanation for the order of person pronoun development in an interesting study by Sharpless (1975). Sharpless refers to Clark's theory of semantic features which explains the development of opposite words by analyzing which words have the most perceptually salient feature (Clark, 1974). More develops before less, according to this theory, because the property of more is more apparent to the child. Less is then learned as the negative instance of more. Sharpless similarly analyzes the semantic features of pronouns. The semantic feature which explains the difference between I and you is the property of self vs. non-self. I is the simpler word, having the opposite semantic quality of self. You is learned as the opposite term, lacking the semantic feature of self. The second semantic property important in the development of pronouns is involvement vs. non-involvement. I and you have the property of involvement in the communicating dyad, while he denotes lack of involvement in direct communication. Thus, in the course of pronoun development the child learns to distinguish first between self and non-self, I and you, and then between involved communication (I and you) and
non-involved (he). The pronoun he which has two negative semantic features—non-self and non-involvement, is the most difficult to learn.

Sharpless' experiment reveals the perceptual cue which may underly these semantic features. First, children were tested in understanding pronouns by their responses to questions about I, (the experimenter), you (the child), and he, (a doll). Then, they were tested in an onlooker condition in which I was the experimenter you the doll, and he the child. The children responded more accurately in the first condition, than in the onlooker condition. Sharpless concludes that the perceptual feature of an adult's attention directed to the child is important in the development of the correct use of pronouns. The child in the onlooker condition fails to identify himself as he because he is missing the important perceptual cue of adult attention directed to him when he is asked to respond. In general, he and she are difficult because of the negative semantic features non-ego and non-involvement, and because they are used without a perceptual cue like attention to cue the child to meaning.

In addition to linguistic and perceptual factors, there may be purely cognitive reasons to explain the order of person pronoun acquisition. The concepts or meanings represented by various pronoun words may be indicative of different levels of cognitive development. For example,
the word _mine_ which emerges before _I_ may convey a cognitively less abstract meaning. Young toddlers will often touch objects and exclaim "mine". Rather than conveying the abstraction of ownership or possession, the toddler saying _mine_ is noting an association between himself and the object, perhaps related to location. This one word _mine_ refers to a whole pre-concept denoting the child's desire for and connection with a particular object (Miller & Yoder, 1974). This primitive demarcation of territorial ownership may be an important step in the child's identification of himself as an independent and differentiated being. The next important step in this differentiation process is the use of the word _I_. _I_ does not stand alone in early speech, but is used in conjunction with verbs or adjectives—_I want, I down_. _I_ is therefore a step beyond _mine_, as it implies that the child has a differentiated sense of himself which is constant across many contexts and changes of behavior and state. Thus, the use of the pronoun _I_ suggests a new flexibility of language expression in which the child can talk about himself as a unique entity in a variety of situations.

Nelson (1975) recognizes the flexibility that pronoun use grants the speaker and identifies the development of pronouns as a significant cognitive achievement.
She found in her samples of speech from 1½-2 year old children that those children who used more pronouns also used more sentences. According to Nelson, the use of pronouns increases the child's ability to express a greater range of meanings, and sentences become possible. Nelson traces two courses in the early development of language—referential and expressive. The referential speaker has a greater proportion of nouns to pronouns and his early speech consists of an expanding lexical vocabulary. He recognizes objects and calls them by name, but uses few pronouns on sentences. In contrast, the expressive speakers tend to have smaller vocabularies but use more sentence frames. They have mastered the form of language but lack many lexical elements to plug into the form. Examples of these early expressive sentences which use many pronouns are _I do, you do, do it_. These sentences express the child's awareness of certain basic semantic relations (I do--agent-action, do it--action-object) which will be the framework for forming many more sentences as the child's vocabulary increases. The paths of development of the referential and expressive speakers converge after two years and become indistinguishable. The referential child learns to use more pronouns and sentence frames with which to organize the elements in his vocabulary, while the expressive child learns new words to fit
into his sentence frames. Thus the importance of pronouns is that they are "dummy terms" which help provide a framework of semantic relations around which a variety of sentences can be formed. The importance of this function of pronouns in psychotic language will be explored later.

In summary, the course of pronoun development has been explained by reference to general psychological factors—egocentrism and self-awareness, linguistic factors—mastery of linguistic components and sentence order, perceptual factors—attention directed to the child, and cognitive factors—the emergence of abstract thinking and the formulation of semantic categories.

**Psychotic Language and Pronoun Development**

One might speculate, then, that the difficulty of the psychotic child with pronouns and with language in general may arise from any of these psychological, linguistic, perceptual or cognitive factors. From what is known about psychotic language it is reasonable to suspect that any of these factors may be influential in producing the pronoun confusion that these children evidence.

Each of these factors will be analyzed and their usefulness in explaining psychotic language will be explored. It should be remembered that the distinction between these elements is arbitrary, and they are only
being opposed to provide a framework for organizing the results and speculations about psychotic language.

First, the role of self-awareness as an explanation of pronoun deviance in psychotic children will be explored. Then perceptual factors that may account for psychotic pronoun difficulty will be reviewed. Finally, this paper will look at linguistic and cognitive viewpoints which help explain pronoun difficulties among psychotic children.

Impairment of Self-awareness

Creak (1963) includes "unawareness of identity" as one of the nine diagnostic indicators of childhood psychosis. Many theorists explain the absence of the pronoun I in the psychotic child as a function of this deficient self-awareness. This unawareness of identity is reflected in other psychotic symptoms such as haphazard repetitive behaviors which seem to lack self-directed motivation. According to this viewpoint the psychotic child's self-concept is so poorly differentiated that the word I lacks meaning for him.

In support of this viewpoint, clinicians have noted that the first spontaneous occurrence of the pronoun I often occurs in a context which is highly significant as a step in self-differentiation. Bettelheim (1969) claims that I is frequently uttered first in the context of "I have to go to the bathroom." The anal pre-occupation of many autistic children may be attempts to resolve the
dilemma of how something from the self can become non-self. Trustin (1972) describes an autistic child who first used I to say "I mend it" which was an important step in the resolution of his fear that he was a "broken" person. In saying "I mend it" he recognized his independent responsibility to re-construct himself. Bergman (1971) describes a dramatic turning point in the treatment of a symbiotic child when the child looked in the mirror and said "I and you" for the first time. Unfortunately, most clinicians who work with psychotic children do not witness such dramatic breakthroughs in pronoun usage accompanied by surges of self-awareness.

There is at least one experimental study which supports the close association between language and self-awareness. Ratusnik and Ratusnik (1976) trained schizophrenic children to use pronouns, questions and negatives, and they found that self-concept as measured by self-drawings increased significantly. This study suggests that it may be language skill which determines self-awareness, rather than self-awareness determining linguistic skill. This viewpoint is shared by other recent researchers (Rutter, 1968; Fay, 1971; Wing, 1976). Rutter (1968) concluded that a language deficit may be the central difficulty in autism, and all other symptoms such as lack of self-awareness may stem from the linguistic problem. The linguistically-handicapped psychotic child misses out on
the interpersonal verbal exchanges which help to sharpen a child's awareness of himself and his relation to others. The question of whether language precedes awareness, or awareness precedes language is ultimately unresolvable. It seems clear, however, that language skill and self-awareness are closely related.

It is important to examine the nature of this self-awareness deficit of psychotic children. There are two alternate ways of viewing the psychotic child's self-awareness deficiency, and these two perspectives have opposing implications for the development of language. Those who favor theories of organic etiology stress the psychotic child's developmental retardation in acquiring a concept of self. This developmental viewpoint predicts that psychotic language is delayed but develops according to normal sequences. In contrast, the psychoanalytic theorists (Bettelheim, 1969; Bosch, 1970) explain the psychotic child's seeming lack of self-awareness as a defense mechanism which protects the child from awareness of rejection he has experienced. Bettelheim claims that autistic children show an aversion to using I, and that they will avoid echoing utterances containing the first person pronoun. Similarly, Norman (1954) presents evidence that autistic children may use advanced forms such as the passive, to avoid the use of the personal pronoun. Bosch found in his sample of German autistic children that
they avoided the first pronoun and replaced it with he. He concurs with Bettelheim that this reflects a psychological defense against self-recognition.

Aside from the anecdotal evidence of these psychoanalytic theorists, there is no research evidence to support this viewpoint. Bartak and Rutter (1974) clearly refuted the position that the use of I is consciously avoided among autistic children. In their study of echolalia among autistic children, they varied the position of various pronouns and found that the pronoun I was echoed as frequently as other pronouns.

Other language studies have found that the development of language among autistic children is severely delayed but follows normal sequences (Wing, 1976; Silberg, 1978; Pierce and Bartolucci, 1977). Most probably the relationship between self-awareness and language among psychotic children is a developmental one. These children do not avoid the use of I in defensive regression, but are simply delayed in their acquisition of language concepts and concepts of self.

The apparent association between language and self-concept still leaves many questions unanswered. Most importantly, what other specific deficits can account for the psychotic child's developmental delay in both of these areas? Possibly, the psychotic child's difficulties in language and self-awareness may both be reduced to more basic problems of perception which interfere with many aspects of learning.
Perceptual Disability, Associated Attentional, and Processing Problems

Sharpless' theory that pronoun ability is dependent on perceptual cues is quite relevant to the case of the psychotic child. Most obviously, the perceptual cue of an adult's attention would be difficult for the autistic child to grasp since the autistic child typically averts his eyes to avoid meeting another's gaze. More generally, Clark (1973) has theorized that language development is dependent on the child's construction of a perceptual world. For example, knowledge of prepositions and relational words is based on the perceptual experiences of these properties in the real world. The evidence is well documented that the psychotic child may suffer from a wide range of perceptual disturbances which may interfere with the creation of a perceptual world. The autistic child will often hide his eyes or block his ears in response to visual or auditory input, as if the perception of these is painful. It has been observed that the autistic child has greater facility with the proximal receptors of touch and smell, rather than the distal receptors of vision and hearing (Norman, 1954). His non-reliance on visual and auditory receptors may relate to problems of attention, perception or processing of visual and auditory input.
Visual input. One source of evidence for a visual perceptive handicap among the autistic is derived from observed similarities between the autistic and the blind child. Both the autistic and blind child are prone to stereotyped motor habits such as hand-flapping, head-banging or body rocking (Stone, 1964). One hypothesis is that the lack of visual sensory stimulations produces a state of low arousal for which the child compensates by self-stimulatory behaviors. The speech habits of the blind and autistic child are also comparable. Both have a high percentage of echolalic speech (Fay, 1973), and most importantly, both reverse pronouns. Fay discusses pronoun reversal in the blind and suggests that the visual modality is very important for differentiating self and other. The subtlety of pronoun reversibility is missed by the visually handicapped child, who is dependent only on auditory cues to catch on to the shifting use of I and you.

The nature of the visual handicap of the autistic child is not readily apparent. Vision is quite adequate for self-propelled movement; the autistic child rarely trips over objects in his path. The nature of the autistic child's visual handicap has been explored by Hermelin and O'Conner (1970). Autistic children were presented with two tasks, one in which they were required to discriminate
objects based on shape, and another in which they had to discriminate on the basis of right-left position. The children learned the positional discrimination task significantly more quickly than the shape discrimination task. It is concluded that autistic children adequately process visual information about location, but not about shape or quality. Perhaps the visual quality of personhood, important in pronoun acquisition, is one quality that the autistic child has difficulty grasping.

Language research has indicated that one of the first distinctions expressed in the normal child's early speech is between animate and inanimate objects (Dale, 1976). It appears that the young autistic child has difficulty making this distinction. Treating people impersonally, as if they are objects, is one of the clinical red flags of the autistic syndrome. Rather than emotional withdrawal, this symptom may reflect a deficit in the perception of visual features about differences in the quality of objects. The difference between animate and inanimate, so obvious to the normal toddler may not be apparent to the visually handicapped autistic child. Similarly, the use of pronouns expressing that perceptual distinction is difficult for the autistic child.

Auditory input. Many autistic children are misdiagnosed by parents and professionals as deaf. The child's
seeming apathy in response to the spoken word gives rise to this erroneous diagnosis. However, the child will often startle in response to sudden sounds, and many autistic children have an aptitude for music. The autistic child's adequate hearing ability is further demonstrated by his exceptional echoing ability. Whereas the normal child of 2 to 2½ years restructures a model utterance when he imitates it, the autistic child echoes faithfully without re-structuring (Shapiro, Roberts and Fish, 1970). Often, he will recite verbatim long passages heard on television or radio programs, especially commercials which have been heard often. There is, however, little evidence that he understands what he is saying.

Auditory perception difficulties are evidenced among autistic children by their poor articulation and their obscuring of word boundaries in their speech (Goldfarb, Goldfarb, Braunstein and Scholl, 1972).

Goldfarb (1961) has suggested that the psychotic child's deficiency in speech results from inability to monitor his own auditory output. Goldfarb found that in contrast to normal children, the speech of schizophrenic children did not change when they heard themselves on a delayed auditory feedback machine. The psychotic child is apparently not attending to his own speech production. Language therapists have had success training autistic children to speak by
teaching them to attend to their own speech errors played back on a tape recorder (Yudkovitz and Rottersman, 1973).

Other theorists have proposed that the autistic child's auditory handicap relates to auditory processing, rather than perception or attention. Frith (1970) and Hermelin and O'Connor (1970) have proposed that autistic children have a deficiency in the detection of auditory sequences. In Frith's experiments, autistic, retarded, and normal children were given auditory sequences of strings of words. The sequences were composed of alternating patterns such as "horse shoe, horse shoe" or "horse horse, shoe shoe." Whereas the normal and retarded children could extract the relevant features and imitate the sequence, the autistic children would adopt one particular sequence and perseverate on it. Similarly, in a series of experiments by Hermelin and O'Connor (1970) the autistic children were superior to normal children on repeating strings of nonsense words with no apparent structure. However, the normal children were superior in repeating meaningful utterances for which an underlying pattern could be extracted. The autistic child's disability in detecting auditory structure is summed up neatly by Frith.

In the autistic child's behavior there appears to be a paradox between a failure to perceive structure and at the same time a morbid preoccupation with it. (p. 413)
On the one hand the child is fascinated by the repetitive structures of music, and on the other hand he is stymied by the more complex structure underlying language.

The difficulty in detecting auditory patterns may be useful in explaining pronoun confusion. The child cannot extract the underlying rule in the auditory input of spoken language that the speaking person is I, and the one spoken to is you.

Several language therapy programs have been based on the awareness of the autistic child's difficulty attending to, perceiving and processing auditory input. Fulwiler and Fouts (1976), for example, report success teaching an autistic child American sign language. In American sign language pronoun usage seems to present little problem for the autistic child. The sign for You give me is simply an outstretched hand which is close to the natural gesture which might be used to convey this intention. American sign language allows the autistic child to make interpersonal contact without the rigor of identifying and using abstract and interchangeable personal pronouns.

There has been some success teaching autistic children to use visual languages of concrete plastic symbols (Churchill, 1972; Premack & Premack, 1974; DeVilliers & Naughton, 1974). In these languages there is no necessity
for individual pronouns, as each person has one plastic symbol which, like a name, always refers to them. Self-referent utterances are of the form "Sarah (child's name) wants to eat." These visual languages overcome the autistic child's obstacle of trying to abstract meaning from auditory sequences.

**Cross-modal perceptual problems.** Other evidence suggests that the perceptual problems of the autistic child relate to an inability to make cross-modal associations. Bryson (1970) gave autistic children matching to sample tasks and found that they had difficulty only when the matching involved processing visual information and giving a verbal response. When the task involved only one sensory modality they had little difficulty. The importance of cross-modal associations in language learning is obvious. The association of auditory and visual input is one of the bases for the infant's development of language. The blind child's language may be delayed because he lacks the visual channel in association with the auditory.

This cross-modal deficiency can be related to the autistic child's classic insistence on literalness. He is prevented from forming a wide variety of inter-sensory associations, and meanings of words become rigidly implanted in his mind without connotative associations.
Words are associated only with the first context in which they were learned, and the autistic child cannot tolerate deviations from the original meaning. Creak (1972) describes, for example, an autistic child who objected to the expression "stand in here between". He insisted that one could not stand in and between at the same time; these words had been learned separately and remained in his mind as unreconcilable.

This rigidity is also demonstrated in pronoun confusion. The autistic child may wonder "if my mother is I how can I also be I?" The autistic child seems unable to catalogue and relate two separate perceptual experiences.

In summary, the autistic child's perceptual disability may be visual, auditory or cross-modal, and associated with attention and processing deficits which may result in difficulties of self-differentiation, decoding auditory sequences, or relating different perceptual experiences.

**Linguistic Disability**

Language delay is usually the first symptom that clues the parents of the autistic child that something is wrong with their child, and language disturbance remains a noted symptom even in the advanced autistic child. Rutter (1968) hypothesizes that the autistic child's deficit is primarily a linguistic one, and that the symptom of emotional aloofness may follow from this
primary linguistic problem. Similarly, Churchill (1972) argues that when the emotional difficulties subside, the autistic child presents the picture of severe aphasia and nothing more.

Modern language theorists have given up the notion that language ability is acquired through selective reinforcement. Instead, it is hypothesized that there is an innate language mechanism that accounts for the similarities in language development across widely disparate geographical areas. This innate language mechanism provides the child with a limited series of hypotheses about what a language is like, and a method for selectively scanning the adult utterances he hears to confirm or reject his hypotheses. Based on the difficulty with which the autistic child learns to speak, it is reasonable to assume that this innate language mechanism is disturbed in the autistic child. The child cannot actively scan auditory sequences and form rules to describe their structure. Studies of pattern detection by Hermelin and O'Connor (1970) have repeatedly demonstrated the autistic child's difficulty with this type of task.

This inability to detect patterns or form linguistic rules affects the autistic child's receptive language skill. Premack and Premack (1974), found that echolalic autistic children could not discriminate the simple
linguistic marker "s", signifying plural. They also had difficulty understanding passives, negatives and the importance of word order. They could not discriminate, for example, between "The dog chased the cat" and "The cat chased the dog." According to Weiland and Legg (1965) autistic children commonly use imperative verbs--Sit, Walk, Eat, which in English are uninflected. Perhaps the autistic child uses these forms because he has not learned the linguistic markers which change the uninflected verb form (Sits, Walked, Ate).

Bartolucci and Alvers (1974) found that it is the linguistic system of deixis which gives the autistic child most difficulty. This includes all forms which require contextual changes--adverbs, verb inflections, and particularly personal pronouns. Apparently, the autistic child does not grasp some of the basic rules of language. Thus, the autistic child cannot accomplish the step by step mastery of pronoun components such as that described by Baron and Kaiser (1975).

This inability to form rules and use them to generate new language results in the bizarre content of the psychotic child's speech. He lifts out whole sentences or phrases from speech he has heard and uses the same phrase inflexibility to convey one meaning. One autistic child said "No, I don't want any raisin bran" whenever he was
confronted with a situation he wanted to avoid. He used this phrase to mean "Leave me alone" (Silberg, 1976). Similar examples are noted throughout the literature (Wolff and Chess, 1965; Shapiro, Huebner, and Campbell, 1974). This inflexible use of language has been called metaphorical (Kanner, 1946) but it is unlike the metaphor of an adult speaker. An adult uses metaphor to clarify his intent by highlighting a comparison between two phenomena that were previously unrelated. The psychotic child's use of metaphor is related to the unconscious metaphor of a younger child who simply confuses word meanings in the early stages of semantic development. Chukovsky (1968) gives charming examples of the young child's unconscious metaphor which results from semantic confusion--"I am barefoot all over."

Simple echolalia, which has no communicative intent, may also be a result of the inability to decode linguistic sequences. Premack and Premack (1974) suggest that the autistic child echoes when he has no understanding of the intent of a question, but knows that a response is expected. It has often been suggested that echolalia is the main cause of pronoun reversal. The child who is asked "Do you want milk?" echoes "You want milk," and this is interpreted as affirmation. If the child is then given milk, he will be more likely to say "You want milk"
in the future. The strong correlation between ecolalia and pronoun reversal has been substantiated in the research (Weiland and Legg, 1965; Silberg, 1976). Fay (1971) provides the additional insight that the pronoun I rarely appears at the end of a sentence in conversational English. As children echo the ends of sentences rather than the beginnings, there is little opportunity for the autistic child to gain experience with I in his echoic utterances. Fay demonstrated experimentally that the normal child who imitates adult utterances quickly learns what Fay calls "mitigated echolalia"—the parent says "Do you want some?" and the child says "Do I want some?" This is a more advanced stage of echolalia which indicates that the child is beginning to master pronoun reversibility. There is little information about the occurrence of mitigated echolalia in psychotic speech. The occurrence of the mitigated form of echolalia would be significant in the autistic child as an indication that the child had begun to decode the linguistic rule of pronoun reversibility.

Although operant conditioning was rejected as the basis for language acquisition in normal children, it has been suggested that it is the only way autistic children can learn language (Dagleish, 1975; Ricks and Wing, 1975). Lovaas' (1967) success teaching language to autistic children through painstaking reinforcement has been widely publicized.
Premack & Premack were successful in using an operant conditioning approach to teach autistic children to discriminate the linguistic marker of plural. The slow step by step procedure demonstrates how difficult this task was for the autistic child. First a visual language was used, in which there was a separate plastic symbol called "plural". The children learned to discriminate between the presence and absence of this visual symbol and relate it to the presence of one or more M&Ms and cookies. There was no spontaneous generalization to spoken language, however, until the experimenter used the statement, "Take cookie plural." No evidence is given that the child progressed from this laboratory English to the spontaneous understanding of plurals in conversational English.

The Premacks, who have tested a wide range of linguistic skill from apes to normal children, are in a good position to evaluate the nature of the autistic child's linguistic deficit. The rapidity with which autistic children learn visual words in the laboratory setting leads them to the conclusion that unlike apes, non-verbal autistic children innately understand what a word is. They describe certain autistic children they have encountered who know many single words but cannot put even two of these words together to form a multi-word utterance. The Premacks express puzzlement at the autistic child's facility with words
coupled with a disability in sentence formation. Baltaxe and Simmons (1975) provide a theory of psychotic language which attempts to explain this particular pattern of linguistic disability. They call upon McNeill's theory that language acquisition requires two distinct capacities. The first capacity is referential, the ability to name objects and understand the simple word-referent relationship. The second capacity involves the recognition of functional linguistic relationships. According to Baltaxe and Simmons, it is this second relational ability that the psychotic child lacks. Although he may be capable of naming objects and increasing his vocabulary, he can't express the linguistic relationships that these objects have to one another. The relationship between speaker and person addressed—I and you—is one of the linguistic relationships that the autistic child has difficulty grasping.

In summary, the linguistic deficit of the psychotic child may be related to the basic innate mechanism responsible for language production. This deficit is reflected in an inability to decode linguistic sequences and apply linguistic rules, which may result in bizarre utterances, echolalia, and pronoun reversal. In addition, the autistic child has difficulty understanding basic linguistic relationships which are important in sentence
formation. However, the linguistic skill of understanding the word-referent relation necessary for naming objects is presumably intact in the psychotic child. An analysis of the psychotic child's cognitive strengths and weaknesses will shed further light on his linguistic capacity.

Cognitive Impairment

In addition to the psychological, perceptual, and linguistic factors which can account for language delay and pronoun confusion, there may be overall cognitive deficits that affect this aspect of the psychotic child's development. The effect of cognition on language is a subject of long-standing debate in developmental psychology. Piaget (1971) has contended that cognitive development is a prerequisite for linguistic competence. In contrast, the Russian psychologist Vygotsky (1962) contends that linguistic and cognitive skills proceed on two different developmental paths that merge eventually when language becomes rational. More radically, Whorf (1956) contended that our language actually determines what and how we think, but there is little research evidence to support this viewpoint. Much of the research evidence tends to support the Piagetian viewpoint that cognition has primacy over language. Furth's (1966) studies of deaf children show that these children successfully acquire cognitive structures despite obvious language deficits. Conversely, mentally retarded children with
obvious cognitive deficits tend to have language problems also. It has frequently been suggested that training in cognitive skills may overcome language deficits in the linguistically handicapped (Kahn, 1975; Moorehead, 1972).

Bowerman (1974) has analyzed several ways in which cognition may affect language acquisition. Linguistic skill requires:

1. The cognitive ability to symbolize.

2. The development of increasingly complex cognitive structures.

3. The development of cognitive categories to conceptualize experience such as--agents act on objects, actions are performed on objects.

Each of these cognitive factors will be examined in turn, and related to the development of language and pronoun in the psychotic child.

*Symbols*. One of the primary cognitive achievements that is a prerequisite for language is the ability to use symbols. The development of symbolic thought progresses through successive stages in which the symbol becomes separated from its referent and progressively removed from immediate action (Piaget, 1962). The developing child first uses expressive signals, then indices, and

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2 Bowerman also includes the category of "cognitive processing". As this category is difficult to differentiate from cognitive structure, studies of cognitive functioning in general, are subsumed under 2.
finally true symbols (Moorehead, 1974). Crying is the first expressive signal and is the most primitive form of signaling behavior. At first, the crying behavior of the infant signals distress reflexively—he is hurt and he cries. A higher level is achieved when the child can anticipate the occurrence of distress, and cry before the stressful event. With the emergence of the index, the child can reconstruct the occurrence of an event through imitation. Piaget describes, for example, how his own child opened and closed his mouth in imitation of a key ring that opened and closed. The signifier (the mouth) and the signified (the key ring) must still be in spatial and temporal proximity in this stage. In the final substage of the sensori-motor period true symbolic representation emerges. Thought is finally freed from action and the child develops the concept of object permanence. He can represent symbolically absent objects. The emergence of this true symbolic ability makes possible language communication.

In fact, Brown (1973) has determined that the concepts expressed in the child's first words reflect the rudimentary knowledge of object permanence that he has gained in the sensori-motor period. The semantic concepts of nomination—"that", recurrence—"more", and disappearance—"allgone", indicate the child's mastery of object
permanence and the freedom to symbolize that accompanies it. The close association between language and the mastery of sensor-motor schema is substantiated in the research on language-delayed children. Garber and David (1975) studying echolalic retarded children found that "no" is first used to convey concrete disappearance and only later the more abstract notions of rejection and denial.

It has been suggested that the autistic child's language problems may stem from a basic deficit in most forms of symbolic expression (Rutter, 1968; Ricks and Wing, 1975). Research evidence suggests that the entire sequence of sensori-motor behavior which leads to the acquisition of symbols may be disordered in the autistic child. Ricks and Wing found that even the expressive signals of autistic children differed from normal children. These researchers recorded the crying and pleasure noises of autistic, normal and retarded children and found that all parents could distinguish the meaning of normal and retarded children's pre-verbal sounds. The autistic child, however, had idiosyncratic cries which could only be interpreted by each child's individual parents.

There is evidence that the autistic child does not progress to the next level of symbolic acquisition, the use of appropriate signals of anticipation. Parents often report that their autistic children do not use the
anticipatory gesture of raising the arms in preparation for being picked up.

These children have difficulty imitating movements, and when they do imitate their imitations are echolalic, showing no assimilation of the new content into conceptual schema, as normal children do (Premack & Premack, 1974). They have difficulty miming gestures to represent simple activities, such as hair-brushing (Tubbs, 1966).

In addition to the delay in spoken language, autistic children do not use the symbolic gestures that normally accompany the emergence of language. The gestures of pointing, nodding and head-shaking are often absent (Ricks and Wing, 1975). This differentiates them from other language-impaired children such as aphasics, and suggests that their deficiency is related to an all-encompassing difficulty in most aspects of symbolic behavior.

The normal child's entry into the pre-operational stage is marked by the beginnings of symbolic play. Autistic children have little capacity for this form of play, and their play consists primarily of aimlessly spinning objects and using toys in non-functional repetitive ways. The relationship between symbolic play and language has been demonstrated by Moorehead and Johnson (1972). They tested linguistically deviant children in their willingness to substitute a piece of paper for a
blanket in doll play. The linguistically deviant children were unable to make this simple symbolic substitution. Although the researchers do not define what type of linguistic deviance these subjects had, it would be expected that autistic children would have equal difficulty with such a task.

Several theorists have proposed that language training for autistic and other linguistically deviant children should involve training in the sensori-motor experiences which give rise to the use of symbols (Kahn, 1975; Moorehead and Johnson, 1972). Miller and Miller (1973) forced autistic children to become actively involved in sensori-motor activities by training them to walk on jungle-gyms in the form of elevated boards. The children first learned signals to direct their movements which were closely associated with the physical activities they performed. Many children eventually progressed from the use of these concrete signals to truly symbolic spoken language.

Despite the evidence of a general symbolic deficit in the autistic child, there are certain aspects of symbolic skill with which the child is remarkably proficient. It has been reported that some autistic children may be highly skilled chess players, which demands knowledge of the movement patterns of chess pieces. In
addition, autistic children may learn to read music capably. The symbolic systems of chess and musical notes are rigid and inflexible, however. One note always stands for a given pitch, and one chess piece can only move in a specifically circumscribed manner. This is in contrast to the symbolism of language which is flexible and changing, full of connotative as well as denotative meanings. Apparently the autistic child has less difficulty with a symbol system of direct one-to-one correspondence. His literal use of language suggests that he tries to use language as a similarly rigid symbol system.

The development of symbolic ability is closely tied to the use of pronouns. Bosch (1970) is the chief theorist who has described this relationship in the speech of autistic children. Bosch contends that the symbolic deficit of the autistic child is chiefly manifest in his inability to represent himself abstractly and use the pronoun I. Bosch traces a series of steps for the emergence of I in the autistic child's speech. As with normal children, Bosch contends that my and mine are the earliest personal pronouns to emerge. The use of the term mine is then expanded to convey an agent involved in the ownership, and the first context in which I is used is in the expression I have. The next context of personal pronoun use is in action statements. Bosch is in agreement with
Piaget that verbal expression is closely associated with physical action in the early stages of speech. At the action stage the child can make statements such as "I walk, I run." According to Bosch, true representation occurs only in the final context of pronoun use which is description. At this stage, the autistic child finally has an abstract conception of himself as an entity separated from the actions he performs and he can describe himself—"I am."

In summary, the autistic child has been described as deficient in many forms of symbolic behavior, including spoken language, gestures, and play, but not the rigid symbolism of literal meanings. This symbolic deficit affects the autistic child's ability to abstractly represent himself, and use the pronoun I. The development of the use of this pronoun follows a sequence of increasingly abstract contexts, until the use of I for self-description is finally mastered.

**Cognitive structure.** In addition to symbolic ability, linguistic competence may depend on the emergence of basic cognitive structures. Werner (1963) characterizes cognitive development as a progressive differentiation and hierarchization. An increasing number of elements are distinguished and organized into increasingly complex structures. Goodson and Greenfield (1975) describe how
this hierarchic ability may be represented in language. Children first use simple sentences and later learn to embed these simple sentences into longer complex sentences. In general, syntax develops in the direction of increasing hierarchic structure. Shapiro, Huebner and Campbell (1974) describe a deficiency in hierarchic integration as one of the basic cognitive difficulties of psychotic children. The older linguistic forms remain along with newer forms, and the psychotic child has no method for selectively ranking what is more important, and which elements should be subsumed under which. The autistic child echoes whole phrases, including inappropriate pronouns, without any ability to dissect the elements of the phrase and organize them into appropriate meaning categories.

Basing their viewpoint on Piaget's theories, many researchers contend that the basic cognitive structures are first acquired in the context of action. For example, in simple hierarchization in the action realm, the child learns to build a block structure in which two blocks support a third. Goodson and Greenfield identify other cognitive components in addition to hierarchization which underly action strategies and are related to linguistic development. These cognitive components are interruption and role change. For example, in order to understand or
produce a complex sentence with an embedded clause, a child must be able to interrupt the primary thought, momentarily subordinate secondary information to it, and then return to the main intent of the statement. There are limitations even to an adult's capacity to master many interruptions; most adults cannot understand a sequence of "that's" such as "The cat that the dog that the man beat chased got away." In an ingenious experiment, Goodson and Greenfield devised strategies for tinker toy constructions which parallel this linguistic use of interruption. In mastering role change, the child must recognize that one word may have two semantic roles; a ball, for example, may be both subject of a sentence—ball roll, and object—hit ball. Goodson and Greenfield also parallel this linguistic skill in the action realm. In connecting tinker toys, if a child can use the same piece both actively and as a recipient of action, he has mastered role change. These researchers concluded that the development of the cognitive structures of hierarchization, interruption and role change in action strategies form a developmental sequence which matches linguistic development.

There is little research which investigates the acquisition of basic cognitive structure in autistic children to determine if their language disability is rooted in a more basic cognitive disability. It would be interesting
to see for example, whether autistic children who could not master hierarchization and role change in linguistic concepts could master these concepts successfully in the realm of action. Clinicians have observed that autistic children may occasionally be proficient in building tinker toy construction. It would be interesting to see whether these children use hierarchial strategies in these constructions. There has been at least one study of seriation among autistic children (Wing, 1976). The Piagetian seriation task involves arranging objects of graduated size in an ascending or descending order. This task may be related to the hierarchization task described by Greenfield, Nelson and Salzman, (1972) in which smaller objects must be subordinated to larger objects. Wing found that the autistic children were uniformly deficient in this ability, and one might expect them to have equal difficulty in using hierarchial building strategies.

Another significant cognitive achievement which underlies language skill is the acquisition of concepts of invariance. The first important invariant that the child learns of is the permanence of objects. The importance of object permanence to the development of symbols has been discussed in the previous section. In the concrete operation stage the child learns the invariance of
objects which undergo surface changes of shape—conservation. In language, the child must learn to conserve the invariant aspect of certain words which undergo changes of meaning in different contexts. "The balloon is high" for example, means something different in a house than it does outside (Clark, 1973). The child must grasp the invariant aspect of high, which relates it to a relative standard (either the ceiling, or the sky). Similarly in mastering pronoun use, the child must grasp the invariance of self and other, of gender (he and she) and of number.

Although there is no research that investigates the autistic child's attainment of these concepts, one might speculate that autistic children have difficulty identifying the invariant qualities of objects and situations. One of Kanner's chief criteria for diagnosis was the autistic child's overwhelming need to "preserve sameness." These children may become severely upset if furniture is rearranged in a familiar room. This suggests that the autistic child is unable to form invariant stable concepts which are preserved despite surface changes.

The analysis of causality is another cognitive milestone which prepares the child to use language effectively. The use of the basic sentence frame, agent-action depends on the child's understanding of the fact
that actions are caused (Brown, 1970). Even in early sentences, before an agent is expressed, there is evidence that the child assumes the existence of an agent which has caused a specific action (Sinclair-de-Zwart, 1973). It would be interesting to learn whether autistic children who utter statements without pronouns are assuming the existence of an unexpressed agent. It is possible, however, that they lack the basic cognitive schema which dictates that actions need agents.

In summary, the autistic child's language disability may be related to the development of basic cognitive structures such as hierarchization, role change, interruption, invariance and causality which may be reflected in the realm of action as well as language.

Semantic relations. The final way in which cognition can affect language according to Bowerman is through the formation of categories to express relations observed in the environment. Language theorists have begun to discard the notion that early speech has a predetermined grammar, such as pivot grammar. Instead, Brown (1973), Schlesinger (1974), and Bowerman (1974) have favored the idea that semantic categories such as agent-action, and action-object underly early linguistic utterances. The components of these early utterances are one word expressions which describe the individual elements
of action, agent, and object. According to Schlesinger (1974) there is a set order for the development of these early utterances. First the child refers to objects, then to actions, and finally to agents. These component words are then arranged into the basic categories of relation which describe the structure of the child's experience.

Theorists have attempted to identify the basic relations that early language expressed. Bowerman's semantic categories are (1) agent-action ("ball fall"); (2) action-object ("hit ball"); (3) possession ("my ball"); (4) demonstrative ("that ball"); (5) attribution ("big ball"). Brown includes additional categories describing the locations of objects and action—"there ball." An additional category is the "experiencer" category which stems from the agent-action category, but includes statements of description such as "I feel" (Chafe, 1970).

There is relatively little research on the emergence of these semantic relations. It has been repeatedly suggested that the difficulties of linguistically deviant children can be attributed to impairments in the use of these forms. Buium (1974) tested the emergence of semantic-relational concepts in the speech of Down's Syndrome children and found that they used the same relations as normal children, but developed the concepts more slowly than normal children. Buium suggests that
language training for these children consist of repeated presentations of concrete instances of these relations to facilitate learning. Miller and Yoder (1974) describe a language training system which takes the child through progressive steps in the mastery of semantic relational forms. Moorehead and Johnson (1972) determined that linguistically deviant children used fewer of Bowerman's semantic relational categories than age-matched normal children.

The emergence of semantic relational categories in the language of autistic children is a relatively unexplored area. There is reason to believe that this is one area where the differences in autistic language would be dramatically illustrated. As discussed earlier, Baltaxe and Simmons (1975) contrast referential with relational ability and pinpoint the relational aspect of language as the autistic child's chief area of confusion. The formation of semantic categories may be the chief function of this relational ability.

It appears that the autistic child capably acquires one word references but cannot formulate relational categories to describe the interactions of these referents. One might speculate that the autistic child has most facility with Schlesinger's earliest category of referents—objects. The first words of autistic children are often names of objects, and the usual "Mommy" and
"Daddy" may never be uttered. Ward and Hoddinott (1968) and Weiland and Legg (1965) also demonstrated that speech related to objects was the category of speech most easily acquired among autistic children.

One might speculate that the category of agent presents the autistic child with most difficulty. One of the earliest evidences of the emergence of the agent category in normal children is in the third sub-stage of the sensori-motor period when the child can intentionally put an object in an adult's hands and expect action, rather than simply pushing the adult's hand towards the object (Moorehead and Moorehead, 1974). This demonstrates that the child recognizes the adult as an independent agent. Many older autistic children may persist in using this primitive gesture of pushing adult's hands towards a desired object rather than intentionally placing the object in the adult's hand. The autistic child's difficulty understanding causality and understanding the distinction between animate and inanimate may also interfere with the emergence of the agent concept.

Schlesinger (1974) describes the emergence of the agent category in normal children's early utterances. First the child himself is agent. Even before the child refers to himself verbally I is an implicit agent in the child's early utterances, according to Schlesinger. Next the other animate beings are viewed as agents and finally
inanimate objects are seen as agents of action.

Bosch (1970) deals with the emergence of the agent concept in autistic child's language which contrasts with Schlesinger's analysis. According to Bosch, the concept of self as agent of an action is last to develop. Bosch hypothesizes that other people (he) and inanimate objects are used as agents before the child can represent himself or an immediate other (I and you) in this role. Because of these supposed differences between normal and autistic development of the agent concept, which is reflected in the order in which pronouns are acquired, it is an important area of investigation.

The order of development of different relational categories (agent-action, possession, attribution, etc.) is another area which has been relatively unexplored. Bosch, however, has discussed a predicted order of development for his contexts of pronoun use (first possession, then action, then description). It should be noted that Bosch's categories of possession, action, and description are not discussed within the linguistic framework of semantic relational categories. However, Bosch's contexts for pronoun use are clearly parallel to the semantic categories discussed by Brown and others. All theorists find possession and agent-action to be among the earliest semantic categories used. A later category is what Chafe (1970) calls agent-experiencer and Bosch calls description.
According to Brown this category which includes statements like "I feel" develops in Stage II of early language. Thus, Bosch's prediction about the order of development of possession, action, and description contexts are in accordance with the observations of language theorists. Bosch's theory, however, is more restrictive as he confines his theory to the development of pronoun use in these semantic contexts. To this author's knowledge, no other linguistic researchers have presented a semantic theory to explain the contexts in which pronouns develop.

The important connection between the expression of semantic relational categories and pronoun use has been highlighted by Nelson (1975). Nelson found two distinguishable courses in early language development, one referential which emphasized vocabulary acquisition, and the other expressive, emphasizing the expression of semantic relations. The expressive children used significantly more pronouns in their early speech. It follows that the autistic child's language would more closely resemble the referential course of language development in which objects are named but the semantic relations of early language in which pronouns are frequently used are not expressed. It is hypothesized that the autistic child's pronoun difficulty relates specifically to this cognitive difficulty in the formation of semantic relational
categories. This difficulty is viewed as a developmental delay stemming from the many perceptual and cognitive deficits of autistic children which delay the emergence of the category of agent and prevent the formation of basic semantic relationships.

In summary, a cognitive viewpoint suggests many explanations for the psychotic child's language problems. It has been shown that the psychotic child has difficulty with symbolic development, difficulty with certain important cognitive milestones which may underly language use, and difficulty organizing his experience into semantic-relational categories. All of these cognitive difficulties may specifically affect pronoun acquisition.

Summary and Rationale for this Research

It has been shown that the correct use of pronouns is an important developmental achievement. It reveals the child's developing sense of self-awareness, his sensitivity to perceptual experiences which allow him to understand relationships between people and objects, his understanding of important linguistic markers and rules, and his cognitive ability to organize his perceptions and abstractly symbolize the world in terms of semantic categories. The psychotic child who has well-documented disabilities in each of these areas is understandably also deficient in the use of pronouns.
A deficiency of self-awareness was found to be inadequate as the sole cause of language delay among autistic children. The language delay of autistic children is generally global, and not confined to specific semantic content connoting self-awareness, as some theorists suggest (Bettelheim, 1969; Bosch, 1970) (as discussed on page 14). It is clear that self-awareness increases concommitantly with developing linguistic skill. Rather than debate the primacy of language over self-awareness, it is more important to examine how awareness gradually unfolds in the language of the psychotic child. Related to the issue of language and self-awareness is the controversy over whether psychotic language represents a global development delay or a defensive regression (as discussed on page 14).

The perceptual handicaps of the psychotic child are important for understanding pronouns and language delay. The psychotic child was shown to have visual, auditory, cross-modal, and processing deficits which prevent him from experiencing himself and the world in the usual way.

An analysis of the psychotic child's skills from a linguistic viewpoint revealed that he lacks basic rules for formulating and decoding language. It was suggested that the psychotic child has more difficulty with the relational than with the referential aspect of language.
The cognitive viewpoint suggested ways to view psychotic language disturbance as a broad-ranging cognitive deficit affecting many areas of functioning, including the use of symbolism, the understanding of semantic-relations, and the organization of complex cognitive structure. It was suggested that this deficit in cognitive structuring may be revealed in the action mode as well as in language.

It has been helpful to oppose these theoretical perspectives for the purpose of organizing the information on psychotic language and pronouns. In many cases, these varying perspectives are not mutually exclusive, but each reflect a different facet of the complex picture of psychotic language. However, some important questions and controversies recur—is psychotic language a developmental delay or a regression? How does normal pronoun development compare with psychotic pronoun development? What areas of linguistic competence are easiest for the psychotic child, and which are the most difficult? Does the child have general cognitive deficits which are evident in the realm of action as well as language? This research will address itself to these important questions suggested by this review of the literature.

The theoretical argument which has produced the most controversy is the question of whether psychotic language represents a developmental delay in language acquisition
or a wide-ranging deviance from normal development. The psychoanalytic theorists, Bosch (1970) and Bettelheim (1969) view psychotic language as a defense against self-recognition and therefore deviant from normal language development. As discussed on page 15, research evidence tends to support a developmental viewpoint. As this literature review has demonstrated, the same factors which allow for normal pronoun development are disturbed among psychotic children and therefore their language development is delayed.

One of the most important studies examining this problem (Silberg, 1978) analyzed the development of I, you, and he among psychotic children. This study concluded that psychotic children develop these words in the order of normal development—I, you and then he. This supports the developmental perspective on psychotic language and refutes Bosch's theory that he is used preferentially among autistic children.

Although several studies have produced similar conclusions regarding the psychotic child's language delay (Wing, 1976, Pierce & Bartolucci, 1977), no research has specifically compared pronoun development among language-matched normal and psychotic children. Such a comparison could reveal specific ways in which the psychotic child's development in this area is hampered, and could help delineate the psychotic child's specific language problems.
Thus, a comparison of normal and psychotic pronoun development is investigated in this research.

The comparison of normal and psychotic pronoun development may shed light on some of the hypotheses and perspectives offered in this literature review. The cognitive viewpoint suggested that autistic children may have a basic deficiency in understanding semantic relational categories such as agent-action, possession, agent-experiencer, etc. (as discussed on page 43). Bosch (1970) in discussing the language of autistic children, suggests that the semantic concepts of possession, action, and description (which parallel semantic relational categories discussed by other researchers) develop in a predictable order. He suggests that these categories are descriptive of the psychotic child's emerging understanding of himself and others. At least one research study (Silberg, 1978) supports the notion that the use of pronouns in the context of possession, action and description develops in the hypothesized order. Another purpose of this study, then, was to examine whether this order of pronoun development in different semantic contexts was true of normal children as well as psychotic children. This will help in clarifying how the child's emerging concept of himself and others is revealed in pronoun use.

Another important question which originates from the comparison of various theoretical perspectives is the
question of how far reaching are the disabilities of the psychotic child. Are they confined primarily to linguistic performance or do these deficits extend to general cognitive problems evident in action as well as language? The cognitive perspective suggested that the psychotic child's deficits may be evidenced in action patterns (as discussed on pages 33 and 40). Observation of young autistic children reveals that their behavior particularly in the area of symbolic development is deviant from infancy. Thus, an additional area this research investigates is how well the autistic child performs on a task of semantic relations demonstrated in the realm of action. It is hypothesized that autistic children will do poorly, as compared to language-matched normal children, on a task measuring the understanding of semantic relations in action patterns.

In contrast to the semantic relational ability, which involves symbolic representation of people and events, the autistic child may be adequate in the area of object-naming (Simmons & Baltaxe, 1975, as discussed on page 29). Theorists have suggested that the autistic child seems able to understand the referential aspect of language association between word and referent, better than the relational aspect of language. This hypothesis is also examined in this research. Performance on a task of linguistic reference is compared with performance on a
task of semantic-relations, and it is expected that autistic children will perform better on the referential task.

Finally, it has been suggested that psychotic children cannot organize their language into hierarchical categories as necessary for complex linguistic expression (Shapiro, Huebner & Campbell, 1974, as discussed on page 38). To determine whether this disability is manifest in action patterns as well as linguistically, it is studied in this research in a methodology modeled after Goodson and Greenfield (1975). It is hypothesized that psychotic children have difficulty with hierarchical construction in action as they do in language.

In conclusion, this research attempts a broad-ranging study of psychotic language and pronouns use. First to shed light on pronoun development, normal and psychotic pronoun development are compared. The development of the semantic contexts of early pronoun use are examined—possession, action, and description. Then, the child's performance on three cognitive-linguistic skills is examined—referential skill, semantic-relational skill, and hierarchical skill. The purpose of this research, then, is to describe how pronouns develop among psychotic children and to explore some cognitive-linguistic strengths and weaknesses which account for the psychotic child's language delays.
Hypotheses

The overall aim of this research is to compare the development of pronouns among normal and psychotic children to examine how the autistic child's development in this area is hampered.

The first purpose of this study is to examine the steps in the development of personal pronouns before each pronoun is used correctly. Specifically, this research examines the early forms autistic children use in pronoun contexts to see if they are comparable to the errors made by young normal children who are mastering this task. This research attempts to uncover a developmental sequence for the mastery of pronouns which may hold for both normal and autistic children.

In addition, the order of development of the pronouns I, you, and he is examined for autistic and normal children. It is predicted that the pronouns I, you, and he will develop in a comparable order for both normal and autistic children as predicted by a developmental viewpoint.

The contexts for the emerging use of pronouns are examined within the context of Bosch's theory. It is predicted that pronouns will be used in the context of possession, then action and finally description. This order of pronoun contexts is consistent with Bosch's theories, and with recent linguistic research on the
emergence of semantic relational categories.

Finally, some underlying cognitive-linguistic factors which relate to autistic language disability are examined. It is hypothesized that autistic children will perform more adequately on a task measuring linguistic reference than on a task measuring semantic relations.

The relationship between hierarchic complexity in action strategies and in language is also examined. It is predicted that difficulties in cognitive hierarchization is one cause of language delays in the autistic, and that hierarchic strategies in action patterns are delayed among the autistic.

These are the hypotheses of this research:

I. Normal and psychotic children evidence the same forms in their development of correct pronoun usage.

II. Normal and psychotic children develop the use of first person, second person and third person pronouns in the same order.

III. Normal and psychotic children learn to use personal pronouns in progressively more abstract contexts—from possession, to action and then to description.
IV. Psychotic children have a better capacity to understand the referential function of language than the semantic-relational aspect of language as compared to language-matched normal children.

V. Psychotic children, as compared to language-matched normal children, have difficulty using hierarchical building strategies, which relates to hierarchical difficulties in language use.
II

METHODOLOGY

Subjects

Twenty normal children and twenty psychotic children from the Columbus, Ohio area were used as subjects for this research.

The Normal Children

The twenty normal children, 11 boys and 9 girls, ranged in age from 18 months to 46 months (mean age = 2 years 5 months), and were selected from the Ohio State University Day Care Program, after informed consent was obtained from the parents. Teachers were asked to choose children who showed no evidence of language delay or emotional disturbance, and who lived in families where English was the only spoken language. None of these children evidenced any of Creak's criteria for childhood psychosis (see p. 56) in the way these symptoms are evidenced in a psychotic population.

These children covered the complete range of linguistic skill from those with no expressive language to children who had acquired all of the most basic rules of English usage.

Because the children came from a university population, their language development as a group is probably slightly
ahead of their age-matched peers. The children came from college-educated middle class families.

The Psychotic Children

The literature on childhood psychosis is filled with confusions of nomenclature. The primary difficulties have been in the differential diagnosis of autism and the related disorders of childhood schizophrenia, retardation, and even elective mutism. A short summary of some of the most glaring contradictions in the literature will help explain why diagnostic label was not used as a method for selecting these subjects.

Several theorists have insisted on the diagnostic separation of childhood schizophrenia from infantile autism (Rimland, 1964; Trustin, 1972). According to Trustin, one criteria for distinguishing the two disorders is whether the child looks away from people (schizophrenia), or through people (autism), and whether he is physically beautiful (autism). It is difficult to see how so subtle and subjective distinctions as these would be a useful basis for differential diagnosis. In addition, Trustin finds that autistic children are more intelligent and have earlier onset than childhood schizophrenics. Anthony (1958) also distinguishes a late onset childhood psychosis from an early-onset group. However, Anthony finds that the later onset group has higher
intelligence. There is wide variation in what is considered to be late onset childhood schizophrenia. For Rimland, onset after the first year of life no longer qualifies for the diagnosis of infantile autism. For Anthony, children may be diagnosed as autistic with onset any time in the first three years of life.

According to Trustin, another basis for distinguishing the two syndromes is whether the children were good babies (childhood schizophrenia) or bad babies (autistic children). In contrast, Deslauriers (1969) finds that unusually active or passive babies are two variations of infantile autism resulting from differences in arousal level.

Descriptions of characteristics of autistic children vary dramatically. Trustin (1972), Bettelheim (1969), and Kanner (1943) find that the autistic child has adequate speech under stress but is mute at other times. Wing (1976), however, considers that symptom evidence of elective mutism and claims that the truly autistic child evidences speech difficulty in all situations. The autistic children described by Bettelheim and Trustin are highly ideational, using abstract language fluently. For Kanner, however, lack of verbal imagination is an essential criteria for identification of the syndrome.

In one attempt to clarify this confusion, Creak (1963) identified nine points which cover all the identifying characteristics of childhood psychoses, including
childhood schizophrenia and autism. Studies have found that all institutionalized psychotic children had at least five of these symptoms (Goldfarb, 1970). These nine points have also been successfully used to differentiate between retarded children who are psychotic and non-psychotic (Cunningham, 1968).

Difficulties in language and pronoun use have been found in populations of children termed autistic (Bettelheim, 1969), psychotic (Weiland and Legg, 1965), schizophrenic (Shapiro, Fish and Ginsberg, 1972), and symbiotic (Bergman, 1971). Therefore, Creak's broad nine point criteria were used for selecting subjects for this research. Creak's nine points include:

1. Impairment of emotional relationships with people.
2. Resistance to change in the environment.
3. Unpredictable response to sensory input.
4. Disturbance in speech: echolalia, pronoun reversal, bizarre content.
5. Disturbance in motility: hyperkinesis, hypokinesis.
6. Retardation in some areas with islets of normal or exceptional performance in other areas.
7. Preoccupation with particular objects, without regard to their function.
8. Acute and excessive anxiety at seemingly harmless objects or events.


(The ninth criterion was excluded from this study because it is less objective and easily open to variations in interpretation.) To qualify as subjects for this study the children had to evidence at least five of these eight criteria. Lists of these criteria were circulated among cooperating schools and clinics and teachers and therapists selected potential subjects.

Additional screening involved consulting the children's parents to determine if language development was delayed from age two. One child met five of the criteria but showed no early developmental difficulties in language acquisition and was therefore excluded from this study. In addition, the only non-verbal children who were selected were those age five or under. Eisenberg (1957) concluded that the language level attained after age five was significant for predicting whether the psychotic child would ever acquire language ability. Those children who could not speak at all by this age, usually never developed language. Therefore, non-verbal psychotic children passed age five were considered a separate group of psychotic children who are probably more severely retarded, and they were not included in this sample.
Thus, childhood psychosis, as defined for this research, is a developmental disorder which interferes with the developmental task of language acquisition. It is comparable to the primary psychosis defined by Anthony, and should be contrasted with late onset (past age three) childhood schizophrenia (described by Eggers, 1978), or early onset adult schizophrenia.

The 20 psychotic children, 15 boys and 5 girls, ranged in age from 5 to 16 years (mean age = 7.8 years) and had a variety of diagnoses including autism, childhood schizophrenia, symbiotic psychosis, and withdrawing reaction of childhood. All children were enrolled in special educational programs in the Columbus public schools, or in private clinics, and the majority came from high school or college-educated middle class families.

The most commonly held symptoms were impairment of emotional relationships and language disturbance which were characteristic of all of the children. Two of the children evidenced only five of the symptoms, 12 children evidenced six symptoms, 3 children had seven of the criteria, and 3 had all eight of the qualifying criteria.

Because psychotic children may differ in their rates of language acquisition, age was not a useful way of distinguishing developmental level. Children were ranked developmentally by their longest spoken utterance, the
upper bound (UB). Brown (1973) discusses upper bound as one indicator of developmental level of language. Originally, this researcher intended to use mean length of utterance (MLU)—average number of morphemes per utterance—as the method of distinguishing language level. However, many of the psychotic children frequently uttered only one word at a time, which would have lowered the MLU scores unfairly. Their occasional longer utterances seemed to be better indicators of their language potential. The Upper Bound was calculated by counting the number of morphemes (smallest unit of meaning) in the longest utterance. Brown's guidelines were followed in breaking down the utterance into its component morphemes. Upper Bound scores were driven for both the normal and psychotic children and four UB levels were distinguished by the natural breaks in UB scores and the approximation of equal groups. Level I had six normal and six psychotic subjects with UB's ranging from 0-3 morphemes. Level II had four psychotic and four normal subjects with UB's ranging from 4-5 morphemes. Level III had six normal and six psychotic subjects with UB's ranging from 6-7 morphemes, and Level IV had four normal and four psychotic subjects with UB's ranging from 8-12 morphemes. The mean UBs for the matched normal and psychotic UB levels do not differ significantly. Table I presents the UB scores and summarizes some important characteristics of the subjects. It should
be noted that the normal and psychotic children were not matched for sex. An attempt was made to use an equal number of normal girls and boys, so that the normal language sample would reflect general language skill of the normal population unrelated to sex. The psychotic group, which had a preponderance of males, also reflected the sex breakdown of the target population. Various researchers have found that psychotic boys outnumber psychotic girls by 2 to 1, 2.5 to 1, or 2.7 to 1 (Goldfarb, 1970). Thus, each group's sex distribution reflected the sex breakdown of the population it represented. Since the children were matched for equivalent language development as shown by Upper Bound, the effects of sex differences would seem negligible.

The subjects were not matched exactly for social class. As noted earlier, all normal subjects and the majority of psychotic subjects came from middle class high school or college-educated families. Four of the psychotic children came from lower class poor families. The level of language studied in this research was too primitive to disclose subtle social class difference. The matching of comparison groups by language level using Upper Bound was considered sufficient for the comparison of normal and psychotic pronoun development.
TABLE 1
CHARACTERISTICS OF THE SUBJECTS

<table>
<thead>
<tr>
<th>Subject Number</th>
<th>Age (Yr. &amp; Mo)</th>
<th>Sex</th>
<th>UB</th>
<th>Symptoms Source</th>
<th>Referral Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.6</td>
<td>Boy</td>
<td>0</td>
<td>Childhood League</td>
<td>Ohio State Child Care Program</td>
</tr>
<tr>
<td>2</td>
<td>1.10</td>
<td>Girl</td>
<td>0</td>
<td>Public School</td>
<td>Care Program</td>
</tr>
<tr>
<td>3</td>
<td>1.8</td>
<td>Boy</td>
<td>1</td>
<td>Public School</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1.11</td>
<td>Boy</td>
<td>3</td>
<td>Public School</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1.8</td>
<td>Boy</td>
<td>3</td>
<td>Public School</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>Girl</td>
<td>3</td>
<td>Ohio State Child Care Program</td>
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<tr>
<td>7</td>
<td>2.2</td>
<td>Girl</td>
<td>4</td>
<td>St. Vincents</td>
<td></td>
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<tr>
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<td>2.6</td>
<td>Boy</td>
<td>4</td>
<td>Public School</td>
<td></td>
</tr>
<tr>
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<td>2.2</td>
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<td>Public School</td>
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<tr>
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<td>3.7</td>
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<td>6</td>
<td>Nisonger Center</td>
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<tr>
<td>12</td>
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<td>Girl</td>
<td>7</td>
<td>Childhood League</td>
<td></td>
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<tr>
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<td>7</td>
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<td>St. Vincents</td>
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<td>Public School</td>
<td></td>
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<tr>
<td>16</td>
<td>2.7</td>
<td>Girl</td>
<td>7</td>
<td>St. Vincents</td>
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<td></td>
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<tr>
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</tr>
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</tr>
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<td>3.10</td>
<td>Girl</td>
<td>10</td>
<td>St. Vincents</td>
<td></td>
</tr>
</tbody>
</table>

LEVEL I MEAN UB---1.3
LEVEL II MEAN UB---4.5
LEVEL III MEAN UB---6.8
LEVEL IV MEAN UB---10.25

LEVEL I MEAN UB---1.6
LEVEL II MEAN UB---4.5
LEVEL III MEAN UB---6.8
LEVEL IV MEAN UB---9.25
Procedure

The forty subjects were interviewed in 45 minute play sessions designed to measure pronoun skill, referential ability, semantic-relational ability, and hierarchic ability. The order of these four activities was randomly varied. A trained undergraduate psychology student observed each session and recorded the children's behavioral responses, and all language used.

All sessions began with a 5 to 10 minute free play period during which the child was encouraged to examine the experimenter's toys. In addition, the experimenter showed the child a children's book, and he was encouraged to talk about the pictures. The experimenter talked with the child freely during this initial stage, about his home, school, favorite foods, attempting to elicit as much speech as possible. This initial period served to acclimate the child to the experimenter, and as a basis for establishing the language level of the child, the Upper Bound.

The Pronoun Measure

The pronoun measure consisted of three activities designed to measure the use of pronouns in the contexts of possession, action, and description. For each activity the child was asked nine questions, three to measure the use of each of the pronouns, I, you, and he. A variety
of questions were used to maximize the child's chances of using pronouns. The questions were designed to elicit a variety of pronoun forms and to encourage the child's highest level of competence.

The child was introduced to a male hand puppet and told, "There are three people who will be playing with us today, you, me and him." The presence of the puppet gave the child the opportunity to use he as well as I and you.

Possession questions. The child was told, "When we are finished playing we will all get some raisins. These are for you, these are for me, and these are for him." Then, the following questions were asked to tap the child's understanding of pronouns in the context of possession. Three series of questions were asked to maximize the chances of the child using pronouns in responses.

To tap the use of possessive pronouns (mine, yours, his) the following questions were asked:

Whose are these? (Pointing to child's raisins)
Whose are these? (Pointing to experimenter's raisins)
Whose are these? (Pointing to puppet's raisins)

To allow for the use of objective case pronouns (me, you, him) or nominative case pronouns (I do, you do, he does) the following questions were asked:

Who has these? (child's)
Who has these? (experimenter's)
Who has these? (puppet's)
At the end of the activities, the children were allowed to eat the raisins and another set of questions were asked. In this set of questions a model sentence was used, to demonstrate the nominative case pronoun.

I have these, what do you have?
What does he have?
What do I have?

**Action questions.** For this activity, the child, experimenter, and puppet took turns bowling with a plastic bowling set. The following questions were asked to tap the use of pronouns in action contexts.

First, an open-ended question was used to see if the child would spontaneously use pronouns.

What happened? (child bowled)
What happened? (experimenter bowled)
What happened? (puppet bowled)

The next set of questions allowed the child to use either objective (me, you, him) or nominative case (I did, you did, he did) pronoun forms.

Who did that? (child)
Who did that? (experimenter)
Who did that? (puppet)
In the final set of questions a correct nominative case pronoun was demonstrated:

I knocked them down, what did you do?
What did he do?
What did I do?

One reason for the choice of a bowling game was the interest that this game elicits. In addition, the bowling game is especially appropriate for measuring the emergence of the agent concept. The game may be described in terms of three distinct semantic relations—the child rolling the ball (agent-action), the ball knocking down the pins (object-action), and the pins falling down (inanimate agent-action). When asked the open-ended question—What happened?—the child can choose to describe any or all of these three relations in his answer. The way in which the child chooses to describe what happened may reveal his level of understanding of himself as agent of the action.

One drawback of the question, "What happened?" is that it does not demand a pronoun response as do the other questions. However, there were sufficient pronoun responses in the action category for analysis of the data.

**Descriptive questions.** For this activity, the child, experimenter and puppet sat in front of a mirror 3' x 2',
and the following questions were asked to measure the use of pronouns in the context of description. Again the child was given the opportunity to use objective forms, or nominative case forms, and was given one model utterance which demonstrated the highest level of pronoun use.

Who is there? (child)
Who is there? (experimenter)
Who is there (puppet)

Who is a lady?
Who is a little boy (girl)?
Who is a puppet?

The experimenter then reached for the raisins and the following questions were asked:

I want some raisins, what do you want?
What does he want?
What do I want?

The phrase "I want" was included in the description category. Bosch classifies it in this category, and Brown (1973) includes it in the agent-experiencer semantic relation category, which is comparable to Bosch's description classification.

The "wh" questions of "What" and "Who" are the earliest to emerge (Hesse, Turnure and Buium, 1975; Brown, 1968). Many of the questions were therefore restricted to these easier "who" and "what" questions. The other question forms "Whose?" and "What..Do?" are of equivalent developmental difficulty (Ervin-Tripp, 1970).
Note that in each set of questions, the experimenter said one model statement which provided the child with a verb he could use in his answer. This was to discourage elliptical responses in which pronouns or verbs were missing.

The children's pronoun answers in response to these 27 questions were categorized and arranged in a developmental scalogram. The developmental scalogram has been described by Coombs and Smith (1973) and suggested for use in describing developmental phenomena such as language. (The scaling procedure will be described in further detail in the data analysis section.) The pronoun answers were rated according to the scalogram on a scale of 1 to 6.

The children's ratings for pronoun responses in each pronoun type category (I-possession, action, description; you-possession, action, description; he-possession, action, description) were averaged. Only classified pronoun responses were calculated in this average. A non-classified response was not averaged as zero, but ignored in the analysis. Thus, if one group of questions did not tap pronoun use readily, this did not affect the child's pronoun rating. The use of a variety of pronoun questions was intended to give many opportunities for pronoun use. The availability of opportunities to use pronouns and the scoring system which ignored lack of performance
tended to maximize the opportunity for the children to display their pronoun competence.

The Referential Measure

To measure the child's referential skill, his ability to understand the word-referent relationship, the Peabody Picture Vocabulary Test was used. This test measures only receptive vocabulary ability.

To provide more differentiation at the early levels of language, two questions were asked for each of the first ten picture pages of the Picture Vocabulary Book. A full list of vocabulary items is provided in the Appendix.

Children were asked to point to the picture named by the experimenter. Two of the psychotic children did not have a pointing response, and both of these children spontaneously took the experimenter's hand to point with. They were scored on whether they placed the experimenter's hand on the appropriate picture. For this task, the score was simply the number of items the child correctly identified until he made six errors out of eight questions.

The Semantic-Relational Measure

The author attempted to find a non-verbal symbol system which would parallel the semantic-relations
described in language. The task chosen involved two blocks, a large block and a small block, which represented the experimenter and the child. The activities of the experimenter and the child had to be demonstrated using these blocks. Blocks were chosen to represent people instead of dolls or human figures so that the symbols would have an arbitrary relationship to their referents. One important aspect of the symbolism of language is that there is no a priori relationship between words and their meanings. The experimenter wanted to establish a similarly arbitrary symbolic relationship between the blocks and the people they represented.

The child was introduced to the task by the following:

Do you see these two blocks, a big block and a little block? These blocks are going to do just what we do. When I lay down, the big block lays down (experimenter lays down and lays big block down). When I go back up the block goes back up. When I go over to you (experimenter moves over to the child) the big block moves over to the little block. When I go back the big block goes back. Now you try it. (a) When I lay down what does the big block do? (b) When I go over to you, what does the big block do?

If the child missed these two sample questions, his hand was moved by the experimenter to the correct action.
For the remainder of the items, the experimenter performed the actions and waited for the child to respond. Occasionally verbal prompts such as "What do you do with the blocks?" or gestural prompts of pointing to the blocks were used to encourage response.

The other items of this task were:

1. Jumping (agent-action). The experimenter jumped up and down, and the child was expected to move the big block up and down.

2. Sitting under the table (agent-location or agent-action). The experimenter moved to sit under the table or desk and the child was expected to place the big block there.

3. Touching the child (agent-action-object). The experimenter touched the child and the child was expected to move the big and little blocks in proximity.

4. Hit the floor (action-object or agent-action). The experimenter hit the floor with his hand repeatedly, and the child was expected to hit the floor with the big block.

5. Put on hat (agent-attribute, or possession). The experimenter put on a red hat and the child was expected to put a small red chip on the big block. If the child failed to respond correctly
to this item, the correct response was demonstrated.

6. Put hat on child (agent-possession). The red hat was placed on the child who was expected to put the red chip on the small block.

7. Walk around (agent-action). The experimenter walked around the room, and the child was expected to move the big block around.

8. Look in mirror (agent-action). The experimenter looked in the mirror and the child was expected to place the large block in front of the mirror.

9. Turn around (agent-action). The experimenter stood up and spun around, and the child was expected to spin the large block.

It is difficult to assess how closely these activities match the specific semantic-relational categories suggested. In some cases it could be argued that several semantic-relational categories were represented by one task. The semantic-relational categories were used primarily to provide a variety of ideas for manipulating the blocks that represent activities with which the child was familiar. The data were not grouped into the suggested categories of agent-action, agent-attribute or object-action. The child was graded independently on his performance on each task.
The children were given a score ranging from 0 to 4 for their performance on each item of this task. A score of 0 was given if the child did not respond, or if he perseverated on an incorrect response. The child scored one point if he performed correctly the times that had been previously demonstrated (sample item a and b, or 5). A score of 2 meant that the child showed some symbolic grasp of the task, but not the specific representations of each symbol. Examples of 2 responses are (a) putting the block on his own head for item 5; (b) tapping his own shoulder with the block for item 3. A score of 3 was given if the child did the appropriate action, but used the wrong block. A score of 4 meant the child performed exactly correctly.

This scaled scoring was necessary to differentiate the lower level children, some of whom had no items completely correct.

The child's score for this test was the sum of his scores for each item. The highest possible score was 38.

The Hierarchical Measure

To test the child's ability to use hierarchical strategies in the action realm, two different tasks were used. The first test involved stacking cups. Greenfield, Nelson and Saltzman (1972) found that there is a developmental sequence for the emergence of cup stacking strategies.
First the child can pair only two cups together. The next stage is piling or stacking in which the child can pile a stack of cups always using the same base. One cup always remains the object of action, while the other cups are the actors on this one stationary object.

A more advanced level of cup stacking is termed "role change." In this strategy the actor and object of action can change roles, so the base of the cup stack may change as the child builds it. The child may stack one cup on another, and then move the whole onto the next cup.

Goodson and Greenfield (1975) discuss another component that hierarchic organization requires— interruption. A higher level of hierarchic difficulty is evidenced when a child can momentarily interrupt the main goal, perform a minor sub-goal, and return to the main goal. In applying this concept of interruption to cup stacking, this author has derived an additional cup stacking strategy which involves both role change and interruption, and is therefore the most advanced cup-stacking strategy. For this strategy, the child momentarily interrupts the main goal of stacking all the cups by building two separate stacks and then joining them. The three strategies of piling, role change, and role change-interrupted are depicted in Figure 1.

The child was asked to put his cups together and
Figure 1: Cup-Stacking Strategies
his spontaneous strategy was noted. Then the child was asked to put his together in the same way as the experimenter, and the experimenter demonstrated each strategy in turn. The child scored 1 point for piling, 2 points for role change, and 3 points for role change-interrupted.

The materials used were two matching sets of four paper cups of different colors. The experimenter demonstrated the strategies on one set, and the child was expected to imitate the action on his own set of four cups.

The second hierarchical task involved the building of a simple block construction. Goodson and Greenfield (1975) described two alternate strategies for manipulating tinker toys to build a simple bench. One strategy is a step by step construction, and the other involves interruption, in which one side is completed, the action interrupted, and then the other side is completed.

The task used for this research was modelled after Goodson and Greenfield's task, but Lego construction blocks were used instead of tinker toys because they are easier for 1½ and 2 year olds to manipulate. The child was shown a Lego structure called a "boat" and was told to build one just like the model. It was noted whether the child built the boat using a step by step method--termed simple assembly, or an interrupted method--termed interrupted assembly.

The two methods are pictured in Figure 2.
**SIMPLE METHOD**

step 1

step 2

step 3

step 4

**INTERRUPTED METHOD**

step 1

step 2

step 3

step 4

*Figure 2: Boat-Building Strategies*
For the simple method, the base of the structure was built first, and the two smaller blocks attached later. For the interrupted method, one half of the boat was completed and then the other half attached. The child was given an opportunity to use both strategies in building the structure. The trained observer identified the strategy that the child used spontaneously, and then the experimenter demonstrated the other strategy for the child to use. If the child spontaneously used neither strategy both were demonstrated (first the simple method and then the uninterrupted method) and an opportunity was given to build the boat after each demonstration. The model boat was left standing after the demonstration. The instructions emphasized that the child was to build the boat "in just the same way" as the experimenter. The emphasis in the instructions was on the process of building more than the final product.

A visual inspection of the data verified that interrupted construction was indeed a more advanced strategy. Ten children successfully built the boat using the simple strategy, but could not do the interrupted strategy after demonstration. Only two children successfully used the interrupted strategy, but did not use the simple strategy even after demonstration.

For this task, 1 point was given for successfully
building the base of the boat, 2 points for building half of the boat as required for the interrupted strategy, 3 points for completed simple assembly, and 4 points for completed interrupted assembly. If the pieces were not attached securely, full credit was given anyway, as the experimenter was testing the cognitive organization that construction allows, and not the manual dexterity that construction requires. A total score of 7 was possible for both hierarchical tests—3 points for the most advanced cup stacking strategy, and 4 points for completed interrupted assembly of the boat.

Data Analysis

To test the first hypothesis, a developmental scalogram was used to determine a sequence for the developing use of pronouns. The children's varying responses to the pronoun questions were grouped into categories—noises, echolalia, pronoun reversal, use of proper names, use of objective forms, and use of subjective case pronoun forms in sentences. A perfect developmental scalogram requires that a child evidence only contiguous development categories. Thus, if a child showed an earlier form such as echolalia and a late form such as correct subjective form pronoun use, it would constitute an error in the developmental scalogram. The developmental scalogram assumes that several stages of developmental phenomena can co-occur.
during a developmental process. As the earlier forms fade, new forms emerge, but some old forms may co-exist with earlier form. The developmental scalogram as described by Coombs and Smith (1973) is particularly appropriate for linguistic development where the assumption of the co-existence of old and new forms is accurate. A total of seven developmental scalograms were constructed, one for the development of each of the pronouns—_I_, _you_, and _he_, for the normal and psychotic children, and one scalogram combining all the pronouns and subjects. The scalograms were constructed in the following way.

First, this researcher inspected the data to derive possible categories for describing the children's responses to the pronoun questions. These categories were arranged, combined, and rearranged until the data most closely approximated a perfect developmental scalogram. At times categories were combined which did not seem to be closely related, only because they developed concurrently according to the developmental scalogram. For example, rating 5 included a variety of pronoun forms (see p. 86). Response categories were narrowed down to the following:

1. Noise. The most primitive response to the pronoun questions was unintelligible noises or sounds. These included the repetition of syllables, "ba, ba, ba," or vowel sounds, such as "eeeee."
2. Echoing. All types of echoing responses were included in the category. This includes echoing the whole question asked or perseverating on an echo of a previous statement or question. Several children, for example, continued to say "happened" in response to all of the action questions.

3. Inappropriate Response. This is a category which includes many types of inappropriate responses. The most common type of response results from an apparent misunderstanding of the question. For example, several children answered "raisins" in response to "Whose are these?". Also included in this category are pronoun reversals, that is using the wrong personal pronoun in response to the question. For example, if the child was asked "Whose are these?" about his raisins and he responded "Yours," his response was scored in this category. Another type of response scored in this category was "mitigated echolalia", that is, echolalia in which the pronouns are correctly reversed. For example, when a child was asked, "What did you do?" one child responded, "What did I do?"

4. Proper Names. Responses were scored in this category if the child used his own proper name
to refer to himself, or if he called the experimenter or puppet by a proper name or noun without a particle. Some children made up proper names to call the experimenter and the puppet (who was given no name). Other children called the puppet "Puppet" and the experimenter "Lady." "Puppet" and "Lady" were considered use of a proper name, whereas the puppet and the lady were not scored in this category. Examples from this category include: Amy's raisins; Lady do that; Ghostman raisins.

5. Objective and Possessive Forms, and Nominative Forms Alone. The correct use of mine, my, his, him, her, hers, your and yours were included in this category. Also included here were possessive forms incorrectly used in the subjective position, such as "My did that," and incorrect possessive forms such as him's. In addition, nominative case forms standing alone, not in sentences, were categorized here, such as he, she, I and you.

6. Nominative Case Forms in Sentences. Classified here were all forms with the correct nominative case pronouns. It was unimportant whether the verb was correctly inflected. Examples include: "I done good," "He has raisin," "You is lady."
Some responses seemed to give little information about the child's personal pronoun ability in the context of this study. These responses were not classified in any of the above categories and did not enter into the analysis. The unclassified responses include: (1) responses with elliptical pronouns ("What did you do?"—"Knock 'em down."); (2) responses with neuter pronouns ("What happened?"—"It did.").

The validity of the constructed scalograms were measured with the formula 1-errors/responses, suggested by Torgerson (1958) for use with scalograms of this form. Any deviations from the perfect scalogram form were considered errors. For example, if a child showed responses of types 1, 2, and 3, there would be no error. If he evidenced 1 (noise), and 3 (inappropriate response) but not 2 (echolalia) it would constitute one error. If the child evidenced only types 1 (noise) and 4 (proper names) it would constitute 2 errors in defiance of a perfect developmental scalogram. In general, any time a child's responses were rated in non-contiguous categories, an error in the scalogram was scored.

The child's mean rating was computed for each of the nine question categories—Possession: I, you, he; Action: I, you, he; and Description: I, you, he. There were three questions in each of the nine categories, and
the child's rating was his mean performance on all three questions. Only those responses which were classified in the six scalogram levels entered into those mean ratings. However, if a child had no verbal responses at all for a given category, he was given a score of 0 for that category.

These nine observations on each subject were analyzed with a multivariate analysis of variance of the form 2 groups (normal, psychotic) x 4 UB levels x 3 types (possession, action, description) x 3 pronouns (I, you and he).

To test for significant differences between the children's performance on the three cognitive measures (referential ability, semantic-relational ability, and hierarchical ability), an additional multivariate analysis of variance was performed of the form 2 groups x 4 UB levels x 3 skills (referential, semantic-relational, hierarchical).
III

RESULTS

Hypothesis I

Normal and psychotic children evidence the same forms in their development of correct pronoun usage.

As discussed earlier, the first hypothesis was tested with a developmental scalogram as described by Coombs and Smith (1973). Pronoun responses were arranged, combined, and re-arranged until the pattern most closely approximated a perfect developmental scalogram. In a perfect developmental scalogram, all subjects would have ratings in contiguous categories. For example, a child who had a rating of 6 (nominative case pronoun in a sentence) on one pronoun response and a rating of 2 (echo) on another response would not fit a perfect scalogram. Conversely, a child who evidenced a rating 1 (sounds), 2 (echo), and 3 (inappropriate response), would be consistent with the assumptions of the developmental scalogram. Seven scalograms were constructed—for the normal children's I, you, and he responses, the psychotic children's I, you, and he responses, and one scalogram combining all pronouns and all subjects. The first hypothesis would predict that the same scalogram categories would produce equally valid
scalograms for both normal and psychotic children. The validity of the scalogram was tested with the reproducibility score \(1 - \frac{\text{Errors}}{\text{Responses}}\), where an error is any deviation from the perfect scalogram. The valid scalograms would mean that normal and psychotic children go through the same stages in the development of correct pronoun use.

All the developmental scalograms constructed had a high degree of reproducibility. This means that the six pronoun response ratings of noise, echo, inappropriate response, proper name, objective form, and subjective forms, form a valid developmental sequence. Children tended to develop these pronoun responses in a predictable developmental sequence. The same sequence of development applied equally well for the normal and psychotic children and for the development of I, you and he. The coefficients of reproducibility for each of the seven scalograms are listed in Table 2.

As all of the scalogram reproducibility scores are above .95, the scalograms can be considered valid. Thus it may be concluded, in accordance with the first hypothesis, that normal and psychotic children develop the correct use of pronouns according to the same developmental sequence.

To further test this hypothesis, the number of subjects with responses in each of the response categories
TABLE 2
Coefficients of Reproducibility for the Scalograms

<table>
<thead>
<tr>
<th>Pronoun</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Children's Scalograms</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>.95</td>
</tr>
<tr>
<td>You</td>
<td>.98</td>
</tr>
<tr>
<td>He</td>
<td>.95</td>
</tr>
<tr>
<td>Psychotic Children's Scalograms</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>.98</td>
</tr>
<tr>
<td>You</td>
<td>.96</td>
</tr>
<tr>
<td>He</td>
<td>.98</td>
</tr>
<tr>
<td>Scalogram of All Subjects and Pronouns Combined</td>
<td>.97</td>
</tr>
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TABLE 3
Number of Subjects with Responses in Each of the Scalogram Categories

<table>
<thead>
<tr>
<th>Scalogram Rating</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Psychotic</td>
<td>6</td>
<td>11</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>
were compared for the normal and psychotic children. These comparisons are shown in Table 3.

There are no significant differences between the normal and psychotic children in any of these categories. Even the difference in pronoun reversal which one might expect to appear much more frequently among the psychotic children did not reach a statistically significant difference. Again, this supports Hypothesis I that normal and psychotic children may go through similar developmental stages in their acquisition of correct pronoun forms. Examples of the pronoun reversals are presented in Table 4. As seen in Table 4, all of the pronoun reversals involve the inappropriate substitution of a first person pronoun, except one.

Hypothesis II

Normal and psychotic children develop the use of first person, second person and third person pronouns in the same order.

The second hypothesis concerning the order of development of I, you, and he was tested with a multivariate analysis of variance of the form 2 groups (normal, psychotic) x 4 UB Levels x 3 Pronouns (I, you, and he) x 3 types (possession, action, description). The dependent variables were the mean pronoun ratings (1 through 6) for each child in each pronoun-type category. For example,
a mean score of 4 for a child in the category of I-
possession would indicate that the child tended to use his
proper name (Johnny's raisins) in response to pronoun
questions addressed to him about possession. In review,
the scalogram rating categories are 1=noise, 2=echo,
3=inappropriate response, 4=proper names, 5=objective
forms, 6=nominative forms in sentences. As described
previously, the pronoun ratings were based on the scalo-
gram results. Hypothesis II would predict that there
would be no Group X Pronoun interaction. This would indi-
cate that the pattern of development of I, you and he
would be comparable for normal and psychotic children.
Also of interest are the Level X pronoun interactions
which show how the use of different pronouns may change
at each UB Level. The results are shown in Table 5,
and are presented in the form suggested by Poor (1973).

There is an overall significant difference between
I (X̄=3.6) and you (X̄=3.0), (p < .001), and between he
(X̄=3.4) and you, (p < .001). However, the difference be-
tween he and I is not significant. It may be concluded
that I and he are mastered more easily than you.

There is no significant Group X Pronoun Interaction
(p < .59). This indicates that both psychotic and normal
children may show approximately the same overall develop-
ment in their acquisition of these pronouns, in support of
Hypothesis II.
TABLE 4
Examples of Pronoun Reversals

Psychotic Children:
1. Q—Whose are these? (exp)*
   A—mine
2. Q—Whose are these? (exp)
   A—me, my
3. Q—Who is a puppet?
   A—me
4. Q—Who is there? (exp)
   A—What's my name?
5. Q—Whose are these (exp)
   A—mine

Normal Children:
1. Q—Who did that? (exp)
   A—him
2. Q—What did he do?
   A—my did ball
3. Q—What do I have?
   A—my raisins

*exp—The question was asked about the experimenter. Thus, a you or yours response was appropriate.
An analysis by level gives further insight into the relative development of the pronouns I, you, and he. As seen in Table 5, the Level X Pronoun interaction is significant \((p < .004)\). Post hoc Sheffé Tests show that this interaction results mainly from the difference between I and you. Even at Level 1, I (\(\bar{X}=1.6\)) is being used in a more advanced manner than you (\(\bar{X}=1.2\)). The use of I continues to progress rapidly as compared to you (Level II, \(\bar{X}(I)=3.5\) vs. \(\bar{X}(you)=2.0\), Level III, \(\bar{X}(I)=4.7\) vs. \(\bar{X}(you)=3.8\)). Finally at Level IV, I and you forms are equally advanced \(\bar{X}(I)=5.3\) vs. \(\bar{X}(you)=5.3\). The development of he seems to fall midway between I and you. It progresses significantly more quickly than you at Levels II and III, but significantly more slowly than I (Level I, \(\bar{X}(he)=1.6\), Level II, \(\bar{X}(he)=3.0\), Level III, \(\bar{X}(he)=4.4\), and Level IV \(\bar{X}(he)=5.2\)). This development of I, you and he is depicted in Figure 3.³

The Group X Level X Pronoun interaction is significant at \(p < .002\). Sheffé Tests show that the normal children acquire the use of I and you more quickly than the psychotic children, and this is what accounts for the significant interaction. At Level I, the use of I is equally advanced for both normal and psychotic children (1.4 vs. 1.3). However, I increases significantly more

³Although the number of subjects in each UB level is small, when UB Levels 1 and 2 are combined and contrasted with UB Levels 3 and 4, the effects of level remain significant. This is true for all significant findings regarding level in this study.
TABLE 5
Multivariate Analysis Summary Table:
Within Subject Effect—Pronouns

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<tr>
<th>Source</th>
<th>Effect</th>
<th>Error</th>
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</thead>
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<td>df</td>
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<td><strong>Main Effect</strong></td>
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<tr>
<td>I vs. You</td>
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<tr>
<td>You vs. He</td>
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<tr>
<td>I vs. He</td>
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<td>1.9</td>
<td>32</td>
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<td><strong>Interactions</strong></td>
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<tr>
<td>Group X Pronoun</td>
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<tr>
<td>Level X Pronoun</td>
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<td>62</td>
<td></td>
</tr>
<tr>
<td>I vs You</td>
<td>3</td>
<td>15.6</td>
<td>32</td>
</tr>
<tr>
<td>Group X Level X Pronoun</td>
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<td>62</td>
<td></td>
</tr>
<tr>
<td>I vs. You</td>
<td>3</td>
<td>2.9</td>
<td>32</td>
</tr>
<tr>
<td>You vs. He</td>
<td>3</td>
<td>9.8</td>
<td>32</td>
</tr>
</tbody>
</table>

*—p<.05
**—p<.01
***—p<.005
Figure 3: The Development of I, You and He at Different Upper Bound Levels (Level X Pronoun Interaction)
rapidly for the normal children at Level II (\(\bar{X}=4.2\)) and Level III (\(\bar{X}=4.9\)) than for the psychotic children (Level II, \(\bar{X}=2.8\); Level III, \(\bar{X}=4.4\)). By Level IV, the psychotic children surpass the normal children in their use of \(I\) in correct forms (\(\bar{X}(\text{psychotic})=5.5\) vs. \(\bar{X}(\text{normal})=5.0\)).

At Level I, the psychotic children are at least responding in some way to \textit{you} questions (\(\bar{X}=1.7\)) whereas the normal children tend not to respond at all (\(\bar{X}=1.7\)). However, the psychotic children make no significant progress in the use of \textit{you} from Level I to Level II (\(\bar{X}=1.9\)), while the normal children do make significant progress (\(\bar{X}=2.2\)) which continues to improve at Level III (\(\bar{X}=4.3\)). Again, the psychotic child's progress is not as rapid at Level III (\(\bar{X}=3.3\)), but at Level IV, both groups have achieved equal fluency with the use of \textit{you} (\(\bar{X}(\text{normal})=5.4\) vs. \(\bar{X}(\text{psychotic})=5.2\)).

The progress of \textit{he} for the psychotic children again is slightly slower, but the differences between the normal and psychotic children are not as dramatic. At Levels I (\(\bar{X}(\text{normal})=1.6\) vs. \(\bar{X}(\text{psychotic})=1.6\)); III (\(\bar{X}(\text{normal})=4.5\) vs. \(\bar{X}(\text{psychotic}=4.3\), and IV (\(\bar{X}(\text{normal})=5.4\) vs. \(\bar{X}(\text{psychotic})=5.1\)), the normal and psychotic children's use of \textit{he} are equivalent. Only at Level II is there a significant difference between the normal and psychotic children in their use of \textit{he}, (\(\bar{X}(\text{normal})=3.6\) vs \(\bar{X}(\text{psychotic})=2.4\)). The
Group X Level X Pronoun Interaction is depicted in Figure 4.

In summary, the results of the analysis of variance with respect to pronouns suggest that I and he develop more rapidly than you, that the normal children tend to learn these forms more quickly than the psychotic children, but the overall pattern for the acquisition of these forms is parallel among the normal and the psychotic children.

**Hypothesis III**

Normal and psychotic children learn to use personal pronouns in progressively more abstract contexts—from possession, to action and then to description.

Support is given for Hypothesis III. The results of the analysis by type (possession, action, description) are given in Table 6. There is no overall main effect of type. However, action responses ($\bar{X}=3.5$) are significantly more advanced than description responses ($\bar{X}=3.0$). This is in support of Hypothesis III, that the use of pronouns in action contexts should develop more quickly than the use of pronouns in description contexts.

More insight into the development of these sentence types is provided in the Level X Type analysis. The Level X Type interaction is significant ($p < .05$). Post hoc Sheffé Tests reveal what accounts for this significant interaction. At Level I, possession ($\bar{X}=1.5$), action ($\bar{X}=1.6$), and description ($\bar{X}=1.3$), responses do not differ significantly. At Level II, possession responses improve dramatically ($\bar{X}=3.3$) as compared to action ($\bar{X}=2.5$) and
Figure 4: The Differences in the Development of I, You, and He for Psychotic and Normal Children at Different Upper Bound Levels (Group X Level X Pronoun Interaction)
### TABLE 6

Multivariate Analysis Summary Table:

**Within Subject Effect - Type**

<table>
<thead>
<tr>
<th>Source</th>
<th>Effect df</th>
<th>SS</th>
<th>Error df</th>
<th>SS</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td><strong>Main Effect</strong></td>
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<td>31</td>
<td></td>
<td></td>
<td>2.2</td>
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<td>Act. vs Desc.</td>
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<td>4.6</td>
<td>32</td>
<td>33</td>
<td>4.4*</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Level X Type</td>
<td>6</td>
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<td>Poss. + Desc. vs Act.</td>
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<td>3.4</td>
<td>32</td>
<td>24.2</td>
<td>4.5*</td>
</tr>
</tbody>
</table>

*—p<.05
**—p<.01
***—p<.005
description responses ($\bar{x}=2.7$). At Level III, however, the development of action statements ($\bar{x}=4.6$) begins to surpass both possession ($\bar{x}=4.2$) and description statements ($\bar{x}=4.1$). These findings are also in accordance with Hypothesis III predicting that possession should develop more rapidly than action. The Level X Type interaction is depicted in Figure 5.

The Group X Type interaction is significant ($p < .006$). Post hoc Sheffé tests show that it is only the action category which accounts for this interaction. The average development of the action responses for normal children ($\bar{x}=3.8$) significantly exceeds the development of the action category among the psychotic ($\bar{x}=3.1$). The other values do not differ significantly. This is depicted in Figure 6.

The Group X Level X Type interaction supports this finding of the psychotic child's apparent slowness in acquiring the action statements. Although the overall Group X Level X Type interaction is not significant, there is a significant interaction between action as

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4Level IV action statements (5.5) again exceed possession and description statements, but this may be seen as an artifact of the measurement procedure and will not be considered a valid finding. Possession statements were clearly more likely to be rated 5 on the scalogram, since the possessive pronouns mine and and yours were by definition given the ranking of 5.
Figure 5: The Development of Possession, Action and Description Contexts at Different Upper Bound Levels (Level X Type Interaction)
Figure 6: The Differences Between Normal and Psychotic Children's Use of Possession, Action and Description Contexts (Group X Type Interaction)
compared to possession and description in UB Levels III and IV. Whereas the normal children have mastered action sentences adequately at Level III ($\bar{X}_{\text{normal}}=5.2$) the psychotic children are still using more primitive developmental forms in the action context ($\bar{X}_{\text{psychotic}}=3.8$). This deficiency in the use of action statements is overcome at Level IV where both normal and psychotic children use action adequately (5.5 vs. 5.5).

The results of the analysis of type suggest that possession, action, and description do develop in the hypothesized order. The results also suggest that psychotic children may take longer to develop these sentence types, especially the action type.

**Between Subject Effects**

There are no overall significant differences between groups. The overall differences between levels is highly significant ($p < .001$). This significance results from the differences between Levels I and II as compared to Levels III and IV. This indicates that the breakdown of subjects into upper bound levels was generally appropriate and consistent with the developmental progression of pronoun forms.

The overall Group X Level interaction is not significant. These findings are shown in Table 7.
TABLE 7
Multivariate Analysis Summary Table:
Between Subject Effects

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<tr>
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<th>Effect SS</th>
<th>Error df</th>
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<td>1.7</td>
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***—p<.005
Hypotheses IV and V

Psychotic children have a better capacity to understand the referential function of language than the semantic-relational aspect of language as compared to language-matched normal children.

Psychotic children, as compared to language-matched normal children, have difficulty using hierarchical building strategies, which relates to hierarchical difficulties in language use.

To evaluate Hypotheses IV and V concerning psychotic children's relative skill in three cognitive-linguistic areas, a multivariate analysis was performed of the form 2 groups (normal, psychotic) x 4 UB Levels x 3 skills (referential, semantic-relational, hierarchical). The hypotheses would predict that the older psychotic children would perform better than the younger normal children in referential skill. However, the psychotic children's hierarchical skill and semantic-relational skill should be equal to or inferior to the younger normal children.

In accordance with Hypothesis IV, the psychotic children performed better on the referential task than the matched normal children ($\bar{X}=38.55$ vs. $\bar{X}=30.13$, $p < .05$).

In contradiction to Hypothesis V, the psychotic children also did significantly better on the hierarchical task than did the normal children ($\bar{X}=3.74$ vs. $\bar{X}=2.99$, $p < .01$).

However, on the semantic-relational task the psychotic
children did not differ significantly from the 1½-3 year old normal children. In fact, their performance was slightly inferior, (X=6.25 vs. X=9.42). This result suggests that it is the skill measured by the semantic-relational task which is the most significant deficit related to the psychotic child's developmental language delay.

As seen in Table 8, there are significant differences between the levels for all three measures. The referential measure increases significantly at each UB level, and appears to be a skill that progresses evenly for both normal and psychotic children.

For the psychotic children there is a significant difference between all levels in their performance on the hierarchical measure (Level I, X=2.66, Level II, X=3.5, Level III, X=4.1, Level IV, X=5.5). For the normal children there is no significant difference between Level II and Level III performance on the hierarchic measure (Level I, X=1.1, Level II, X=2.5, Level III, X=2.8, Level IV, X=5.5).

In contrast to the linear progression of the referential and hierarchic skills, the development of relational skills follow an irregular course of development. Performance on this task decreases at Level II. For normal children the decrease is from X=8 at Level I to
### TABLE 8
Multivariate Analysis Summary Table
Measures: Referential, Relational, Hierarchical

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<td>Hier.</td>
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<td>3.0</td>
<td>32</td>
<td>63.8</td>
<td>F&lt;1</td>
</tr>
</tbody>
</table>

*p<.05  
**p<.01  
***p<.005
$\bar{X}=2.2$ at Level II. For psychotic children, the decrease is less dramatic, from $\bar{X}=3.5$ at Level I to $\bar{X}=2$ at Level II. The scores go up again at Level III and continue to rise at Level IV. This finding is depicted in Figure 7, where the scores are converted to standard scores for more efficient comparison. This unexpected dip in performance at Level II will be explored in the discussion section.

There are no significant Group X Level interactions for any of the three measures.

In summary, these results suggest that (1) normal and psychotic children seem to develop the sequences of pronoun usage in approximately the same order; (2) I and he appear to develop before you for both normal and psychotic children; (3) the contexts for the development of pronouns appear to follow the sequence predicted by Bosch; (4) referential and hierarchical skills are not particularly deficient in psychotic children as compared to language-matched normal children; and (5) semantic-relational skill as measured by this study is particularly difficult for psychotic children.
Figure 7: The Development of the 3 Cognitive-linguistic Measures Across 4 Upper Bound Levels for Normal and Psychotic Children
IV

DISCUSSION

The findings of this study are generally in accordance with experimental predictions, with certain surprises which shed interesting light on the language problems of childhood psychosis.

Developmental Sequence of Pronoun Forms

Hypothesis I

The sequence of linguistic forms validated by the scalogram, which describes the emergence of pronouns are in accordance with expectation. The progress from unintelligible sounds to eventual use of nominative case pronouns in answer to pronoun questions is consistent with linguistic research.

Scalogram Rating 1

The most primitive response to the pronoun questions were unintelligible noises or sounds. It is perhaps questionable whether these sounds legitimately constitute a step in the development of pronoun forms. This researcher decided to include this category in the scalogram because the children's unintelligible sounds appeared to be a primitive form of communication. It was noted, for
example, that one 18 month old child responded with mono-syllabic sounds, whenever the pronoun questions were directed to him. This child appeared to be picking up some subtle cue that the experimenter was involved and interested in the child most directly when she asked questions demanding a first person response—"What did you do?" The child responded to this involvement and excitement with sounds.

Other researchers have concluded that a child may decode pronouns before understanding any other aspect of a question. Fay (1974) describes children who responded with me to the question "What do you have?" Apparently the child understands that he is the person addressed, but not the content of the question. It is conceivable that this recognition of being the person addressed may occur even in the pre-verbal child, such as the 18 month old described. Although this study presents no statistical data to support this hypothesis, it is certainly worthy of future investigation. In any case, the phenomenon was striking enough with the one subject that it seemed reasonable to include unintelligible sounds as one expression of a differential responsiveness to pronoun questions. This recognition of self-involvement may result from the reading of postural, gestural, or facial cues, or tonal quality and not necessarily from the
linguistic decoding of the question. If these kinds of cues are indeed important in establishing a differential responsiveness to pronouns directed to the self, it may suggest an additional reason for the psychotic child's difficulty with pronouns. The subtle cues of facial expression and tonal quality are missed by the perceptually-impaired psychotic child.

Scalogram Rating 2

The next step of pronoun development described by the scalogram was the use of echolalia. This research concurs with the viewpoint of Premack and Premack (1974) that echolalia seems to indicate that the child has not understood the linguistic message. He is capable of a linguistic response but it is undifferentiated, consisting only of imitation.

Imitation seems to be a basic prerequisite for establishing communication between two beings. It is a way to establish commonality before any other basis for commonality exists. The psychotic child incapable of decoding linguistic output engages in imitation or echolalia, perhaps his only way of establishing a link with the adult communicator.

Perhaps the most interesting finding concerning echolalia was that normal children responded as frequently with this type of response as the psychotic children.
Past research has shown, however, that the echolalia of normal children is significantly different from that of psychotic children. Normal children tend to restructure the utterances that they are imitating (Shapiro, Roberts and Fish, 1970), and normal children imitate selectively those forms which they are in the process of mastering (Bloom, Hood, and Lightbown, 1974).

**Scalogram Rating 3**

The errors at the third scalogram level are some of the most interesting. At this point the child may understand certain aspects of the pronoun question. When asked "Whose are these?" the child may respond "raisins". He is one step beyond echolalia, as he can partially decode the question, although erroneously, and he is engaging in responsive communication.

**Pronoun reversal.** The three-level response of most concern is pronoun reversal. Most of the literature on psychotic language makes reference to this phenomenon as a significant characteristic of the psychotic child's disturbed language. The pronoun reversal observed in this study, however, differs from that described by other researchers in the area. All of the pronoun reversals observed among these psychotic children consisted of using a form of the first person pronoun, mine or my instead of you.
The avoidance of the first person pronoun, as described by Bettelheim (1969) was not observed, nor was substitution of third person forms for I, as described by Bosch (1962/1970). The children who showed pronoun reversal seemed to be making a simple error of overgeneralization. The terms in which the error occurred were the possessive pronouns my and mine. We might speculate that the children's understanding of the meaning of these pronouns was "ownership" or "possession" without the person or subject of the ownership being discriminated. Thus, the same word, mine, was understood as possession for self, and possession for second person other. This concept is in accordance with Miller and Yoder's (1974) speculations that mine is an early pre-concept which does not include the sense of a differentiated person.

The other significant finding concerning pronoun reversal was that a few of the normal toddlers also reversed their pronouns. Two of these three reversals were also errors of substituting mine for yours. As the words mine and my are the first pronouns acquired in the normal development of speech, it is not surprising that their meanings are over-extended during the early stages of speech. Clark (1973) described similar over-extensions during the early stages of the acquisition of new words.
Interestingly, there are few contemporary studies which describe pronoun reversal among normal children. Nelson (1975) concludes that pronoun reversal is not found in the normal development of pronouns. The only reference to normal pronoun reversal that this researcher found was in an early child biography. Sully (1895) noted that the substitution of me for you may be seen in children at 1½ to 2 years of age. It is viewed by Sully as a non-significant confusion which passes quickly as the child's language skill develops. In light of these similarities between the pronoun reversal of the normal and the psychotic children, the reversal phenomenon is viewed as developmental delay. Initially, pronoun reversal does not reflect an avoidance of I, but a simple over-extension of the use of a newly learned word. With language delayed psychotic children, this error may persist well into the school years.

Although this error may originate as a normal developmental confusion, there may be many reasons for its persistence. Perhaps most important is the subtlety of pronouns changing meaning with respect to speaker. To the literal-minded psychotic child, this reversible quality is difficult to grasp. It is difficult to see how avoidance of self-reference could be viewed as a factor in pronoun confusion. As this study shows, it is
primarily first person pronouns which are used, even erroneously, at the exclusion of second person pronouns.

These findings are in direct conflict with the commonly reported phenomena of pronoun reversal in which *you* is used instead of *I*. One of the subjects seen in this study did reportedly reverse pronouns in this way. For example, he would request permission by saying, "Do you have to go to the bathroom?" This form of erroneous pronoun use was not observed in the context of this research. However, it may also be explained as inappropriate generalization. The psychotic child who hears the phrase "Do you want..." in one context takes the whole phrase unchanged and re-applies it in the same context later. It is unclear whether there are any differences between the child who uses this kind of overgeneralization and the child who overgeneralizes individual pronouns.

**Scalogram Rating 4**

By the fourth scalogram level, the child has understood the message of the pronoun question. At this stage, the child corrects for possible confusions arising from the use of pronouns and he calls himself and others by proper names. This was a very widespread phenomenon occurring among 12 of the psychotic and 10 of the normal children. The frequent description of autistic children who refer to themselves in the "third" person is probably
a description of this fourth level phenomena of calling oneself by a proper name. The prevalence of using proper names among both the normal as well as psychotic subjects again suggests that it is a developmental phenomenon which does not fade out readily among the psychotic children.

Proper names were used instead of pronouns in all three subject conditions—first person, second person, and third person. Interestingly, several of the children, both normal and psychotic, simply made up names by which to refer to the experimenter and the puppet. The experimenter purposefully refrained from identifying herself by name, in order to encourage third person pronoun use. Despite this precaution, several children called the experimenter by a proper name of their friends or teacher. This occurred among both normal and psychotic children. The overgeneralization of a proper name can be viewed, in fact, as a type of pronoun use. It is as if the child uses "Susie" or "Becky" as an indefinite pronoun to mean any friendly adult. The difference between such idiosyncratic pronouns and the true second person is that the child has developed a category of related people which is meaningful to him. The grouping of all immediately interacting others into a group called **you** is not a conceptually salient division at this early
stage of language. It seems more logical for the child to generalize to a more limited category of people with whom he has specific kinds of interaction. It is also easier for the child to apply a word which does not have the reversible property of you.

The use of proper names in self-reference and other-reference is an important step in pronoun development. It establishes the child's sense of the uniqueness of himself and others as individual agents. This concept is an important step for the eventual use of correct pronouns. Sully (1895) describes this stage in the development of normal children's language and it has been documented since then (Huxley, 1970; Trantham and Pederson, 1976). Some children seem to persist in this habit longer than others. One normal child in the most advanced UB level persisted in referring to himself by his proper name.

Adults seem to sense that addressing children by their proper names instead of using pronouns makes their language easier to understand. "Does Johnny want some more milk?" is a common way of addressing a toddler. In fact, Boatman and Szurek (1966) suggest that the parents of schizophrenic children engage in the use of proper names in this fashion more frequently than the parents of normal children. Accordingly, they suggest that the
schizophrenic children pick up on their parent's verbal style. There are no data to support this viewpoint, however. The fact that psychotic children persist in self-reference through proper names is evidence of the developmental immaturity of their language rather than the inadequacy of their parent's language.

Scalogram Rating 5

By rating number five of the scalogram, the child is using appropriate pronouns for referring to himself and others. However, he has mastered only the objective and possessive forms of these words—my, mine, me, his, him, her, hers, your, yours and you. The mastery of these objective forms before the subjective or nominative case forms has been well documented in language research (Sully, 1895; Huxley, 1970; Fay, 1971). The reason for the precedence of these forms has been explored in the introductory section. These reasons include: 1) their appearance at the ends of sentences and the child's preference for words at the ends of sentences (Fay, 1971); 2) the words mine and yours describe a whole pre-concept dealing with possession and are not abstract words describing complex concepts of personhood and number, as are I and you (Miller and Yoder, 1974). Both of these reasons are considered valid explanations for the appearance of these forms before the nominative case pronoun forms.
Not only are these forms used in the end position, but their use is overgeneralized to the subject position—"Him does" and "Me do," and "My have" are commonly heard at this stage of pronoun use.

Scalogram Rating 6

Finally, at scalogram level six, correct subject forms are appropriately used in sentences. However, the child may still make inflectional errors in this stage, such as "I does." Children making these errors were not differentiated in this study from those who inflected correctly. The important consideration for this research was that the child rated 6 on all pronoun forms could appropriately use the nominative case pronouns I, you, and he as subjects of sentences.

In summary, Hypothesis I was supported in finding that both normal and psychotic children use the same early forms in their eventual development of the correct use of personal pronouns. Some of these earlier forms, including pronoun reversal and the use of proper names tend to persist longer among the psychotic children.

This suggests that psychotic children's supposedly "bizarre" symptoms in their use of language partially stems from developmental speech delays. The findings of these similarities between normal and psychotic speech is not intended to obscure the obvious differences.
Discussion of the subsequent data will further delineate the areas of difference between the two comparison groups.

Hypothesis II

Hypothesis II, predicting a comparable order for the emergence of the pronouns I, you and he for normal and psychotic children, was supported in this research. The only important difference between the normal and psychotic children's acquisition of these forms was that the psychotic children's progress in developing these forms is slower. Psychotic children were not showing equally advanced mastery of pronoun forms at UB levels equal to their matched normal counterparts. The slower pronoun development of the psychotic children is especially reflected in the development of the I and you forms. It is understandable that the psychotic children should have more difficulty with the reversible first and second person pronouns.

An analysis of the order of development of the forms I, you, and he presented somewhat surprising findings. The I forms advanced most readily for both normal and psychotic children. This again disproves the traditional notion of the psychotic child's supposed selective difficulty with the pronoun I. As shown previously (Silberg 1976), the pronoun I is, in fact, the first pronoun
used among psychotic children. The pronoun which
developed with the most difficulty was the pronoun
you. Both normal and psychotic children mastered this
pronoun more slowly than I or he.

One factor which seemed to prohibit the use of you
was shyness. The child's relationship with the examiner
seemed important in determining whether he would use the
word you. It was as if the word you had acquired a
particularly personal and emotionally charged connotation
which the child was unwilling to use with a strange adult.
This phenomenon was observed most poignantly when the
children were asked the question "Who is there?" about
the examiner. At this point, several children covered
their eyes shyly, and smiled or pointed. Although they
had been observed to use you on other occasions, they
seemed unwilling to apply the term to a strange adult.
The emotional connotation of the word you appears to
fade with time, and normal 3 year olds showed no reluctance
in using the term with a stranger. One might speculate
that the special and emotionally charged value of
the word you may originate in the mother-child relation-
ship. The mother is probably the first to call the child
you and the child may first use the word to describe his
mother. The mother-child relationship is the prototype
for any person to person interaction and the child
gradually learns to engage in person to person interaction with a matter of fact approach, and to use you without shyness or hesitancy.

The English-speaking child's unwillingness to use you in reference to strangers may reflect his differentiation of a separate linguistic category which may be universal. Several languages including French, Spanish and German have a familiar you, used with family members and close friends, and non-familiar you for acquaintances and strangers. It seems that the English-speaking child senses the important distinction between you familiar and non-familiar, but has no words in his language to describe this distinction. His sensing of the difference between the categories results in a general unwillingness to extend you learned as familiar, to the non-familiar sense. This observation suggests the possibility of interesting cross-cultural language studies on the acquisition of the familiar and non-familiar second person.

An additional factor prohibiting the rapid development of you is the frequently mentioned difficulty stemming from the reversible quality of the word. Although I has this same reversible aspect, I is more frequently heard, more personally valuable, and easier to imitate. The process of saying I or me is relatively easy to imitate. The child observes another individual speaking
of himself as I, and he can model that language form. However, the imitation of another person using you is much more subtle to pick up. The use of you immediately implies that there is a relationship between people to observe, which subtly cues the meaning of the pronouns. I is therefore easier to imitate and model directly without the complications of an implicit relationship. When I, me and my are successfully mastered, it may be overgeneralized to others, which results in the reversals described earlier.

The developmental order of the pronouns as suggested by this research (I, he, and you), is in contradiction to the expected order (I, you, and he), and highlights a contradiction which is present in the pronoun literature. Past research has determined that the third person he and she are the last to develop among normal children (Goodenough, 1938; Young, 1942; Nelson, 1975). At least one study (Silberg, 1978) confirms this same order of pronoun development among psychotic children. In contrast, Fay's (1971) theories might suggest that he is mastered more easily than I and you. An analysis of the measurement procedures of the varying studies can help shed light on this apparent contradiction. The earlier studies (Goodenough, 1938, and Young, 1942) measured pronoun development in terms of the frequency of correct use of the various pronouns. He was
used significantly less frequently by the younger children and was therefore seen as developing later. The Nelson (1975) and Silberg (1978) studies similarly measured the development of the pronoun *he* by determining its frequency. In contrast, this research determines development based on the sophistication of the pronoun forms used, rather than frequency. When this difference in procedure is taken into account, the supposedly contradictory findings are explainable. Although the third person pronouns are not used as frequently by the younger children, their most advanced forms (nominative case *he* and *she*) are mastered more easily than the nominative case *I* and *you*. The reason for the relatively easier mastery of *he* over *I* and *you* can again be explained by reference to the reversibility of *you*, and the shyness component described earlier. The young child has little opportunity or necessity for using *he* which describes an observation in which the child was not a direct participant. However, when the opportunity and necessity for *he* arises the child masters this form with relative ease.

The relative ease with which the nominative case *he* is mastered may be the source for the inference that psychotic children use *he* instead of *I* in self-reference. Although this research shows no support for such an inference, this research does support the fact that there
is slightly less difficulty for psychotic children in acquiring these forms. This is depicted in Figure 4 which shows that the difference between the normal and psychotic child's development is less dramatic for the pronoun he than for the other personal pronouns.

In conclusion, there are primarily two factors which interact to determine the order of personal pronoun acquisition—the utility and importance of the word in the child's expression, and linguistic complexity of the pronoun form. I surpasses the other two pronouns in utility and importance. He surpasses the other two pronouns in having least linguistic complexity. You becomes the greatest challenge, having a series of complicating linguistic factors—reversibility, imitative difficulty—and being of less significance to the primarily egocentric and socially shy toddler. These factors become exaggerated for the psychotic child who is both linguistically handicapped and socially retarded.

The Development of Possession, Action, and Description

Hypothesis III

Hypothesis III is supported by this study, and it is concluded that the use of pronouns proceeds through increasingly complex contexts of usage from possession to action and finally to description. This order of pronoun
context development was found to hold true for both normal and psychotic children's language development.

There was an important difference in the psychotic children's development of these pronoun uses. They demonstrated more difficulty using pronouns in the action contexts. This difficulty is depicted in Figure 6. The psychotic child's difficulty in acquiring the action concept in pronoun use may be attributed to his hypothesized problem with the agent concept in general. The transition from viewing the self and others as possessors to viewing persons as causative agents in actions contexts seems to be a difficult conceptual step for the psychotic child. As discussed earlier, the psychotic child may have trouble identifying cause and effect sequences, and perceptually and conceptually associating an agent with his resulting action.

This disability is consistent with his general difficulty in understanding relationships between people and events, which is essential for the semantic-relational aspect of linguistic functioning. Further difficulty in this area was demonstrated by the results of the semantic-relational task used in this research.

The possession-action-description developmental continuum is generally consistent with the speculations of at least two important developmental theorists. Piaget
(1971) theorizes that the child's cognitive development proceeds from the concrete to the abstract. In Piaget's perspective, the child becomes increasingly able to view himself as removed from his actions, and represents his activities abstractly. Piaget recognizes that in the early stages language is closely tied to action. Werner and Kaplan (1963) theorize that the beginnings of language are rooted in the child's experience of differentiation from the mother. The mastery of the possession forms may be viewed as a step in the differentiation process. Werner and Kaplan explain that the highest level of language is achieved when the symbol and referent are farthest apart, that is when language is on the level of pure representation, or description.

The Three Cognitive-Linguistic Measures

Hypotheses IV and V

It was expected that psychotic children would not display linguistic deficiency dramatically in their referential ability. This expectation was confirmed in that the psychotic children did significantly better than the normal children in receptive vocabulary involving the identification of pictures. Thus, the psychotic children at the same linguistic level as the normal children (as judged by UB level) knew more words, receptively. Their linguistic difficulty did not seem to center on the
acquisition of specific words as much as the structuring of these words into semantically complex sentences.

Within Nelson's (1975) descriptive scheme of early language as consisting of both referential and semantic ability, these psychotic children most resemble the normal children who show superiority in referential skill. However, unlike the normal children of Nelson's study, these psychotic youngsters do not go on to acquire easily the semantic structures necessary for the formation of complex sentences.

These results may be viewed as confirmation of Baltaxe and Simmons' (1975) description of psychotic language as heavily referential and lacking in semantic structure.

In light of the psychotic children's vastly higher age levels it is not surprising that they knew more words. However, it is of significance that their skill in language structure (measured by UB level) did not increase concomitantly with their skill in vocabulary.

Contrary to expectation, the psychotic children performed better than linguistically matched normal children on the task of hierarchic organization. This suggests that it is not a general deficiency in all aspects of cognitive structuring which is responsible for the psychotic child's linguistic difficulty. If psychotic children
do manifest hierarchic structuring difficulties, they are not related to the mode of sensori-motor construction, but are confined to the linguistic realm. The ability to use increasingly complex hierarchical structures in building strategies is apparently an age related skill in which the older, psychotic children performed better than the younger, normal children.

The psychotic children's success on the hierarchical task in this research fits into observations of visuo-spatial superiority of autistic and schizophrenic children (Wing, 1976). It has been observed that autistic children may be proficient at building, doing picture puzzles or other spatial and visuo-spatial tasks. As reported by Wing (1976) autistic children do have difficulty performing a Piagetian seriation task. This seriation task may be more complex than the hierarchic task required here, as it demands that the child organize pieces according to an internal schema of graduated size. The solution in the seriation task is not determined by visual qualities of the resulting structure, as in the hierarchic task.

Within a larger perspective, this negative finding suggests that it is specifically linguistic capabilities that the developmentally psychotic children lack. The cognitive structure required for a sensori-motor hierarchic
task was presumably well-developed among the psychotic children of this study.

In contrast to the above tasks where the psychotic children performed better than linguistically matched normals, on the semantic-relational task, the psychotic children performed equal to their normal counterparts. This indicates that it is specifically the area of semantic-relational skill as operationally defined in this study that is a key to understanding the psychotic child's language retardation.

The observation of the psychotic children attempting to carry out this task gave clinical support to this empirical finding. Many of the psychotic children given this task appeared completely stymied. Whereas they attended and performed on the other research tasks, they seemed to lack a basic sense of what was required in the semantic-relational task. Several children ignored the instructions and perseverated on stereotyped movements with the blocks. Other children threw the blocks, in contrast to their attentive behavior in other aspects of the experimental procedure.

It is perhaps questionable what the inability to perform this task signifies. The hypothesis was that the movement of blocks to parallel human movements would depict the semantic-relational aspect of language on an
action level. This task may also be viewed as a basic symbolic or representational task. These children are supposedly lacking in representational structures which describe relationships between objects and their movements. These are the basic structures which allow people to categorize their environment into agents and objects, nouns and verbs. The child who demonstrates a deficit in this capacity misses out on a method of organizing his perceptions of the world.

One advantage of positive findings in research is that one need not rely on the hypothetical constructs which were used to derive tests for the experimental hypothesis. The experimental tests become valuable data in themselves regardless of their relationship to the hypothetical constructs used to derive them. Thus the movement of blocks to represent people's activities may be viewed as an equivalent of linguistic semantic relations, or a task of gestural symbolic communication. However it is called or characterized, it does seem to identify a cognitive linguistic skill that these psychotic children lacked.

Interestingly, Taylor (1976) has devised a remedial strategy for autistic children which is similar to the semantic-relational task used in this research. In her training program, she uses sticks placed in horizontal,
vertical, or diagonal positions to represent activities of small doll figures. For example, the diagonal placed stick may mean "cow is running", or a vertical stick may mean "the cow is standing". There is an important distinction, however, between the program she outlines and the task required in this study. In her program there is a completely arbitrary relationship between the symbol and its meaning. In the experiment described here, the relationship between symbol and referent is not as arbitrary. When the experimenter jumped, the child had to represent this action with the block. The jumping of the block involves imitation of an action, in addition to the learning of an arbitrary symbolic relationship between the block and the experimenter. Thus, Taylor's task may be viewed as significantly more complex. Within Werner's scheme it is at the highest level of abstraction involving a complete separation of the symbol from its referent.

The experimental task used in this research may be used as an earlier step in a language remediation program like Taylor's. The underlying rationale of such a program is that the experience of gradually learning how to view symbolic relationships involving actors and agents will equip the child to be better able to perform that function in language. Controlled studies are needed
to determine if this is indeed a viable method of remediation for the language-handicapped psychotic child.

An unexpected finding concerning this task was the uneven progression of this skill across developmental levels. Unlike the other cognitive-linguistic tasks which showed a clear increase as UB Level increased, the semantic-relational task dipped at UB Level II among both psychotic and normal children. One possible explanation for this surprising finding may be a theory of critical periods for the development of a symbolic communication system. Perhaps the child around 1½ to 2 years is in a state of readiness to learn a system of symbolic communication. If he lived in a community of the deaf where only gestural language were used, his psychological readiness would equip him to learn a gestural symbolic communication system. What the semantic-relational task of this research demanded was to learn spontaneously a gestural method of representation. Perhaps some of the less mature children were at this stage of cognitive readiness. This state of readiness may decline as the child becomes immersed in the actual linguistic system of his own culture. At this time his mental energies must be spent in fortifying and expanding the linguistic system of his culture, and his sensitivity to new symbolic systems may be temporarily decreased. Thus,
the children at UB Level II had perhaps entered this stage of temporary insensitivity to learning new symbolic systems. Their scores on this task, consequently decreased. By UB Level III, they were cognitively sophisticated enough to grasp on to the new symbol system, and their scores again increased.

This hypothesized sensitive period may explain the non-linear pattern of scores among the normal children, the drop in performance from 8 at Level I to 2 at Level II. However, it is harder to apply such a theory to the psychotic children. Perhaps they never achieve such a sensitive period for acquisition of symbol systems, and their communication skills remain significantly impaired. The slight dip in scores at UB Level II from 3.1 to 2.17 is indeed not as pronounced among psychotic children and may be attributed to chance.

The concept of a critical period for aspects of language formation is consistent with language research. It is well known that after age 12, people have difficulty learning a foreign language and acquiring the nuances of a foreign accent. The first 12 years of life are thus viewed as a critical period for first language learning. Similar theories have been presented in developmental psychology to explain mother-child attachment.
This theory of a critical period for learning symbolic systems remains somewhat speculative, and should be examined in future research.

Conclusions

In conclusion, this research has arrived at some important findings concerning language and pronoun usage among psychotic children. Generally the results support a developmental viewpoint in understanding the deviant language of the psychotic child. It has been shown that both normal and psychotic children go through similar stages before the eventual correct use of pronouns. Even the supposedly idiosyncratic pronoun reversal was found to exist among some of the normal children attempting to learn these words, and it was explained as a simple overgeneralization of the meaning of a new word.

In contrast to past literature which pinpointed the word I as most problematic, this study found that the pronoun you leads to most difficulty for both normal and psychotic children.

This research found a developmental sequence in the emergence of contexts in which pronouns are used correctly, from possession to action and description. This sequence was found to hold true for both the normal and psychotic
child. However, the psychotic children evidence more difficulty in making the transition from possession to action, in which the subject is viewed in a cause and effect relationship as agent of an action. This difficulty in viewing subjects as agents relates to their use of pronouns in general and to the representation of agent-action relations in gestural language as well. This difficulty in conceptualizing subjects in association with actions is seen as the root of the psychotic child's language disfunction. He seems to lack the basic semantic categories which allow for the organization of his experience into meaningful units of relation. This disability is aggravated by the subtle linguistic functions—such as case changes and reversibility, which the child must learn in order to use pronouns correctly.

This relational skill has been contrasted with the referential function of early language, and this research shows that the referential function is not as seriously disturbed among psychotic children. They are more easily fluent with symbolic processes of one-to-one correspondence where one word has one unchanging referent.

Finally, building strategies which demand hierarchic organization were not specifically deficient among psychotic children. Although these building strategies have been related to the structural properties of language
in past research, the linguistic deficit of the psychotic child is not expressed in this one realm of activity. The psychotic child's deficiency in hierarchic organization is manifest specifically in language, but is not a general cognitive deficit interfering with all aspects of behavior.

**Practical Implications**

These findings may have practical implications for planning language therapy programs to correct the psychotic child's linguistic handicap. The developmental viewpoint makes remedial strategies readily apparent. The goal becomes clear cut—to propel the child along predictable developmental paths.

Thus, if a psychotic child is reversing pronouns, one might recommend as a first step that he learn to use his own proper names and other people's proper names to refer to subjects. This is the normal sequence in pronoun development and it would be unreasonable to expect the child to make the transition directly to the use of pronouns. Another useful technique may be to encourage the child to use proper names along with pronouns. The child may be taught to say, "John, I, want some candy." After repeatedly using phrases like this, the proper name may begin to serve as a cue to the correct pronoun choice.
When pronouns are introduced, the psychotic child should be encouraged to use possessive forms first. It may be useful to teach him a process of automatic reversals. For example, if he and the teacher are both in possession of something desired such as candy, he can be taught to say mine when he hears yours, and yours when he hears mine. Although this task will be automatic at first, after drilling in associated gestural movements and proper names, the child may learn to understand the reversible property of the pronouns. Another way to introduce drills in automatic reversal is to teach the child to use mitigated echolalia. When he hears the phrase "Do you want...?", he could be taught to echo with the reversal "Do I want...?"

Making the transition from possession to action statements may be especially hard for the psychotic child. Again, it may be useful to begin with simple statements in which proper names are used instead of pronouns—John go. To facilitate the child's concept learning of agent-action sentences, the instructor should give repeated examples of agent-action relations. This concept will be more easily mastered if there is continuous repetition of examples.

Language programs such as those recommended by Taylor (1976) may be appropriate to facilitate this development.
As suggested earlier, this program may need to be augmented with steps in which the referents are more closely connected to their symbols. The semantic-relational task used in this research may be the basis for one helpful training procedure.

The psychotic child's relative facility with the linguistic function of reference could be used in language training programs. The child who is at the earliest stages of language may be taught single words that represent whole concepts. Rather than demanding that the child compose whole sentences to express his request, the child may be encouraged to learn single words, such as names of favorite foods or activities. This way he can signal his needs in a clear and unencumbered way, without dealing in the difficulty of complex grammatical structure. The simple activity of pointing and identifying objects in his environment may help give the psychotic child a sense of control and predictability in his world.

The difficulty that these subjects experienced in the semantic-relational activity suggest a wide-range deficiency in representational skill. Symbolic play may be one modality in which this representational difficulty can be remediated. Although most psychotic children have difficulty engaging in symbolic play, with adult guidance they can be encouraged to pretend with
unstructured objects. Such activities may strengthen their overall representational capacity.

In light of the psychotic child's relative facility with hierarchical building strategies, this skill could be utilized in language programs. Researchers have used visual-symbol languages with autistic children in which they were required to place symbols on a magnetic or felt board. It is conceivable that such languages may be extended to three-dimensional characters and the children can be taught to physically build sentences with blocks that represent parts of a sentence. The hierarchical nature of sentence construction could thus be represented physically. Such a program would be complex to design and would probably have more heuristic value than practical utility in improving communication skills. It is, however, a fascinating direction for researchers interested in further analyzing the relationship between language and action strategies in the psychotic child's cognitive organization.

The eventual goal of these language programs would be the mastery of the final context of pronoun usage, description, when the child can represent himself and others as individual beings with specific characteristics. Training in this area should involve practice in differentiating and comparing characteristics of the self and
others. Concommitantly with improving language skills, such activities will help solidify for the child the boundaries between self and other.

The presumed relationship between the child's language skill and self-perception is an area of research which needs to be explored more fully. The children's responses to their own reflected image in a mirror gives some clue to their self-perception. Several interesting mirror responses were observed including staring, purposeful avoidance, and apathy. It would be worthwhile for future research to explore these reactions and correlate them with the level of pronoun use. Such research could give important information concerning the inter-relationship between self and other awareness and pronoun use.

In the final analysis, the whole purpose of investigating pronouns and their misuse is to gain insight into the psychotic child's self-perceptions. The psychotic child must learn to distinguish the boundaries between I and you and to view himself as consistent across all contexts of behavior. Only then will he make sense of his disorganized perceptions, learn to relate to others, and break through his psychotic isolation.
## APPENDIX

### Vocabulary Items Used in the Referential Measure

*(Peabody Picture Vocabulary Test)*

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<table>
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<tr>
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<tbody>
<tr>
<td>a. chair</td>
<td>19. fence</td>
<td>45. shining</td>
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<tr>
<td>b. butterfly</td>
<td>20. bat</td>
<td>46. dial</td>
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<tr>
<td>c. apple</td>
<td>21. bee</td>
<td>47. yawning</td>
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<tr>
<td>1. car</td>
<td>22. bush</td>
<td>48. tumble</td>
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<tr>
<td>table</td>
<td>23. pouring</td>
<td>49. signal</td>
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<tr>
<td>2. cow</td>
<td>24. sewing</td>
<td>50. capsule</td>
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<tr>
<td>knife</td>
<td>25. wiener</td>
<td>51. submarine</td>
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<tr>
<td>3. baby</td>
<td>26. teacher</td>
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<tr>
<td>horse</td>
<td>27. building</td>
<td>53. projector</td>
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<tr>
<td>4. girl</td>
<td>28. arrow</td>
<td>54. group</td>
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<td>dog</td>
<td>29. kangaroo</td>
<td>55. tackling</td>
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<td>5. ball</td>
<td>30. accident</td>
<td>56. transportation</td>
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<td>shoe</td>
<td>31. nest</td>
<td>57. counter</td>
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<td>6. block</td>
<td>32. caboose</td>
<td>58. ceremony</td>
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<td>7. clown</td>
<td>33. envelope</td>
<td>59. pod</td>
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<td>8. key</td>
<td>34. picking</td>
<td>60. bronco</td>
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<td>9. can</td>
<td>35. badge</td>
<td>61. directing</td>
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<td>10. chicken</td>
<td>36. goggles</td>
<td>62. funnel</td>
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<td>11. blowing</td>
<td>37. peacock</td>
<td>63. delight</td>
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<td>12. fan</td>
<td>38. queen</td>
<td>64. lecturer</td>
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<td>13. digging</td>
<td>39. coach</td>
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<td>42. freckle</td>
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<td>17. leaf</td>
<td>43. eagle</td>
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<td>18. tying</td>
<td>44. twist</td>
<td>70. stunt</td>
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</tbody>
</table>
71. meringue
72. appliance
73. chemist
74. arctic
75. destruction
76. hoisting
77. wailing
78. coil
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