# DEVELOPMENTAL ASPECTS OF "CHILDHOOD SCHIZOPHRENIA": A STRUCTURAL ANALYSIS USING A PIAGETIAN AND PSYCHOANALYTIC APPROACH

by

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Abstract

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This study attempted to explore the structural development and organization of children who had been diagnosed as schizophrenic and who should have reached a concrete operational stage of thought. The structural analysis was done from a Piagetian and psychoanalytic perspective.

The basic premise of the study was that the "schizophrenic" children would show problems in the development of their cognitive structures which would be reflected in their primary process thinking on the Rorschach.

The sample consisted of fourteen eight to twelve year old children who had been placed in a residential treatment center for emotionally disturbed children with the diagnosis of "childhood schizophrenia" or "ego deviant with underlying schizophrenic process." Because of the

premature termination of the collecting of the data the Piagetian findings are based on fourteen subjects while the primary process findings are based on eleven subjects.

Each child was individually tested on two sets of protocols. The first set consisted of five of Voyat's Piagetian tasks, each of which measures the child's task-specific stage of intellectual development. A special cognitive organization of "heterogeneous" was devised for those children who were at different stages on different tasks. The second protocol was a Rorschach test that was scored by an independent clinician according to Holt's method of analysis for primary process thinking.

Hypothesis I states that the "schizophrenic" children who chronologically should be at a concrete operational level of thought would instead fall into the three groupings of preoperational, heterogeneous and concrete operational. Hypothesis II states that the heterogeneous children would show a different order of succession of the tasks than what Piaget described for normal children, and Hypothesis IV stated that the achievement of class inclusion would be associated with increased defense effectiveness on the Rorschach. All were confirmed using the Fisher exact test for small samples in a two-tail test at the .05 level of significance. Hypothesis III, that expected to find that the children would have more difficulty on conservation of matter and one-to-one correspondence, was not

confirmed. The small amount of thought disorder found on the Rorschach made the lack of significant findings in Hypotheses VI and VII which stated that there would be a relationship between the type of thought disorder and cognitive level inconclusive. In addition, there was no relationship found between cognitive level and external reality-testing as stated in Hypotheses VIII, IX and X.

Additional findings using the Fisher exact test were that the tasks of one-to-one correspondence and class inclusion were critical operations in both cognitive and primary process development. High scores on one-to-one correspondence and class inclusion were associated with a low amount of formal deviations and density and a high amount of defense effectiveness and adaptive regression. Another finding of interest was that intrusions of egocentric thinking in the cognitive tasks was associated with a high defense demand and a low defense effectiveness on the Rorschach. A last important finding was that there was a positive relationship between the level of cognitive functioning and the age of the children.

The findings were regarded as reflecting underlying problems of structural differentiation which are reflected in the delay in cognitive development and the associated poorly controlled expression of primary process thinking. More specifically, the achievement of one-to-one correspondence was argued to be associated with critical structural changes that results in an important step in the process of differentiation

which in turn is important in the stabilization of external reality-testing during the expression of libidinal and aggressive wishes. Furthermore, the lack of structural closure associated with the concrete operational stage of thinking was hypothesized to be responsible for the fluctuations in both the affective and cognitive functioning of the heterogeneous children. A last point was that the importance of a developmental and structural approach to the diagnosis of children was given emphasis by the emergence of three diagnostic groupings in this population of supposedly "schizophrenic" children.

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# REVIEW OF THE LITERATURE

## Part I:

## Theoretical Overview

### Introduction

#### Purpose of this study

The purpose of this study is to gain more understanding of the structural development of children diagnosed as "schizophrenic." The thought processes of the child are of special relevance since this is one area that most often seems disturbed and is crucial in the child's ability to adapt to reality. Therefore, a structural analysis of the cognitive sphere of functioning and its relationship to disturbances in thinking of the "schizophrenic" child have been picked as the focus of this study.

A structural approach to the study of childhood schizophrenia has been chosen because this approach is essential to an understanding of childhood schizophrenia within a developmental context. As Flavell (1963) states: "there has to be something that changes with age . . . but also something more general than individual contents, something

that will pull diverse contents together into a single chunk" (p. 409). The concept of structural development allows the diverse elements of the functioning of schizophrenic children to be pulled together into this one "chunk" which can then be used to view their functioning within a developmental context.

The importance of the developmental context for the study of childhood schizophrenia brings me to the question of diagnosis which is always a difficult area. Diagnosis is an attempt to structure phenomena that have no innate organization. The way one structures the phenomena and what one chooses to observe is determined in part by one's theoretical orientation and in part by the goal of one's inquiry. The diagnosis of childhood schizophrenia includes are even more complicating factor which is that the child, unlike the adult, is still in the process of development. Taking a structural viewpoint, the schizophrenic child is still in the process of structuralization, unless there is an arrest of development which in itself is significant.

In diagnosing adults it is a common practice to use a symptoms approach: the way the symptoms are grouped determines the diagnostic category that the individual is placed in. This way of diagnosing originated from a medical model. But with children this approach is too limited and one runs the risk of misinterpreting the symptoms as well as being incorrect prognostically if one does not conceptualize the symptoms within a developmental context. For instance, because

of the child still being in the process of developing it is often difficult to tell whether what is being observed in a child is normal behavior that at a later age would be a sign of pathology or whether it is a sign of present disturbance. David Beres (1971) points out that even when there is pathology it is often hard to judge its extent since because of the ego's immaturity, psychopathology of every kind in young children will "carry a larger component of ego deviation than in the older child or adult" (1971, p. 173). For example, it is not a sign of psychosis for a preschool child to hear voices, although at a later age this would be thought of as a sign of severe disturbance. These factors intensify the risk of misinterpreting the symptoms. Prognostically, there are also pitfalls. As Anna Freud (1965) has pointed out, there is a push to finish development in children. One has difficulty in making an accurate prognosis with children because one does not know if this developmental push will help the child overcome his difficulties or not.

This is all just to emphasize that in dealing with childhood schizophrenia we are dealing with a complex entity. The findings must be viewed in a developmental context in order to facilitate our understanding of this entity. I have chosen both a Piagetian and a psychoanalytic approach to provide this developmental context and it is my hope that the present study will begin to create developmental criteria that will eliminate some of the confusion.

Piaget's conceptualization of cognition from a structural perspective makes his theory compatible with the structural viewpoint of psychoanalytic theory. I will briefly describe the two ways structure is conceptualized by these two theories, but the major exploration of the differences and similarities between their two concepts of structure will occur in the Review of the Literature.

In order to describe the psychoanalytic conceptualization of structure a brief and rather simplified overview of psychoanalytic theory as delineated by the ego psychologists is necessary. Harmann, Kris and Lowenstein (1946) conceptualize the personality as being divided into "three centers of psychic functioning that can be characterized according to their developmental level, the amount of energy invested in them, and their demarcation and interdependence at a given time." These three "psychic systems are defined by the functions attributed to them" (p. 14). The three systems are: the id whose functions are organized around instinctual demands; the ego whose function is to mediate between the instincts and external reality; and the superego whose functions are organized around moral demands. Each of these systems is made up of many different functions. For instance, the ego whose major function is to adapt to reality includes the functions of perception, thought, and motility. All of these functions are important in helping the organism adapt. At times these systems work together, as when one has to use certain ego

functions of perception and thinking in order to fulfill the superego function of doing a good deed. At other times the systems are in an antagonistic relationship as when certain id-dominated needs demand immediate gratification, but reality demands that there be a delay in the gratifying of the needs.

Rather than systems, the arrangement of these functions into specific patterns of functioning, or organizations, that remain relatively stable over time (i.e., take time to change) are called structures. Therefore, according to psychoanalytic theory, structures are theoretical constructs that are defined by their functions. The organism is born with certain structures which are organized on a very simple level. As development proceeds there are more and more complex functional organizations. This process is called structuralization.

Piaget applied his conceptualization of structure to the study of the development of the cognitive structures. In this conceptualization, structure "refers to the inferred organizational properties which explain why this content has emerged" (Flavell, 1963, p. 18). Cognitive development is viewed as a sequence of stages each of which is defined by a different structural organization.

In both psychoanalytic and Piagetian theory structures are inferred from consistent patterns of functioning. The development of these structures is inferred from the gradual change in these patterns

of functioning over time. The present study focuses on these patterns of functioning in the cognitive sphere of the "schizophrenic" child and has attempted to explore the question of whether there is a different structural organization that results in the disturbed thinking of the "schizophrenic" child. The disturbed thinking will be explored through an examination of the children's primary process thinking on the Rorschach.

I would now like to turn to a more detailed examination of the concept of structure in psychoanalytic theory, its history, and the way the changes in this concept influenced the view of the primary and secondary processes.

## Psychoanalytic Theory

### The Energy Concept

Freud's initial theory of man was an instinct theory that emphasized concepts of energy to explain psychic functioning. The concepts of conflict and defense were first understood from this instinct point of view. In order to explain the forces that opposed drives, Freud (1900) hypothesized that there was a self-preservative instinct of the ego that supplied energy for a censorship force that opposed the infantile drives.

The primary and secondary processes, which I will later use as a way of describing the different levels of organization of the thought processes, began by being conceptualized by Freud as energy concepts that described the different ways energy was distributed in psychic functioning. The primary process was characterized by mobile energy, i.e., energy that could be discharged easily through any representation associated with the drive in question. This mobility of cathexis or energy was inferred from the mechanisms of: condensation, a process resulting in the fusion of two or more ideas or images into one; displacement, a shift of emphasis from one mental content to another; and, symbolization, the replacement of one idea or image by another having various formal features in common but disguising a dynamically significant idea (Klein, 1961, p. 181). These were mechanisms of the primary process that had been studied by Freud in his work on dreams (1900).

The primary process obeyed the pleasure principle whose aim was the reduction of tension or unpleasure. For example, when the infant felt an increase in tension such as hunger, he attempted to discharge the tension through hallucinating a tension-reducing object, in this case the breast. Any memory or representation associated with past gratification was acceptable (mobile energy). At this point, the id, which was conceptualized as the source of the primary process, did not distinguish between the memory of an object and

the actual perception of the object; therefore, either was acceptable.

The attempt to reduce tension through the primary process was not effective and resulted in the development of the secondary processes which eventually "come to inhibit and overly the primary ones" (1900, p. 603). This marks the transition from a drive-organization of memory and thought to a conceptual organization of memory and thought.

With the development of the secondary process, which was characterized by bound energy, a distinction was made between the memory of an object and the perception. Bound energy was conceptualized as energy that was invested in mental operations or detour activity, and not in impulsive action or wish fulfillment. The secondary process obeyed the reality principle whose aim was to delay the discharge of energy in order to eventually bring about tension reduction in accordance with reality. The "delayed" energy was detoured into activities that would eventually produce the desired object of gratification, i.e., the hungry baby learned to cry in order to bring the mother who would bring food.

In addition to the conceptualization of conflict, defense and the development of thought, the emphasis on instincts and the concept of energy also determined Freud's view of development. Development was thought of as the shifting of cathexis from one erogenous zone to another which resulted in the different psychosexual stages (oral,

anal, phallic, oedipal, genital). The mechanisms of these shifts were explained in terms of maturation. The content of these stages were the different psychosexual conflicts.

## The Structural Viewpoint

David Rapaport (1960) points out that it was the realization of the drive processes and those forces which conflict with them and remain invariant that gave birth to the concept of structure. Freud's repeated encounterings of unconscious resistances in his patients brought the shift in emphasis from viewing the main division of psychic processes as being whether the processes were conscious, preconscious or unconscious (topographical view), to whether they belonged to the id or the ego (1923), a structural concept. It should be pointed out that Freud rarely used the term structure, but that his concepts of the id, ego and superego laid the groundwork for what was later called the structural viewpoint of metapsychology.

In the 1950s with the emergence of an interest in normal development and with direct work with children (Anna Freud), the ego began to be emphasized as an important center of psychic functioning. Hartmann defined the ego by its functions and was interested in the importance of the adaptive function of the ego for development. This led to the conceptualization of the autonomous sphere of the ego. Hartmann, unlike Freud who believed that the ego developed from the

id and therefore was constantly in conflict with the id for energy, believed that both the id and the ego developed from the same "matrix of animal instincts by a process of differentiation" (Hartmann, 1963, p. 120). Therefore, it was possible for the ego to have an autonomous sphere that was not in conflict with the id. In terms of structural development this meant that the organism was born with certain structures that would eventually be used by the ego and that were important in the maintenance of the organism's autonomy from the drives.[1] From this developed the concept of primary autonomy of the psychic structure, i.e., structures or functions that were not in conflict with the drives. For instance, perception and cognition could be seen as having primary autonomy. In addition, there was the concept of secondary autonomy. This was a concept that described the development of conflict-free functions from what had originally been a conflicted area. For instance, certain defenses which might have begun in response to a conflict become ends in themselves and have become part of the conflict-free sphere of the ego. An example of this was a woman who as a child had developed a reaction formation in the form of protecting her siblings who she resented and wished to get rid of. This role brought its own rewards which after a while

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[1]I will be using the word "structure" although Hartmann uses "apparatus" because they apply to the same concept (Nagera, 1967).

caused the role to be gratifying in itself; it was no longer simply a defense against her own destructive feelings. Eventually she became a nurse.

Hartmann's conceptualization of the neutralization of energy was important in explaining the development of secondary autonomy. Neutralization of energy was conceptualized as a process through which sexual and aggressive energy was transformed to be used in the service of the ego. Development was then seen from an energy point of view as the gradual transition from unmodulated sexual and aggressive energy to neutralized energy that was used in secondary process functioning.

Rapaport (1950, 1951) wrote specifically of the psychic structure and applied the structural model to an understanding of cognition. The development of the primary and secondary processes were seen within this structural context. The core of the change from primary to secondary process was seen as a change in the character of delay. At first the delay was due to external circumstances, but eventually "it is turned into an ability to delay, into an internal control" (1950, p. 164). Rapaport's explanation for the internalization of the control was that when "energy distributions which usually strive for discharge . . . are prevented from doing so . . . (they) structuralize to prevent or regulate their own discharge" (1950, p. 204). Therefore, the shift from primary domination to secondary process domination was seen

as a result of structural development.

Rapaport was the first psychoanalytic theorist to attempt to integrate Piaget's ideas about cognitive development into psychoanalytic theory. He applied the structural model to cognition defining cognitive structures as "quasi-permanent means which cognitive processes use and do not have to create de novo each time" (in Nagera, 1967). In addition, he stated that the criteria for the distinction between the cognitive processes themselves and the structure can be made by the rate of change: "the processes may be defined as showing a high rate of change, the tools and their organization (structures) as showing a low one" (in Nagera, 1967).

## The Primary Process as a Structural Concept

In the 1960s there was still much controversy about whether the primary processes should be viewed as an energy concept (Arlow & Brenner, 1964) or whether the concept should be widened to include all manifestations of the primary processes (Noy, 1969). At this point it was the secondary processes that were seen as the product of the development of structures while the primary processes were seen as existing before there was adequate structural development, i.e., when there was no regulation of drives.

Holt (1967), taking a structural viewpoint, believed that the primary processes as well as the secondary processes were the

result of a systematically organized structure that developed over the course of time. He pointed out that Freud and later analysts' views of the primary process implied a structure, but that it had never been clearly elaborated. His basic point was that one cannot talk about concepts of force and energy whose expression is governed by rules without implying the existence of a structure. To Holt, the central defining feature of a structure was ". . . its organization: it is an arrangement of parts in a pattern, which does not necessarily endure for long, though we are usually most interested in structures that persist for a matter of months or years" (footnote, p. 346). The rules governing primary process, therefore, implied a structure.

In turning from the emphasis on primary process as an energy concept to also seeing it as a structural concept there was a change in the view of the development of primary and secondary process thinking. Holt noted that if one sees primary process as an energy concept as Freud did then one sees it as preceding the development of secondary process thinking since the infant in the beginning of life lives by a tension-reduction model. But, if in turning to the structural concept one sees primary process as a form of cognition, ". . . a system of thinking with autistic or magical as well as wishful properties" (p. 363), then the undifferentiated id-ego stage implies an undifferentiated cognition as well. He believed that ". . . the basic facts of cognitive development," as described by Piaget, "lay the

groundwork for the primary and secondary processes alike" (p. 364).

Holt thought that the development of object constancy which he defined as "the capacity to conceive of an object that is not immediately present in perception" (p. 364), was a crucial event in the development of primary process thinking as well as secondary process thinking. He believed that the "raw material out of which the primary process is fashioned . . . " (p. 366) came from a time before the development of the object concept when "there is a great deal of perceptual fluidity with displacement-like fragmentation and condensation-like flowing of momentary impressions into one another . . . " (p. 366). But it is not until the development of the object concept makes possible the capacity to delay through representational thought that there can be a consolidation of primary process thinking into an organized system of thought that follows its own rules.

> regressivally revived magical procedures, fluidity, and other primary process like aspects of sensory-motor behavior can take on new meaning: they are experienced in the context of a growing coherence and internalization, so they now have the possibility of coalescing into what can plausibly be conceived of as a process, a different system of ideation. (1967, p. 372)

## The Primary Process as a Form of Control

Klein (1970) emphasized the relationship of the primary process as a structured system of thinking to drive regulation. He saw all

behavior as consisting of both needs: "a 'want' of something, a demand for work that pushes the organism to some sort of consumatory behavior" (p. 163); and cognitive controls which were defined as delay mechanisms "that function to resolve an immediate adaptive requirement" (p. 163). He believed that one never sees pure need, but only the way it is expressed through the cognitive controls, i.e., you never see "hunger" but instead the child reaching for a cookie or asking for a cookie depending on how the child has learned to express hunger. Following from this, Klein saw the development of needs and their controls as intimately linked. In an earlier paper he described the development of needs and their controls in structural terms emphasizing their interdependence in development.

> . . . certain structures capable of adapting the organism to the environment are given from the beginning . . . the development of these structures, however, is assumed to be intimately linked to that of drives -- the forces that activate and give momentum to behavior. (p. 183)

Eventually, according to Klein, a hierarchical arrangement of drive-structures develop, i.e., each individual has a whole repertoire, arranged developmentally, of ways to express their needs. The ego was seen by Klein as a hypothetical construct that described the organization of these controls.

Klein felt that the primary and secondary processes were useful in describing the different forms that these controls could take. The

controls could be seen "in the products of thought itself, in forms of cognitive behavior" (p. 171). The primary and secondary processes were conceptualized as resulting from only one set of structures arranged hierarchically that worked on an inhibition-disinhibition paradigm. "Inhibition" consisted of the functioning of the secondary process structures which inhibited the primary process structures from functioning. "Disinhibition" occurred when the secondary process structures were held in abeyance allowing the primary process structures to function. In applying Klein's ideas to children, it should be noted that it is only as children develop that the secondary process structures gradually overlay and inhibit the primary process ones.

Klein, along with other theorists (Holt, 1967; Gill, 1967; Schur, 1969) conceptualized the primary and secondary process functioning on a contimuum. The amount of primary to secondary process functioning depended upon the amount of inhibition or disinhibition of the structures. He drew a distinction between primary process thinking when the structures were intact but not functioning and primary process thinking when there was an actual impairment of the structures.

## The Importance of Superego Formation in Drive-Regulation

Lustmann (1966) believed that although delay, which is at the base of all controls, was usually seen as an ego function, the superego

also plays an important role. This belief grew from his observations of an impulse-ridden child patient of his who showed the development of superego functions along with the development of the ability to control impulses. He felt that the separation of the personality into three separate parts in the structural theory hindered an explanation of the phenomena he had observed in his patient. He saw this phenomenon as "suprastructural" (p. 204) which was explained through Freud's idea of the stratification of the psychic structure: "psychical organization is assumed to be a hierarchical arrangement of structures recognizable by their functions" (1961, p. 183), an idea that Klein had drawn on. The development of impulse control could then be seen as involving a:

> superordinate structure involving a hierarchical stratification of drive derivatives, defenses, with both ego and superego elements having (been) by temporal interaction intertwined on an even higher level. The highest level contains a complex stratification of relationships . . . which function in the control of man when he is at his most mature. (1966, p. 204)

It is through internalization that this regulating structure develops, internalization at its broadest being defined by Hartmann and Loewenstein (1962) as when "regulations that have taken place in interaction with the outside world are replaced by inner regulations" (p. 48). The product of this internalization process is the building

of "restraining structures which are a stratification of both ego and superego components" (p. 215).

## Separation-Individuation and the Primary Process

With the advent of Mahler's theory of separation-individuation (1968) the psychoanalytic view of the development of the primary and secondary process was placed within the context of the growing self-other differentiation of the individual. The child, and later the adult, was conceptualized as an individual in which the way he became cognizant of external reality as well as the way in which internal needs and fantasies were organized and expressed, was linked to the way in which he came to experience himself as a separate human being.

Blatt and Wild (1976) conceptualized the primary and secondary processes within the context of the growing self-other differentiation of the child. They pointed out that a crucial factor in the development from primary process thinking to secondary process thinking was the degree of boundary differentiation. The development of the object concept was separated into four different levels of boundary differentiation which were described as effecting the development of the primary and secondary processes. The first level of boundary differentiation was with the development of object concept which they described as the period in early development when the child

recognizes the mother in different contexts. This is followed by the second level of boundary differentiation which is with the development of object constancy when the child can maintain an internal representation of the mother even when she is absent. This is followed by the third level of differentiation when the object becomes differentiated from its representation, i.e., the child begins to be able to distinguish the mother from his representation of her. The fourth level is with the development of the ability to differentiate the object from its verbal signifier.

Blatt and Wild go on to point out that not only is "the degree of boundary differentiation a crucial factor in the development from primary process to secondary process thinking, but that it is also important in the development of the primary process which goes through a sequence of stages following the changing level of boundary differentiation" (p. 55). As the child becomes more and more differentiated there is a shift in primary process thinking which can be traced in its changing formal characteristics. Later on I will discuss their study (1976) in which they explored the relationship between the different levels of primary process thinking as manifested in the different types of thought disorder and the level of boundary differentiation in adult schizophrenics.

Summary

It becomes clear at this point that the shift from an energy viewpoint of primary and secondary process thinking to a structural viewpoint made possible major modifications and elaborations of the psychoanalytic view of the primary and secondary processes. Freud's description of the mechanisms of the primary process: condensation, displacement, and symbolism, had marked the beginning of the view of the primary process as a system of thinking that developed over time. However, his view of the primary process as an energy concept caused him to conceptualize it as existing from the beginning of life. It was not until the formal advent of the structural perspective that the primary process as well as the secondary process was linked to the development of the cognitive structures which were seen as developing with the development of the object concept (Holt, 1967). In addition, the regulation of drives came to be understood as a complex interaction between the id, ego and superego which were hypothetical constructs that described the different levels of structural organization. These structures were developmentally determined and functioned in a hierarchically arranged psychic structure. Finally, with the growing emphasis on looking at structural development within the context of the growing self-other differentiation of the individual, the formal characteristics of the

primary process were hypothesized as also developing along with the gradual differentiation of the individual.

## Piagetian Theory

Piaget's theory is a structural theory of cognition. According to Piaget, cognitive development consists of the progressive development of structures that enable the individual to "know" reality. Every act of intelligence is governed by some sort of organization, i.e., an underlying structure. The schema is the fundamental structural unit that describes the infant's way of organizing the world and lays the foundation for later cognitive development. It is the structure underlying the infant's overt action and is conceptualized as a "collection of distinct but similar action sequences" (Flavell, 1963). An example of a schema in infancy would be: things-that-are-sucked, or things-that-are-grasped. It is a primitive way of organizing the world through one's actions on it.

This way of organizing the world changes as the child develops cognitively, coming nearer and nearer to what Piaget describes as a dynamic form of equilibrium. Equilibrium describes a "system of exchanges between an open system (cognition) and its surroundings (the environment)" (Ginsburg & Opper, 1969, p. 172) which allows an active state of balance between the organism and its environment to

exist. Piaget divides cognitive development into four stages, each of which has a qualitatively different structural organization which maintains the organism in some form of equilibrium with the environment and each of which brings the organism progressively closer to the ideal form of a dynamic equilibrium. The first three stages are the sensory-motor stage, the preoperational stage and the stage of concrete operations. According to Piaget, in the last stage of formal operations qualitative structural change stops because the structures are organized in such a way that they can maintain a dynamic form of equilibrium.

This adaptation to reality is achieved through the two processes of assimilation and accommodation. In assimilation the child internalizes the experience by modifying it to an already existing schema. In accommodation the child modifies the existing schema to fit in a new experience. An example of these two processes would be when an infant is handed an object he has never experienced before. He sucks it which is an action he already knows. The object has become assimilated to an already existing schema: things-to-be-sucked. He has also had to modify the existing schema to fit in this new experience: things-to-suck now includes a new object. Every action consists of both assimilation and accommodation although their relationship varies. Not only do these two processes take place with environmental events, but internally there is the progressive

coordination of schemata through reciprocal assimilation and accommodation. Things-that-can-be-grasped and things-that-can-be-looked-at become things-that-can-be-grasped-and-looked-at. Development is conceptualized as a progressive organization of schemata through their reciprocal assimilation and accommodation.

## The Four Stages

The infant is born with two characteristics that are important for cognitive development. He is born with physical structures which will limit as well as aid his cognitive development, and he is born with automatic behavioral reactions, i.e., reflexes. The reflexes become modified into the first psychological structures through assimilation and accommodation. In addition, the maturation of the physical structures make available new possibilities for actions that become integrated into the already existing schemata. For example, eye-hand motor coordination makes possible a whole new way of organizing reality by integrating the schemata associated with looking and the schemata associated with grasping.

One way Piaget studied the child's "knowing" of reality was through the way the child comes to know objects. In the sensory-motor stage the object is defined by the infant's actions on it. There is no hard evidence of object constancy at this period of life. This means that the object does not exist separate from the infant's actions;

it only exists as long as the infant is perceptually aware of it. The infant is totally egocentric in the sense that things exist only as long as he physically manipulates them: the "subject conceives of things (only) in relation to his own actions" (Piaget, in Rapaport, 1941, p. 159). He is the center of an action-dominated world.

It is the development of object constancy which is defined as the ability to maintain a mental representation of an object even when it is not physically present that marks the end of the sensory-motor stage and the beginning of representational thought. Object constancy is achieved through "the constant working of assimilation and accommodation" which "gives rise during sensory-motor development to an increasingly elaborate network of interrelated schemata" which "so constituted makes it possible to see objects as things-out-there, independent of one's activity" (Flavell, 1963, p. 63). The more actions the object is "seen" as being subject to, the more likely that it will be seen as separate from the actions, an entity in itself.

The preoperational stage (2-7 years) is a qualitatively different stage of cognitive development. The child has become capable through the internalization of actions on objects and persons to symbolically manipulate reality: this is the beginning of representational thought. In addition, the child is also able to represent objects and persons internally through the symbolic function (Piaget, 1962). The symbolic function develops during the sensory-motor stage

through the process of imitation. The child first imitates the person when the person is present, then there is a period of delayed imitation when the child will imitate after the person has left, and finally there is the internalization of the imitation which results in the symbolic function. With the development of this function there are two types of "signifier," the internalized action that stands for the object or person that is not there. First, there are signs which are signifiers whose meanings are socially shared. Language is a fundamental mechanism of this development. Secondly, there are symbols which are signifiers that are private and idiosyncratic and therefore not social in nature. It is crucial for the development of representational thought that the child be able to differentiate the signifier from what is signified.

As was mentioned previously, language becomes very important as a basic means through which thought becomes socialized. Piaget stresses the importance of social interaction for the development of language and logical thought: ". . . thought becomes aware of itself, able to justify itself, and in general able to adhere to logical-social norms of noncontradication, coherence, etc. . . . all these things and more can emerge only from repeated interpersonal interactions . . . in which the child is actively forced again and again to take cognizance of the role of the other. It is social interaction which gives the ultimate coup de grace to childish egocentrism" (Flavell, 1963, p.

157). It was already mentioned that with the achievement of preoperational thought, there was a decline in action-oriented egocentrism which is an egocentrism in which the child conceives of things only in terms of his own actions upon them. However, there is egocentrisum in the preoperational child on a representational level where the child can only represent reality from one point of view.

Unlike the following stage of concrete operations the preoperational stage is one of comparative disequilibrium. The child ". . . tends to be pulled every which way. His cognitive life, like his affective life, tends to be unstable, discontinuous and moment to moment" (Flavell, 1963, p. 163). His reality is still a series of static and immobile pictures. Thought tends to be extremely concrete and what Flavells calls "preconcepts" are "action ridden, imagistic, and concrete, rather than schematic and abstract" (1963, p. 157). The child when reasoning, tends to focus on one aspect of an event, usually the most perceptually salient one, and then draws a conclusion from this without being able to take into account other aspects of the event and reason logically. The child's thinking is still dominated by the perceptual aspects of the situation, assimilation dominates.

It is not until the next stage of concrete operations (7-12 years) that a cognitive system of logic begins to dominate the perceptual

and static interpretation of events. Schemata internally assimilate and accommodate to each other as well as to the outside world. This results in the actions on objects that were internalized in preoperational thought now becoming integrated into "tightly integrated systems of actions" (Flavell, 1963, p. 165) called cognitive operations. This enables a gradual decentration to take place so that the child begins to be able, both in interpersonal relationships and when confronted with an event, to take more than one point of view and arrive at a "logical" understanding of reality.

What is important to emphasize and what makes this a crucial stage in the child's personality development is that this is the first time there is a fully integrated, coherent cognitive system which the child uses to organize and manipulate the world (Flavell, 1963). Before, the world was seen as a series of static pictures, but now it is seen as a place where perceptual changes take place, but reality, what is known, remains the same (conservation). This is true not only for external reality, but for the way the child conceives of himself (Steingart, 1969). What must be stressed is that parallel with the child's devloping schemata through which he understands the world, he is developing schemata through which he understands himself. During the preoperational stage of cognitive development his view of himself was static and immobile like his view of the world. During the concrete operational stage of cognitive development

there is more stability and flexibility to his view of himself like his view of the world.

The form of equilibrium achieved with concrete operations is not as stable a form of equilibrium as the next and last stage of cognitive development: formal operations (12 years on). It is not until formal operations that the child cuts the final link with domination by perceptual reality and is able to move into the realm of what might be, not just what is. In formal operations there is an integration of the cognitive structures resulting in the adolescent being able to perform operations "upon the results of prior (concrete) operations" (Flavell, 1963, p. 203), and making available to him a structure that will enable him to manage reality and maintain a dynamic equilibrium.

> The adolescent is able to make precise deductions, to extract combinations from a potential or real situation. No longer directed by only concrete relations, he or she can make hypotheses and elaborate theories, distinguish the possible from the necessary, and dissociate the form of thinking from its content and application. (Voyat, 1975).

## Psychoanalytic and Piagetian Theory

This section will use psychoanalytic and Piagetian theory to understand structural development and the regulation of drives, and

will only briefly do a formal comparison of the two theories (for a more extensive comparison see Silverman, 1971). By structural development I mean the qualitative changes in the underlying organization of psychic functioning that occurs during development. Cognition, as described by Piaget, will be viewed as being an important indicator of the level of structural development and as having a crucial role in the regulation of drives.

## The Development of the Psychic Structure and its Effect on Cognition

It becomes clear in reading psychoanalytic theory that there is no single way of viewing any psychoanalytic concept. Therefore, for the sake of clarity, I will summarize what I am referring to when using the term psychic structure. The psychic structure consists of the id, ego and superego which are theoretical constructs that describe three different levels of structural organization that are developmentally determined, i.e., each structure evolved from a different period of development which determined the way it functioned. The three structures are not separate but exist along a continuum. Drive regulation occurs through their complex interaction. Klein (1970) postulates that their functioning is determined by the amount of inhibition or disinhibition of the structures.

The primary and secondary process describe the shift from an id-dominated or drive-dominated organization of thought and memory

to the ego-dominated or reality-dominated organization of thought and memory, i.e., they are used to describe the different levels of organization of the thought processes. In modern psychoanalytic theory every act is seen as consisting of both primary and secondary process thinking. These processes are conceptualized as on a continuum (Gill, 1967; Schur, 1969).

Since Piaget was tracing the development of the cognitive structures, he focused on one area of psychic functioning, cognition, and traced how this area changed. From a psychoanalytic perspective one could say that Piaget was tracing the effect of the development of the different psychic structures of the id, ego and superego, on cognition. Therefore, it is not surprising, that one can see many similarities between Piaget's description of the different stages of cognitive development and the psychoanalytic view of id-dominated cognition: the primary process, and ego-dominated cognition: the secondary process.

First, there are striking similarities between the mechanisms of primary process thinking: condensation, displacement, and symbolization, and Piaget's description of the preoperational child's thinking which Silverman describes as being:

> . . . characterized by rapid, easy shifts from one attribute to another as a criterion for association and categorization, condensation of elements into unstable, jerry-built images that loosely coordinate them, poor distinction

> between part and whole, simultaneous existence of mutually contradictory beliefs, and a highly fluid imagery that is close to concrete perceptions. (1971, p. 337)

Therefore, one might conceptualize the preoperational child as showing predominately id-dominated thinking in terms of the formal characteristics of its thought process.

Secondly, secondary process thinking with its more accurate appraisal of reality and growing autonomy from the drives can be seen as similar to the development of operational forms of thought where the gradual internalization of a system of actions on objects allows the child, and eventually the adult, to transcend the immediate perceptual reality. One difference is that Piaget emphasizes autonomy from external reality (perceptions) while psychoanalytic theory emphasizes autonomy from internal reality (drives). In both systems, however, it is the development of the cognitive structures that makes this autonomy possible. One might summarize this development by saying that as children become operational they show the effect of ego development in the domination of secondary process thinking over primary process thinking.

## Drives in Psychoanalytic and Piagetian Theory

Before going any further an important difference in emphasis between psychoanalytic and Piagetian theory must be explored. Both the psychoanalytic and Piagetian approach to the relationship between

structures and drives differ because of the different roots from which the two theories emerge. One of the main interests of psychoanalytic theory, which began with the study of pathological behavior, was in the organism's ability to control instinctual drives. With the change from an instinct base to a structural base, structures were seen as the entities that grew to be able to control and channel these drives (Rapaport, 1950, 1951). Piaget, on the other hand, does not address the issue of drives and structures in the same way. He is interested in what Hartmann would call the conflict-free sphere of psychic functioning (1958). His interest in normal development caused him to see drives as having a more positive, motivating and energizing force in behavior. His ideas are more congruent with Klein's (1970) description of "needs" as having a focusing effect rather than a distorting effect. This difference in emphasis effects the different conceptualizations of conflict in both theories. The conflict that Piaget is interested in is not between the instincts and reality as in psychoanalytic theory, but between the internal representation of reality and the external reality, i.e., cognitive conflict.

Following from the difference in emphasis, Piaget's description of the different stages of thought omits how the drives are expressed or modulated by the development of the cognitive structures. Therefore, his description of preoperational and operational thought merely describe the structural aspects. It is psychoanalytic theory that

relates the formal aspects of primary process thinking: condensation, displacement and symbolization, to the drive content of unmodulated sexual and aggressive wishes. With operational thought Piaget's interest is in the positive effect that social interaction has on the development of logic, while psychoanalytic theory goes one step further and describes how the development of the logical structures aid in the modulation of drives.

## The Role of Cognition in the Regulation of Drives

Since the main purpose of this study is to understand the structural development of schizophrenic children in which there has been a problem in the development of the ability to regulate drives, I would like to explore in greater detail the role of cognition in this area.

The first step in structural development is with the capacity to delay which is made possible by the beginning of representational thought. The infant no longer has to act on objects (Piaget) nor discharge tension immediately (psychoanalytic theory). Instead, the ability to represent actions internally, which occurs with the beginning of representational thought, makes possible what Rapaport (1950, 1951) calls "detour" activities and the beginning of secondary process thinking. The infant is able to channel his actions in other ways beside immediate and direct expression. Psychoanalytic theory would describe this as the reality principle beginning to hold sway over

the pleasure principle.

This new ability marks the differentiation of the ego, a level of structural organization that begins with the internalization of controls. The infant no longer is so dependent on the external world for these controls. Instead, he has internalized these controls and is more able to regulate drives as well as adapt to reality. The id as a center of psychic functioning also develops at this point. This is inferred from the beginning of primary process as a system of thinking (Holt, 1967).

Both psychoanalytic and Piagetian theory agree that the main mechanism of this structural development is the process of internalization which is described in Piagetian terms by the assimilation-accommodation paradigm. Lichtenberg and Slap (1971) point out that the nature of the internalization process depends on the level of cognitive development. This can be seen in the process of internalization that takes place during the sensory-motor stage of cognitive development. During this period it is the internalization of actions on objects that results in structural development. During the oedipal period the process of internalization becomes more sophisticated because of the change in cognition (Lichtenberg & Slap, 1971).

> The introjections and identifications which take place are dependent for their regulatory possibilities on the maturation and development of cognitive apparatuses accomplished at this time. Thus, internalizations of the oedipal period are qualitatively different in their content

> and in their sophistication as regulatory guides because of achievement in time-space, organizing and synthesizing capabilities. (p. 455)

## Operational Thought and the Stabilization of Psychic Functioning

Steingart (1969) expresses a more specific belief that it is with the achievement of the operations of conservation and reversibility that an overall structural integration occurs that has not existed before. This structural integration results in the internalization of those psychic functions that are categorized as superego functions. Steingart understands the id, ego and superego not only to be ways of classifying functions, but also as concepts that are used to "classify different types of identifications which produce important differences in psychic content (experience)" (p. 271).

He views the structural integration that occurs at this time from the point of view of character formation. Character is defined as the "presence of a kind of strategy for the use of psychic functions . . . (as) the presence of an organizational principle" (p. 280). He agrees with Freud (1933) and other psychoanalysts that the process that produces the influence of the superego function is the process of identification. In order to explain this process he applies Piaget's view to "self-representational learning," a process through which one's way of viewing oneself is learned. Before the operations of conservation

and reversibility are achieved there are many different self-representations or identifications that are not as yet integrated. It is not until latency and the achievement of conservation and reversibility:

> that an advance in self-representational learning takes place, and that the result for identification formations is akin to this more general advance in symbolism. This means that typically a child at some point in middle latency forms a basic sense-of-self which possesses both self-conservation and self-reversibility. All particular identifications are now integrated and therefore experienced as reversible aspects of this basic sense-of-self. (p. 285)

This development results in an overall identificatory structure which provides an "integrated evaluative frame of reference for all other identifications" (p. 287). The structural integration that is achieved and the formation of the superego ego-ideal is extremely important for stabilization of psychic functioning. In particular, Lichtenberg and Slap point out that the internalization of the superego is important for the defensive organization.

> The consolidation of the superego after the oedipal period has a stabilizing effect on the defensive organizations. It then settles to its principle function: to be the major ego resource working to achieve a smooth functioning, relative autonomy from the drives, external environment and the superego. (1971, p. 30)

## Conclusion

In conclusion, one can say that as the different psychic structures form and evolve they have a definite impact on the thinking of the child. In psychoanalytic theory the different levels of the organization of thought are described as the primary and secondary process and are similar to Piaget's description of preoperational and operational thought. These different levels of structural organization and the associated forms of cognition have an important impact on the organism's ability to regulate drives and understand reality. As development proceeds cognition and the child's ability to "know" the world becomes less and less dominated by the immediate stimuli, whether it be the internal stimuli of hunger or the external stimuli of an intense perceptual impression, and more and more determined by the ability to think and reason abstractly. The integration of operations that occurs with the concrete operational stage of thinking and the development of the superego-ego ideal seem to play an important role in the stabilization of psychic functioning that occurs during latency.

# Part 2:

# Empirical Studies

## The Structure of Thought in Normal Development

Eventually I will explore the structural organization of the latency-age psychotic child through an exploration of his thought processes. But in order to understand how he differs from the normal latency-age child it is necessary to look at some aspects of normal development, especially those aspects that can be most confused with symptoms of pathological development. This section will look at the relationship between the development of cognitive structures as described by Piaget and the development of primary process thinking in normal development. In particular, I will focus on the manifestations in normal development of those components of primary process thinking that eventually come to be seen as signs of pathological thinking.

### Cognitive Development and the Primary Process

Safrin (1974) looked at the development of primary process thinking using Holt's (1970) method of scoring the Rorschach, and cognitive development using Piagetian tasks in three groups of children: an oedipal group (4-5 years), a latency-age group (8-9 years) and an adolescent group (13-14 years). There were twenty-one subjects in

each group of normal children. Primary process was viewed as being manifested in both the content and structure of the thought processes. She found that (1) the proportion of primary process containing unsocialized, blatent material decreased with cognitive development while (2) defense effectiveness increased. There were two unexpected findings. Her hypothesis that the blatent primary process would be lowest at latency was not supported and another hypothesis that there would be an increase in varieties, but not in quantity of formal thought deviations with development was also not supported. Instead, she found that there was a decrease in logical thinking errors as well as an increase in primary process content, i.e., it was socialized but the primary process themes were there. The decrease in the logical thinking errors included a shift from more perceptual deviations in thinking in the earlier years, for example the putting together of two incongruous precepts (see Rapaport, Gill, & Schafer, 1968), to more ideational deviations in thinking in later years, for example the use of symbolism.

When Safrin redrew the oedipal sample using only the four year olds she found that the significant increase in primary process content decreased and the increase in the "ideational" aspects of deviations in thinking were not as striking. She explained this shift in results as being due to the five year olds already having the oedipal period and therefore being in early latency, while the four

year olds were still in the midst of the developmental conflicts of the oedipal period. The fluctuations in the content and expression of the primary process was due more to the presence or absence of the developmental conflict and the resulting need or lack of need for controls rather than the children's structural capabilities. Therefore, once having excluded the more restricted children (the five year olds) there was less of an increase in primary process thinking. However, she did feel that with a properly drawn adolescent sample there would be a significant increase in the more ideational aspects of primary process thinking as compared to the younger children.

In contrast to this study, Matalon (1974) using 56 ten-year-old children to whom she gave the Rorschach (Holt's scoring system) and Piagetian tasks, found no correlation between good cognitive functioning and well-defended primary process. Matalon's conclusion was that the primary and secondary processes and cognitive development as measured by Piagetian tasks were two autonomous systems that did not overlap. This contradicted Safrin's findings that the parallel development pointed to an overlapping of the two systems. However, her findings on the type of formal deviations found in the thought of latency-age children were in agreement with Safrin's findings. There was an absence of symbolism and the presence of more perceptually based errors in logic.

Wulach (1976) pointed out that Matalon's findings that the primary

process organization and cognitive organization did not overlap might be explained by the narrow age-range of her population which would not sufficiently differentiate the children cognitively and therefore not make it possible to compare their cognitive scores with the measures of primary and secondary processes. In addition, it seems quite likely that in normal development these two systems have become autonomous by latency although their development was interdependent. It would only be in abnormal development that one would see the lack of this autonomy. Dudek's (1972) findings that once children have achieved concrete operations there is no correlation between emotional maturity and cognitive development would support this hypothesis.

Both Safrin's and Matalon's findings of the presence of perceptual deviations in the thought of normal latency-age children were not in agreement with Ames' (1974) findings that from four to five and a half years is the height for "odd combinations," i.e., contaminations, confabulations, fabulized combinations, but that by the age of six years these responses have almost disappeared. She found only five responses of this sort out of 250 records in the 6-10 year old group. Before four years of age there are very few of these deviations. It is unclear what caused this discrepancy in the findings.

Wulach (1976) continued the exploration of the question of the relationship between the development of cognitive structures and the development of primary process thinking. He used thirty-seven

subjects five to eight years old and compared their functioning on Piagetian tasks. He found a positive correlation between cognitive development and the socialization of primary process thinking. In addition, he found that both cognitive and primary and secondary process thinking develop along a continuum. The findings were regarded as evidence of underlying cognitive structures which resulted in these correlations.

## Boundary Differentiation and the Primary Process

Blatt and Wild (1976) looked at primary process functioning from a developmental point of view in a study of adult schizophrenia. They divided the different types of thought disorder according to those which showed the most boundary differentiation such as fabulized combinations in which there is the incongruous joining of two precepts, to those that showed the least boundary differentiation such as contaminations in which there is a fusion or partial fusion of the precepts. They then divided the patients according to what types of thought disorder they showed in their Rorschach protocols. They found that patients usually exhibited only one type of thought disorder and that there was a relationship between the severity of the disturbance as measured by the diagnosis and the type of thought disorder: the more disturbed patients tended to show more undifferentiated types of thought disturbance. Occasionally, a protocol would show all three types of

thought disorder, but it was unusual for a record to show responses from only the two extremal end of the boundary continuum. They interpreted these findings as evidence for "a thought disorder continuum based on degrees of disruption of boundary articulation" (p. 62).

Superego Development and the Role of Cognition

There is some slight evidence that supports the view that the overall integration of cognitive functioning that occurs with concrete operations is important for the internalization of the superego (Steingart, 1969) and smooth psychic functioning (Lichtenberg & Slap, 1971).

Dudek (1972) did a longitudinal study of sixty-five normal children over a four-year period from kindergarten to second grade. She used Piagetian tasks, the Rorschach, the WICS, and a personality questionnaire to extract the relationship between Piaget's developmental stages and emotional maturity. She found a positive correlation between ego and particularly superego factors and Piagetian test scores. Children who reached operational and causal thinking were also more mature and emotionally stable. The empirical evidence, however, did not clarify which development came first. These findings were supported by a previous study by Goldschmidt (1968) who found a positive correlation between the level of conservation and the child's emotional growth.

The Role of Conflict in Cognitive Functioning

There were some other findings of Dudek's (1972) that are interesting in light of the studies done on cognitive development of psychotic children that will be discussed later. Dudek became interested in the children she called "high regressors." Regression was defined as the number of cognitive regressions at any level over a three year period. Apparently, she was not talking about transitional children, but children where there was a slight instability of stage acquisition. The high regressors (16/65) had three or more regressions over the three-year period; the low regressors (9/65) had none; and the rest of the children were intermediate with from one to two regressions over the three-year period.

In her discussion of these results Dudek focused on the high regressors who showed high Piagetian tests and good I.Q.s and good Rorschachs. This grouping showed definite personality traits that differentiated them from the others. They showed a cautious, concrete approach to the Rorschach that was linked with obsessive-compulsive traits. They were viewed as children who needed to keep tight controls. Dudek hypothesized that:

> The tendency to regress to lower levels of thinking reflects the persistance of conflict between id and superego . . . which appears to result in the strengthening of obsessive-compulsive defenses in a basically intelligent and imaginative child to a point where the price is paid . . . in terms of emotional freedom and

> spontaneity (as far as can be judged by the Rorschach). (1972, p. 477)

Therefore, continued conflict between id and superego functioning in normal children can result in a slight vulnerability to cognitive regression. Dudek's findings would also conform to Safrin's view that the presence of conflict in normal children, in the case of Safrin's population developmental conflict, can have an effect on the functioning of the thought processes although not the structure.

## Summary

According to the previous studies (Safrin, 1974; Matalon, 1974; Dudek, 1972), the typical latency-age child is a child whose thinking contains a high amount of primary process material that is expressed in a socially acceptable way. He shows good defense effectiveness. Although there is disagreement on how frequently the formal aspects of primary process thinking do occur (Ames, 1974 versus Safrin, 1974) it does seem clear that when there are deviations, the older the child the more likely these deviations will be ideationally based rather than perceptually based. But what do these studies add to our understanding of the relationship between the development of the cognitive structures and primary and secondary process thinking?

By looking at primary process thinking in terms of its structure as well as its content, Safrin (1974) is in agreement with Holt's view that the primary process as a system of thinking only occurs with the

development of object constancy. In addition, there seems to be some evidence that there is a relationship between the formal characteristics of primary process thinking and the degree of boundary differentiation (Blatt & Wild, 1976). In looking at the difference between the four and five year olds' functioning on the Rorschach, Safrin (1974) makes the point that secondary process thinking becomes established during the oedipal period but that the stabilization of functioning according to this process does not occur until after the oedipal conflicts begin to subside. Conflict, therefore, in normal children can be viewed as having a role in delaying the stabilization of secondary process thinking. This view would mean that the development of cognitive structures are necessary for secondary process thinking to occur (Wulach, 1976; Safrin, 1974) but not sufficient. One way of looking at this is that the development of the operations that eventually evolve into the qualitatively different system of thinking of concrete operations, bring with them certain developmental conflicts. For example, the flexibility that occurs with the operation of reversibility makes possible the ability to see people in different relationships to each other. The child has to integrate this new way of seeing his relationship to people into his inner world. To simplify a bit, he has to go from seeing himself as the center of his mother's world and the center of his father's world to seeing that his mother is both his mother and his father's

wife. It is not until the conflicts that this new way of representing the world brings about are resolved that a stabilization occurs that will result in smooth psychic functioning and the domination of secondary process thinking.

The last point I wish to make is that it seems that the cognitive structures that are so important in secondary process thinking are also important in the development of the primary process thinking. The primary process makes use of the available cognitive structures. In younger children you have the predominance of the perceptual mechanisms of the primary process (Safrin, 1974) while in older children the more ideational mechanisms such as symbolism are used more frequently. Therefore, it seems that the primary process as a system of thinking is not a static system but in normal development it continues to grow and change along with the developing cognitive structures.

## Structural Organization of Psychotic Children

Michael Rutter (1972) has pointed out that a major problem in looking at the different pathologies of childhood is that:

> The diagnostic situation can only be described as chaotic. Clinicians from different centers use the same term to mean different conditions and different terms to mean the same condition. (p. 315)

Although I will specify the diagnostic category of the children in each of the following studies, it is important to keep in mind that the criteria of diagnoses for these studies is so inconsistent that one cannot assume that the same diagnostic means that we are looking at the same pathological entity. I will attempt to emphasize in the following review the different structural characteristics of the children which I think in the end will result in a more consistent way of categorizing them. Therefore, I would now like to examine the empirical studies that have attempted to understand the underlying structural organization of psychotic children. The major ways that structure has been studied in these children is, first, in terms of ego development and more recently in terms of cognitive organization.

Ego Development

Freud first raised the possibility in 1911 that psychosis is connected to a problem in ego development:

> We can no more dismiss the possibility that disturbance of the libido may react upon the egoistic cathexis than we can overlook the converse possibility -- namely, that a secondary or induced disturbance of the libidinal process may result from abnormal changes in the ego. (1911, p. 461)

This conceptualization was elaborated with the advent of ego psychology. Theorists began to focus more on ego development and its effect on the expression of libidinal and aggressive drives.

David Beres (1971) pointed out the importance of not only looking at the child's fixation level in terms of sexual instincts, but also in terms of ego development.

> We must discover in each case the "general fixation level" of the ego as well as the infantile instincts . . . the final infantile level of ego development in the schizophrenic constitutes a base line, regression to which will, given any excess of excitation, disrupt the faculty of reality proving. (1971, p. 22)

Childhood psychosis has been viewed by psychoanalytic theorists and researchers as impairment of ego functioning. Beres described different psychotic children as differing according to which ego functions are impaired. Other studies emphasize the tremendous variability of abilities within each child (Cain, 1966). At times a pseudo-precocious development of certain functions is seen with a parallel inhibition of other functions (Vereecken, 1965).

Schulman (1953) linked problems in thinking with impaired ego functioning. He studied a small sample of ten psychotic children who ranged from seven to fourteen years of age and were of average intelligence. Certain shared tendencies in their thinking, in particular a tendency to stick to the "reality aspects of objects" (p. 15), became apparent in a study comparing their thinking to a similar study that had used normal children. There was a tendency toward the narrowing of concept span at all age levels, almost complete

absence of abstract conceptual definitions and instead the use of concrete concepts. Unlike adult schizophrenics the children did not show syncretic responses (over-generalization) which he hypothesized was due to their lack of adult cognitive development. They also showed the presence of symbolic responses which he described as the using of objects for arbitrary symbolic interpretation. Schulman reported that there was no evidence of developmental trends although it seems quite possible to this author that the small number of his population is responsible for these results. He concluded from this study that ". . . the presence of an impaired ego in schizophrenic children prevents their adequately understanding the relationship of environmental objects" (p. 15).

But what does the term impaired ego functioning mean? As has been previously discussed one cannot talk of functions without implying the existence of structures. One point of view is that it is the underlying structure that coordinates and organizes the ego functions that is disturbed. Winnicott (1945) wrote of a regression to a "primary unintegration" which corresponds to a loss of the synthetic function of the ego (Nunberg, 1931). Beres (1971) equated this function with Piaget's description of the function of organization and described it as one of the functions that can "go awry" in childhood psychosis. The preceding descriptions seem to point toward childhood psychosis being associated with problems of structural development.

## The Different Structural Organization of the Borderline and Psychotic Child

The concept of problems of organization in structural development in psychotic children has become elaborated and differentiated in the literature on the distinction between the borderline and psychotic child. Fred Pine (1974) summarized the literature on the borderline child in an article in which he pointed to a continuum ranging from psychotic to borderline that excluded Kanner's autism, Mahler's symbiotic psychosis, and childhood schizophrenic which he conceptualized as a regressive phenomenon. He classified the remaining children into two groups depending upon the amount of internalized pathology. One group includes those children who were reacting to a disturbed environment but had not yet fully internalized the pathology. The other group were those children in which the pathology had become an integral part of their structure; they had not achieved a stable hierarchy in terms of drive, ego and object relations development. They showed a consistently "mixed bag of varying levels of ego function, drive level, and object relationship" (p. 349). These deficiencies which were always present created a "chronic ego deviancy," a term he used to label this group (p. 349). A subgroup of this category was Ekstein's borderline children who are described as having two levels of ego organization rather than a lack of organization (1954, 1966). The more primitive level of organization

achieved is used defensively, the child regressing to it when confronted with a reality that is too conflictual.

More recently, Meyer and Caruth (1964) in an article on the use of the Rorschach made a distinction between inner and outer reality testing in order to explain the fluctuations in functioning of the borderline patient. According to Meyer and Caruth, the borderline patient has good external reality testing: the process of perceiving external reality, but poor internal reality testing: the ability to evaluate realistically the accompanying fantasy to the external reality. The borderline patient can function appropriately as long as the external reality does not impinge on his inner world. When this impingement occurs there is an inability to distinguish between the inner and outer reality and there is a regression to "psychotic" functioning. To summarize, the borderline child is usually described as having a structure that allows for these fluctuations in functioning.

On the other hand, there is the possibility that the children that Pine leaves out of this classification -- Kanner's autism, Mahler's symbiotic psychosis, childhood schizophrenia -- have a different underlying structural organization. It is also possible that they differ from each other in terms of their structural organization. Goldfarb (1961) postulated that an underlying problem in the population he studied was an inability to give "patterned form to both inner and outer experience . . . " (p. 103) which affected the child's sense of

identity and self-awareness. Halpern (1953) also points to problems in identification being one of the common factors in schizophrenia. It is as if some central part of development has never taken place in the psychotic child and rather than functioning at a high level which fluctuates at times of stress as in the borderline child there is a more low-level, homogeneous functioning.

Cognitive Functioning (Piagetian) of Psychotic Children

The few studies done on the cognitive organization of psychotic children parallel in many ways the studies done on the ego functioning of these children. One of the few findings has been of the variability of the application of cognitive operations to all areas of cognition. Halpern (1966) did a clinical study of an adolescent she saw in psychotherapy. She found that although his I.Q. increased considerably in the course of treatment so that at the time of administration of the Piagetian tasks he fell within the average range of intelligence, he showed tremendous variability in his cognitive functioning. In certain tasks he was preoperational while in others he was concrete operational. She described these findings as his showing a developmental lag in the concepts of causality and life and difficulties in the ability to use age-specific inferential judgment.

Schmid-Kitsikis (1973) used fifty children diagnosed as psychotic from 7 to 12 years of age. Her focus was on the process of compensa-

tion that occurs (regulations) when there is a disturbance in the environment which results in disequilibrium. In order to achieve equilibrium it is necessary to compensate for the disturbance which in normal development results in the evolution of the cognitive structures. When the psychotic children were confronted by a "disturbance" in the reality, i.e., a cognitive conflict, rather than attempting to accommodate cognitively to the new reality they attempted to change the reality which negated the conflict. An example of this was in the attempt to change the experimental material whenever possible. One way was to make the objects identical in order to deal with perceptual discrepancies. In conservation of matter they tried to change the sausage-shaped clay back to a ball to match the other ball of clay. Schmid-Kitsikis described this as "the existence of procedures having as main characteristics the conflict avoidance and reality transformation mechanisms" (p. 703). Schmid-Kitsikis believed that these "basic avoidance and reality transformation mechanisms" showed a "fundamentally affective need for non-contradiction" (p. 703). Similarly, the constant oscillations in reasoning also showed the subjects' difficulty in apprehending cognitive realities "without the intervention of affective elements (insecurity, participation and so forth)" (p. 703). She concluded that this inability to deal with cognitive realities without the intervention of affective elements and the resulting need to use reality avoidance and transforming

mechanisms was one explanation for why "no regulations characteristic of a progressive construction process totally compensatory of disturbances are obtained and why there is no integration process" (p. 703).

Besides examining the regulations that the children used, Schmid-Kitsikis also looked at the more static structural aspects of their functioning. She found, similar to Halpern (1966), that the children's main difficulty was in applying the cognitive operations they had achieved equally to all areas. The areas most difficult were those in which perceptual transformations took place.

> Their thought processes remain dominated by subjective cues in as much as the situations imply transformations of the physical aspects of objects. In certain cases, as in the conservationa notions, this is demonstrated by acquisitions remaining developmentally at a half-way stage or continually oscillating at all levels. (1973, p. 702)

Shackelford (1975) studied 10 psychotic boys eight to ten years of age of average intelligence. She found three different groups of children. Twenty percent had achieved concrete operations, fifty percent showed both preoperational and concrete operational thinking which was similar to the children in the Schmid-Kitsikis study, and thirty percent were preoperational. The children who demonstrated both preoperational and concrete operational thinking were different from normal transitional children. They did not achieve concrete

operational thought in the same succession of domains as Piaget had found and no other order was found. This differed from the Schmid-Kitsikis findings of logical domains being easier than areas in which perceptual transformations take place. Shackelford described these "transitional" children as showing a "lack of organization." An exploratory study carried out by Voyat and including this author found similar results to Shackelfords with the children falling into preoperational, "transitional," and concrete operational groups. The tendency of the "transitional" children was to have difficulty with problems in which perceptual transformations took place. In some cases it seemed that if the perceptual aspects of the task were too intense, for instance a color, the child was unable to apply cognitive operations that he might be able to apply in other situations. An additional or alternate way of describing this variable functioning which Shackelford described as a "lack of organization," would be to describe it as a fluctuating organization which is easily disrupted.

Shackelford also explored the nature of the children's responses. She examined the possibility of a thought disturbance and its relationship to the cognitive organization. In analyzing the process of reasoning of the "transitional" child she described the child as resorting to "unusual responses" when confronted by a cognitive conflict. For example, the child would attribute magical powers to the examiner or the material rather than using logical

or prelogical justifications. Shackelford wondered if under more stressful circumstances these "unusual responses" might manifest as a thought disorder and she hypothesized that those children who had not reached concrete operations were more vulnerable to evidence of a thought disorder than those who had reached concrete operations and therefore a more consolidated structure.

The last of these studies to be discussed is one by McLaughlin (1976) in which she used two Piagetian tasks, one-to-one correspondence and classification, with emotionally neutral and emotionally evocative objects, in order to see how the emotional content of the objects effected cognitive functioning. .Her population consisted of eleven children diagnosed as psychotic with an average age of 10-4.

In agreement with past studies (Schmid-Kitsikis, 1973; Shackelford, 1975), McLaughlin found that the normal succession of domains described by Piaget did not hold for her sample. Also in agreement with past studies (Schmid-Kitsikis, 1973; Shackelford, 1975), she found that only two children were able to do both classification and one-to-one correspondence although all of them should have been able to. And even when these tasks were achieved the justifications that were used were more likely to be concrete than abstract, the abstract justification being the appropriate one at this level of cognitive development. Another finding was that there was a positive correlation between the achievement of one-to-one correspondence

and their reality testing which was determined by the children's answers to questions asked at the beginning of the test. Finally, McLaughlin's hypothesis that the children would perform more competently with objects they liked or felt neutral towards was not supported. Instead, she found that the children who clinically appeared to be at the autistic end of the continuum seemed least affected by the meaning of the material, while the more "cognitively advanced, reality connected children" had more difficulty with the "potential symbolic properties of the material" (p. 158).

In her qualitative analysis she divided the children into four groups. The first were those children who had achieved both one-to-one correspondence and class inclusion, but whose justifications were not up to what one would find in a concrete operational child. The second group were those children who had achieved one-to-one correspondence but not class inclusion. Here there was a delay but otherwise the findings were in agreement with Piaget. Both these groups showed some "tricosmic structure," a term McLaughlin used to describe the period of development that begins with the perception of self in relation to more than one object. The third group of children could do neither task and the fourth group had achieved class inclusion but not one-to-one correspondence which was in disagreement with Piaget's findings for normal development. McLaughlin observed that the fourth group of children had visual-spatial integration deficits

that prevented them from transcending perceptual transformations in one-to-one correspondence. They also seemed to be what she described as "unicosmic" a term used to denote the earliest period of development when there is little differentiation between the self and the object world.

## Normal and Pathological Thinking in Psychotic Children: The Development of the Primary Process

In the section on normal development I emphasized the development of primary and secondary process thinking. The primary process was described both in its formal or structural aspects and its content. One question to be asked is how the thinking of psychotic children compares in this respect to the thinking of normal children.

Unfortunately, the studies that have been done on primary process thinking in psychotic children have been few and were done with adolescents. Silverman (1962) studied 40 adolescents ranging from eleven to eighteen years of age who lived in a residential treatment center. He divided these adolescents into two matched groups: twenty were diagnosed as schizophrenic and twenty were diagnosed as psychoneurotic or personality disorders. He analyzed their Rorschach protocols for primary process using Holt's method of scoring. He found that although primary process thinking was not as blatant as he thought it would be, it still differentiated the schizophrenics from the psychoneurotics and personality disorders; in fact, it was a

better differentiator than the form level of their responses. He hypothesized that the schizophrenics being capable of functioning within a residential center and the psychoneurotics being incapable of functioning on the outside was responsible for the narrowing of the gap between the functioning of the two groups.

Greenberg (1971) did a longitudinal study of a prepsychotic adolescent (fourteen years old) who was in psychotherapy. Although there was hardly any clinical evidence of change as measured by a psychiatric rating over a three-year period, the analysis of the Rorschach using Holt's method of scoring (1970) did show some reduction of drives, i.e., some change toward more socialized primary process content and a shift from "impossible combinations" to "unusual combinations." Greenberg described the only slight change in the patient's scores and functioning as being to the patient's inability to deal with aggression which resulted in the use of psychotic regression as a defense.

There have also been a few studies that have become more specific on the types of deviations in thinking that the psychotic children show and that can be used to compare to the studies of thinking in normal children.

Cobrinik and Popper (1961) studied thought disturbance from a developmental point of view in forty-eight schizophrenic boys, 7-1 to 13-11 years of age, by analyzing their Rorschach protocols. They

looked at the quantity of the thought disturbance and found that twenty-five children demonstrated some form of disturbance while twenty-three did not. There was a significant relationship between the age of the child and the occurence of the thought disturbance. While six out of seven children at eight years of age manifested a thought disturbance, the proportion became roughtly equal between the ages of nine and twelve and then dropped off sharply after thirteen years of age. Only two out of ten children in the thirteen-year-old group showed any sign of disturbed thinking. In addition, Cobrinik and Popper found a significant relationship between the amount of primitive fantasy material in the Rorschach and the amount of thought disorder. They also looked at the relationship between age and the type of thought disturbance. The category of thought disturbance was divided into: (1) fluidity: vague, rapidly shifting perceptions; (2) combinatory thinking: the bringing together of two incongruous precepts; (3) contaminations: the combining of separate precepts or ideas into a single response; (4) confabulation: the building up of a response in a poorly reasoned way, often based on a small detail having some individual significance to the child; and (5) illogic. (For a more detailed description of the forms of thought disturbance, see Cobrinik & Popper, 1961, pp. 173-174.) Their findings were that the eight year olds showed the greatest fluidity while the combinatory category showed a sharp decline after eleven years of age. The

remaining categories (contaminations, confabulations and illogic) did not show a specific age-related pattern.

In summary, these studies seem to show that children diagnosed as psychotic will tend to have more blatant, unsocialized primary process material than those children who are not psychotic. There is some evidence that in some psychotic children the structure of the primary process thinking (type of deviation) is at the appropriate developmental level but much greater in its amount than is normal while in other psychotic children the structure of the primary process is at an earlier developmental level. One factor that may account for the different types of deviations found in the psychotic children's thought processes may be the level of cognitive development (see the discussion of primary process as a developing system of thinking, p. 13).

## Part 3:

## Summary and Hypotheses

In reviewing the literature it became clear that the diagnostic category of "childhood schizophrenia" covers a wide number of syndromes as well as a variety of etiologies. I have chosen to organize and look at the behavior and thought of children diagnosed as "schizophrenic" from a structural point of view. In order to do this Piagetian tasks and the Rorschach were used. The hope was that these tools would help to (1) delineate the different structural organizations of these children, and (2) tell us more about the relationship between these different structural organizations and the children's "schizophrenic" thinking and behavior.

### Cognitive Functioning

#### Cognitive Organization

The first part of this study attempted to verify those studies done on the cognitive organization of children who had been diagnosed as schizophrenic and who chronologically should have reached a concrete operational level of thought (Schmid-Kitsikis, 1973; Shackelford, 1975; McLaughlin, 1976).

According to these studies "schizophrenic" children who should have achieved a concrete operational level of thinking, instead, fall

along a continuum from those children who are predominantly at a preoperational level of thinking to those children who are at a concrete operational level of thinking. The greatest cluster appears to be those children who fall somewhere in between and function at different cognitive levels in different cognitive domains, i.e., they might be at a concrete operational level in a task of classification but preoperational in a task of conservation. I have referred to this group of children as the "heterogeneous group" to differentiate them from the preoperational and concrete operational group who show a more homogeneous level of functioning. There is some dispute in the literature over whether within the heterogeneous group there are distinct subgroups who show a different cognitive organization (Schmid-Kitsikis, 1973; McLaughlin, 1976) or whether the heterogeneous group simply shows a lack of organization (Shackelford, 1975). The one thing that can be agreed upon is that the heterogeneous group includes a group of children who show a different order of succession of the different cognitive domains than what Piaget described for normal children as well as a group in which the order remains the same as Piaget described for normal children.

Two of the three studies cited (Schmid-Kitsikis, 1973; McLaughlin, 1976) as well as my personal observations, do point to some of the children who show a different order of succession of domains having a more difficult time with those tasks in which the task's perceptual

components are in conflict with those tasks in which the logical reasoning that is required is not in conflict with the perceptual components of the task. For instance, they will do better on classification but poorer on conservation of matter where the shape of the clay changes although the amount remains the same.

Hypotheses I, II and III are based on the preceding summary:

Hypothesis I: Eight to twelve year old children who have been diagnosed as "schizophrenic" and who chronologically should have achieved a concrete operational level of thinking will instead fall into the three cognitive groupings of preoperational, heterogeneous and concrete operational thinking when given Piagetian tasks.

Hypothesis II: The heterogeneous children will include a group of children who show a different order of succession of the application of operations than what Piaget described for normal children: one-to-one correspondence, seriation, dichotomy, conservation of matter and class inclusion.

Hypothesis III: There will be a subgroup of children in the heterogeneous group who will do poorer on one-to-one correspondence and conservation of matter than the other tasks.

## Relationship Between Cognitive Development and Pripro

### Cognitive Development and Defense Effectiveness

Wulach (1976) and Safrin (1974) found that defense effectiveness increased with cognitive development in normal children. In addition, Wulach (1976) found that the Piagetian task of class inclusion had a higher correlation than the mean score with the measure of primary process. Class inclusion has a larger verbal component than the other tasks and a certain amount of verbal ability is needed for its achievements. Since language is the main mechanism of socialization it is possible that it is the verbal sophistication that is necessary for the achievement of class inclusion that shows such a high correlation with the measures of primary process. Therefore, it would follow that it is the degree of socialization as measured by the development of language that is correlated with the use of more socially acceptable and more adaptive defenses. Therefore, in using the Rorschach and Piagetian tasks as Wulach did, but with a population of children diagnosed as schizophrenic, I would expect to find that:

Hypothesis IV: Those children who have been diagnosed as schizophrenic and who have achieved a concrete operational level of thinking on class inclusion will show a higher defense effectiveness on the

Rorschach than those children who have not achieved class inclusion.

## Cognitive Development and Manifestations of Thought Disturbance

Wulach (1976) has compared cognitive development with the development of primary process thinking in normal children. I would like to repeat this comparison but using a population of children diagnosed as schizophrenic. In particular I would like to focus on cognitive organization and its relationship to the structure of the primary process as manifested in the different forms of thought disorder. The studies that looked at both primary process functioning and cognitive organization (Matalon, 1974; Safrin, 1974, Wulach, 1976) did not examine very closely this particular relationship. In addition, they were done with normal children. Before preceding, I would like to explain the reasoning that led up to my hypotheses.

Blatt and Wild (1976) found that there was evidence for a relationship between the degree of boundary differentiation (self-other differentiation) of adult schizophrenics and the type of thought disorder manifested on the Rorschach. Studies of normal children (Safrin, 1974; Matalon, 1974) have found that there is a relationship between the type of thought disorder manifested on the Rorschach and the level of cognitive functioning. This would follow Holt's belief

(1967) that primary process as a system of thought develops along with the overall structural development of the child. The following hypotheses are based on my speculation that there is a relationship between the different levels of cognitive organization and the different levels of self-other differentiation as manifested in the type of thought disorder shown on the Rorschach: the lower the level of cognitive organization the more undifferentiated would be the type of thought disorder according to the continuum of differentiation described by Blatt and Wild (1976).

Blatt and Wild believed that contaminations showed the least sign of differentiation in adult schizophrenics. Although object constancy has been achieved there is difficulty in maintaining the differentiation between the object and its representation which results in the fusion between two separate precepts and, or ideas on the Rorschach. This type of response is defined as a contamination. In looking at children who have been diagnosed as schizophrenic it would follow that:

> Hypothesis V: Contaminations will be associated with those children who are at a preoperational level of thought more often than fabulized combinations.

According to Blatt and Wild confabulations showed a greater amount of differentiation than contaminations. In a confabulation

there is a "loss of distinction between internal experience and external reality manifested in extensive unrealistic elaborations around at least partially accurate precepts" (p. 56). Therefore:

> Hypothesis VI: The heterogeneous group of children will be more likely to manifest confabulations than contaminations on the Rorschach.

There seems to be a subgroup of the heterogeneous children who have greatest difficulty with tasks in which there are perceptual alterations (conservation tasks). They have a rather concrete approach to reality which is similar to what Blatt and Wild described for fabulized combinations which are the least undifferentiated of the thought disturbances and are described as showing a tendency toward the fusion of the object and its representation; a tendency which is defended against by a concretization of thinking. Therefore:

> Hypothesis VII: Those children who are heterogeneous and who have not achieved one-to-one correspondence are more likely to show fabulized combinations in the Rorschach than those heterogeneous children who have achieved one-to-one correspondence.

## Cognitive Development and its Relationship to Reality-Testing

McLaughlin (1976) found a positive correlation between one-to-one correspondence and the reality-orientation of psychotic children as measured by a questionnaire. I will elaborate on the previous findings by using the "schizophrenic" child's functioning on the Rorschach as a measurement of reality-testing. Following Meyer and Caruth (1964) I would like to make a distinction between external and internal reality-testing. In accordance with Meyer and Caruth external reality-testing will be measured by the presence or absence of confabulated responses. Reality-testing on the Rorschach, then, consists of a complex interplay between these two factors. The following hypotheses are based on my speculation that the achievement of one-to-one correspondence is associated with the maintenance of external reality-testing on the Rorschach.

Hypothesis VIII: Those children who are preoperational will show consistently poor external reality-testing as measured by the form level on the Rorschach as compared to those children who are heterogeneous and concrete operational.

Hypothesis IX: Those heterogeneous children who have achieved one-to-one correspondence

will show significantly better form level on the Rorschach than those heterogeneous children who have not achieved one-to-one correspondence.

Hypothesis X: Those heterogeneous children who have achieved one-to-one correspondence will show significantly better form level when the response is a confabulation than those heterogeneous children who have not achieved one-to-one correspondence.

# Chapter II

## METHOD

The research method chosen for this study will be a combination of a statistically analyzed experiment and a case study. I believe that the experimental method is important in clarifying how widely our insights into behavior can be applied and in which circumstances these insights are relevant. In addition, it also opens up new avenues of research. But, I also believe that it is only through an indepth analysis of each individual that the full richness and complexity of human behavior can be understood. It is from this renewed inspection of the details of behavior that new hypotheses are generated that are most congruent with the intricacies of human functioning.

This combination of a statistical and clinical approach is especially pertinent to the attempt to understand the structural organization of psychotic children. There is tremendous variety among the children included in this diagnostic category; in addition, each child within this category manifests the psychotic process in a unique and complex way. The use of both a statistical and clinical approach will help in widening and deepending our understanding of this clinical phenomenon.

To be more specific, the base study method used will be a qualitative analysis of both the Rorschach and Piagetian protocols. The aim of this analysis will be to describe the level and manner of cognitive organization each child has achieved and how this affects, relates to, or in some cases determines the way the child's inner world is organized and expressed and his ability to maintain contact with external reality. In addition to the case study method, appropriate statistical procedures will be applied to the data in the experimental analysis in an attempt to discover some of the general principles that will help in explaining the relationship between cognitive organization and the structure, content and quantity of primary process thinking.

## Experimental Design

### Subjects

The subjects in this study were chosen from a residential treatment center for emotionally disturbed children in Manhattan run by the Jewish Child Care Association. Because of a strike that prematurely terminated the collection of my data (see Chapter III) there were fourteen children that were given the Piagetian tasks while only eleven of these children were given the Rorschach as well. The children were chosen according to the following criteria:

1. They were between the ages of 8 and 12 years of age (inclusive).
2. Of the eleven subjects who received both the Piagetian tasks and the Rorschach, eight were boys and five were girls, while there were two boys and one girl who only received the Piagetian tasks.
3. There was an attempt to use children who had been diagnosed by both a psychiatric evaluation and a psychological test battery as "schizophrenic." When the two diagnoses were not congruent the psychologist's diagnosis was used.
4. There was an attempt to minimize gross organic damage through the examination of available neurologicals and the Bender.
5. The children used had a Full Scale I.Q. of 70 or above on the WISC.
6. They were all English-speaking.

Eight to twelve years of age was chosen because this age-range encompasses the period of concrete operational thinking in normal children.

"Schizophrenic" children were chosen because I hoped to find clear disturbance of thinking in this population and wished to delineate the structures that were associated with this particular type of pathology. In the residence used in this study the diagnostic label used for schizophrenic children by the psychologist is "ego deviant with underlying schizophrenic process." This diagnostic label was paired with the psychiatric diagnosis of "schizophrenic." Since there were not enough children in which the diagnostic labels were in agreement, it was decided to use the psychologist's diagnosis since the psychologist based her diagnosis on a developmental and structural analysis of the test data which was more congruent with my own approach than the psychiatric diagnosis which was based on a behavioral and descriptive classification of symtpoms. Since these children are continually being reevaluated, the most recent diagnosis was used. It should be pointed out that although an attempt was made to select a population with the same diagnosis, the homogeneity of the diagnosis was not felt to be absolutely essential since the intention of the study was to use the different cognitive groupings as a way to differentiate the groupings and subgroupings of children labeled "schizophrenic."

Although the intention had been to pick children of average intelligence in order to be able to compare them to non-psychotic children of average intelligence, it soon became clear that this would

not be possible and probably not advisable. The residential center was no exception to the literature in which it has been reported that children who have been diagnosed as "schizophrenic" tend to be below average in intelligence (Goldfarb, 1961) as measured by I.Q. tests. Therefore, it was decided to use children whose Full Scale I.Q. fell above 70. By including children who fell within the borderline range of intelligence the population used in this study was kept similar to the "typical" schizophrenic child described in the literature.

Previous available neurologicals and the Bender were examined to minimize the possibility of gross organic damage being responsible for the lowered I.Q.s. The psychologist attempted to differentiate those Benders that showed a schizophrenic process from those that showed the effects of organicity. It was felt important to do this in order to include those children who might have poor Benders but where it was part of the schizophrenic process. If all the poor Benders had been ruled out this might have also ruled out some of the more disturbed children.

## Procedure

The Rorschach and five Piagetian tasks: class inclusion, conservation of matter, one-to-one correspondence, seriation and dichotomy, in that order, were presented to each child. They were first given the Piagetian tasks which were then followed by the

Rorschach. Because of the small number of subjects the Piagetian tasks were given in the same order so as to not confuse the effects of the sequence of the tasks with the children's functioning on the tasks themselves. In addition, a recording was made of all their verbalizations from the beginning of the testing to the end.

## Piagetian Methodology

### Clinical Method

The administration of the Piagetian tasks followed the clinical method used by Piaget. It was structured around a specific set of questions but none of the children were presented with exactly the same questions in exactly the same way. The reasoning behind this is that Piaget's clinical method depends on the examiner being able to respond to the child's answers. The aim of this method is to uncover the thought processes of the child when he or she is confronted with a problem that they must solve cognitively. Piaget hopes to uncover how the child organizes his reality and in what way he deals with new information that he receives from the external world. In order to do this it is necessary for the examiner to be flexible in the questioning so that she may be sure of the organization and quality of the child's thinking. For instance, if the examiner feels that the child is uncertain of his answer she may use a counter-

suggestion. A counter-suggestion presents the child with a contradiction. It may be in the form of reminding the child of a previous answer that contradicts the present one, or it may be in the form of telling a child that another child gave the examiner a different answer. The child's response to these contradictions will clarify for the examiner how firmly entrenched the child is at that particular cognitive level. Another procedure is that the child is always asked to justify his answer. The examiner may continue to question the child until the process by which the child arrived at his conclusion becomes clear. In both these instances, if it were not possible to be so flexible it would be difficult to explore the child's thought processes in such depth. It is this focus on the quality of the thought process that makes the Piagetian method so valuable.

In dealing with children who are severely disturbed it is not only important to be able to probe and question their answers, but it is also important that the testing situation be as flexible as possible. This means being willing to discontinue a testing situation or a test if the child becomes upset, or taking a break when one wouldn't ordinarily do so. The more the examiner attempts to force the "schizophrenic" child to accommodate to the testing situation, the less information will be obtained and the less valid it will be. Of course, it is also important that these variations between the testing situations of the children

remain at a minimum so that the data that is collected can, in the end, be reliably compared.

## Piagetian Tasks

I would like now to describe the five Piagetian tasks that will be used in this study.

One-to-one correspondence: One-to-one correspondence is a task that deals with the most primitive notion of conservation. It normally is achieved around seven years of age. In the first part of the task the child is given an unequal number of circles and squares and told to line them up facing each other so that each circle has a square; the extra ones are discarded. This calls for the establishment and understanding of equivalence. In the second part of the task the experimenter rearranges one line in different ways, at one point lengthening the line of squares, at another point shortening the line, etc. so that the perceptual equivalence is broken although the circles and squares are still equivalent in number. The child is asked if each circle still has a square and to justify his answer. In between each rearrangement the shapes are returned to their original state of perceptual equivalence. The child's answers show whether he understands that although the perceptual equivalence is broken there still remains one circle for each square. The understanding of this concept is essential to the child's eventual understanding of

the concept of number.

In the first stage the child is unable to make the original correspondence so that each circle has a square. According to Piaget, this occurs because the child tends to focus on the whole ("global") perceptual configuration so that if just the ends of the two lines of object correspond the child will say that the two lines are equal in number. In the second stage the child is able to make the original correspondence but as soon as there is a perceptual discrepancy, i.e., one line "looks" longer than the other, the child loses the concept of conservation and says that the line that looks longer has more. At this stage it is the transformations themselves that cause the child most difficulty. Although there is the beginning of operational thinking, there is still a tendency toward a static, perceptually bound interpretation of reality. In the third stage operational thinking enables the child to realize that although one line "looks" longer than the other there is still the same number of objects in each line. There is now the domination of abstract thought in the interpretation of reality over the more immediate, perceptually bound interpretations. (For a more extensive description of one-to-one correspondence, see Piaget, The child's conception of number, 1965.)

Conservation of matter: Conservation of matter is also essential to the concept of number. Unlike one-to-one correspondence

in which a discontinuous quantity is used, conservation of matter uses a continuous quantity. The child is first asked to establish equivalence by making sure that the two balls of clay are equal. Then the notion of conservation is explored by one of the balls being transformed into different shapes and the child being asked whether the two balls of clay still contain the same amount. In order to achieve this task not only must logic dominate perception, but the child must be able to coordinate more than one dimension at a time, i.e., although the clay is longer it is also thinner and therefore still the same in amount as the shorter but fatter ball of clay.

The first stage consists of the child assuming that when the two balls of clay that were originally equivalent "look" different that they contain a different amount. Once again, as in one-to-one correspondence, it is the global perceptual impression that dominates. The second stage is when the child flucturates between stage two and stage three thinking: at one point the perceptual impression dominates and at another point operational thinking dominates. In the third stage the operations of conservation and reversibility allow the domination of abstract thinking over more static, perceptually bound thinking.

Seriation: In seriation, which is achieved around seven years of age, it is the method of achieving the task that is focused on, not the child's success or failure. In this task the subject is handed ten graduated sticks. In contrast to one-to-one correspondence and

conservation of matter, the perceptual components of this task tend to be helpful rather than conflictual, although there is an attempt to keep the size differences very small so that the child is forced to use direct comparisons rather than relying on gross perceptual differences. The subject is then asked to arrange the sticks from the biggest to the smallest, "like a staircase." He is then given one stick that has been left out and asked to place it in the appropriate position in the serial order. In the last part of the task, the "staircase" is dismantled and the experimenter asks the child to hand her the sticks in the correct order to make another staircase. She lines them up out of the child's line of vision behind a screen. The investigator records in each of these tasks how the child went about choosing each stick as well as the order in which it was chosen. What is looked for is if the child has an organized approach to the task which would imply an internalization of a systematically organized approach and stage three thinking; whether he simply uses trial and error which would imply the lack of a systematically organized approach and stage two thinking; or whether he is unable to achieve the seriation at all (stage one thinking) and clusters the sticks in many different small clusters or ends up with the tops seriated correctly but the bottoms showing no uniform seriation because he only focused on the tops of the sticks and not their length. This first stage of thinking demonstrates the lack of decentration in the child's inability to focus on more than

one dimension at a time. (See Piaget, 1965 for a fuller description.)

Dichotomy: Dichotomy, which is achieved around eight years of age, explores the child's ability to classify. He is given different geometric shapes, circles and squares, in two different colors, red and blue, and two different sizes, large and small. The first part of the task consists in asking the child to describe these objects and then to arrange them so that "all the ones that are alike go together." In these first two steps the examiner obtains an idea of the child's spontaneous approach and classification of the disparate objects. The second part of the task is the examiner requesting that the child arrange the objects in two groups. The child is asked to describe what he calls the grouping and to explain why he put them together in this way. The child is then asked to rearrange the objects in a different two groups. After the child rearranges the objects and justifies the arrangement he is asked to arrange the objects in yet another two groups.

According to Piaget (1964), in the third stage the child's ability to reflect on what he has done as well as use anticipatory schemata to plan what he will do next results in the stage three child being able to spontaneously arrange the objects into three different groupings of color, shape and size. Developmentally, size is seen as a later classification than shape or color. Stage two children are more bound in their arrangements by the perceptual components and show

less flexibility in using anticipatory and retroactive schemata. They are often able to achieve two groupings but not three. In addition, one frequently sees groupings which are perceptually balanced and are not determined by more abstract criteria. Stage one children often show a more egocentric and global approach. They frequently do not include all the objects in their classifications and, or combine all the objects into a design or a realistic object.

Class inclusion: Class inclusion, which is also a task of classification, includes a larger verbal component than dichotomy. The child is given two unequal subcategories of a class, in this case two donkeys and ten bears which are two subsets of the set of animals. He is asked if the two subcategories in front of him belong to the main category. Once this has been established, the experimenter investigates, through questioning, the child's full understanding of the relationship of the subclasses to each other and the main classes. For example, the experimenter will ask the child if there are more animals or more horses on the table to determine the child's ability to keep in mind simultaneously the class and subclass and their relationship to each other. Unlike the other tasks described, a certain sophistication of language is required for the child to be able to answer successfully.

There is a rather global, perceptual approach to reality in stage one thinking that dominates the way the child organizes his world. He will tend to classify according to perceptual configurations rather

than any abstract criteria as was described for dichotomy. Although the child is able to answer some of the questions in the second stage, he still shows a tendency toward being perceptually bound. Children show the most difficulty when they are asked to compare the class of animals with the subclass of bears in the second stage. They tend to focus on the quantity of bears since this is most perceptually salient, and respond that there are more bears than animals on the table. By stage three the children show the ability to organize the objects according to abstract criteria and not to allow the more static, perceptually bound aspects of reality to dominate.

## Rorschach Methodology

### Administration

The Rorschach will be given according to Holt's method which follows Rapaport's method of administering the Rorschach (Rapaport, Gill, & Schafer, 1972). The one addition will be an inquiry into the affect associated with each response. (See Appendix B: Procedure, for a fuller description of the administration of the Rorschach.)

### Scoring

In order to evaluate the children's primary process thinking the Rorschach will be analyzed according to Holt's method (1975). Although

Holt's method was designed for adults, it will be retained as is in the present study. It is felt that since the previous studies using children (Wulach, 1976; Safrin, 1974; Matalon, 1974) used Holt's method unchanged, it is best not to attempt to modify the method in the present study. If the Rorschach scoring needs to be modified for future studies that will be a task that can be discussed better after examining the results from this study. The following is a description of this method:

Non-primary process measures: Every response on the Rorschach is rated for: (a) the form level (perceptual structure) which is rated on a scale from 1 to 7, from sharp, convincing forms to spoiled form responses, and (b) creativity which is rated for statistical likelihood and richness of the response.

Criteria for whether or not a response is a manifestation of primary process: The criteria for rating a response as a manifestation of primary process, or Pripro, is that it falls into either of the following two categories: (a) Content, which includes libidinal content such as oral, anal, phallic, homosexual or voyeuristic responses, and aggressive responses; and, or (b) Formal deviations from logical thinking such as: condensations, arbitrary combinations, displacements, symbolism, affective or logical contradictions.

Additional scoring of each Pripro response: Each primary process score is then analyzed for the following: (a) the degree of closeness to the primary process pole: Level 1 includes those responses which are

more primitive, blatant and shocking, while Level 2 includes those responses which are more socialized, integrated and subtle; (b) the specific Control and Defense mechanism: first, there is a description of the defense manifestation: remoteness, delay, reflection, rationalization, projection and contextual defenses such as humor or intellectualization. Then each defense is given a plus, minus or neither depending on whether it contributes to, detracts from, or has little effect on the expression of primary process. (c) The Defense Demand on a scale from 1 to 6 is then scored. This is a rating of shock value of the primary process, i.e., how much the response demands measures to make it socially acceptable. (d) Defense Effectiveness (scale: +2 to -3) is a rating of effectiveness of the control in handling the Defense Demand. The criteria for judging this includes: Form level, affect, adaptive defenses, and general clinical judgment. Finally, (e) Adaptive Regression is scored. This is the judging of the adaptive versus the maladaptive nature of the regression. It is found by multiplying the Defense Demand by the Defense Effectiveness and dividing that score by the number of Pripro responses.

Summation scores: Each protocol ends up with summary scores for the following: (a) sum of primary process responses, Sum Pripro; (b) average form level; (c) mean creativity score; (d) content (libidinal and aggressive) which is scored for: Level 1 percent, the percent of the content category that is more blatant and primitive; and Level 2

percent, the percent of the content category that is more socialized; and sum of Level 1 and Level 2 percent; (e) formal deviations from logical thinking are scored the same, for: Level 1 percent, Level 2 percent and the sum of Level 1 and Level 2 percent. Finally, the (f) percentage of libidinal content and (g) the percentage of aggressive content are scored.

Final analysis: The main primary process scores that result from this analysis are: (a) the percentage of Level 1 Pripro, i.e., those primary process responses that are more primitive, (b) percentage of Level 2 (more socialized primary process responses), and (c) the sum of Level 1 and Level 2 percentage of the primary process responses, Pripro. In addition, (d) defense demand (average), (e) defense effectiveness (average), and (f) adaptive regression (average) are all important indicators of the manner in which the individual handles primary process material.

# Chapter III

# RESULTS

Before preceding with a presentation of the results I would like to describe an event that affected the collecting of my data and is important in a full understanding of the following findings. In addition, I will describe the organization of the following chapter.

About two-thirds of the way through the collecting of my data a strike occurred at the institution I was using for my population. Some of my subjects were sent home for the duration of the strike while others remained in the rather tense and understaffed residence. I was unable to continue testing the children in the study because they were either at home or I would have had to cross an extremely tense and hostile picket line. The strike lasted approximately two months. At the time of the strike I had completed the testing of eleven of the subjects and had given three subjects the Piagetian tasks but not the Rorschach. When the children returned after the strike I felt that both their internal states and the state of the institution were too turbulent and I did not want to risk confounding my findings by including results that might be affected by the recent upheaval. Therefore, I decided to base my study on the protocols I had collected before the strike. This means that the findings on the Piagetian data are based on fourteen subjects while the findings

on the comparison between the Piagetian and the Rorschach variables are based on eleven subjects.

The following chapter is divided into two sections: a quantitative and a qualitative analysis of the findings. The quantitative analysis presents the statistical results, both those pertaining to the original hypotheses and those pertaining to additional findings, as well as the implications of these findings. I have chosen to report all those results starting at a .05 level of significance. The small amount of subjects as well as the tremendous amount of variation in the functioning of this "schizophrenic" population made it necessary to do this in order to be able to indicate all the trends noted in the wealth of material collected. The Pearson product-moment correlation coefficient was used in order to pinpoint potentially important relationships in the data collected. The small number of subjects made it necessary for me to then use Fisher's exact probability test (Siegal, 1956), that has been developed for small samples, on the relationships that had been found significant using the Pearson product moment correlation coefficient in order to safeguard against obtaining false-positive relationships. This statistical procedure enabled me to focus on those relationships that were truly significant.

The qualitative analysis consists of case studies of the children who were given both the Piagetian tasks and the Rorschach. This second analysis has two main aims. The first is to use the individual

children to elucidate the statistical relationships described in the quantitative results. The second aim is to explore in depth the functioning of those children who are exceptions to these statistical relationships. In both the quantitative and qualitative results the "exceptions" were found by using the matrices in the Fisher exact test to pinpoint those subjects who did not fall within the clusters that determined the statistical trend. The children who I have chosen for the qualitative analysis are those that best elucidate the trends described. The analysis of the remaining children's functioning can be found in Appendix E.

## Quantitative Results

I would first like to summarize the following findings. The majority of the children showed a delay in the development of the cognitive structures and a lack of the structural closure associated with the concrete operational stage of thinking. In addition, they did not show the same order of succession of the tasks as Piaget described for normal development. In particular, seriation, which in normal development proves to be one of the easier tasks, proved to be the most difficult task for the "schizophrenic" children. Furthermore, unlike normal children, there were frequent intrusions of egocentric material into these children's cognitive functioning which

was associated with high defense demand and poor controls on the Rorschach.

Congruent with Wulach's (1976) findings, a relationship was found between the development of operatory structures and the ability to control the expression of primary process thinking as well as minimize deviations from logical thinking; however, this was not paralleled by an increasing socialization of primary process thinking. In addition, unlike the findings for normal development, it was the operatory structures involved in one-to-one correspondence and class inclusion that proved to be critical both in overall cognitive development and in their effect on primary process thinking. However, the frequent exceptions to these findings point to the control and regulation of primary process thinking by operatory structures being a relationship that is particularly vulnerable to disruption in "schizophrenic" children; for example, as in the Rorschach where the emergence of fantasy material frequently disrupted the perceptual organization of reality.

## Evaluation of Hypotheses

### 1. Cognitive organization.

Piaget and Inhelder (1969) describe the period between two or three and eleven or twelve as a period which can be divided into two phases. The first phase is "a time of organization and preparation"

for operational thinking during which there is a recapitulation of the processes gone through on the sensory-motor level on the representational level (p. 94). The second phase "marks the completion of the concrete operations . . . which concern transformations of reality by means of internalized actions that are grouped into coherent reversible systems . . . " (p. 93).

Hypothesis I states that eight to twelve year old children who have been diagnosed as "schizophrenic" and who chronologically should have achieved a concrete operational level of thinking will instead fall into three main cognitive groupings when given Piagetian tasks: preoperational, heterogeneous, and concrete operational.

To evaluate this hypothesis each task was first assigned a stage level based on the agreement of at least two of the three judges. Inter-rater realiability as measured by Pearson product moment correlation coefficients is presented in Table 1. Table 2 presents the assigned level of achievement for each subject for each task. Only those children who had achieved stage 3 on all five tasks were considered to show the internalization and coordination of operations typical of the fully concrete operational child. Those children who were transitional, or who achieved at different cognitive levels on different cognitive tasks were considered "heterogeneous," a term which is meant to signify the multi-levels these children achieve on and to differentiate them from the normal transitional children

Table 1

Inter-Rater Reliability

| Task | 1 x 2 | 3 x 2 | 3 x 1 |
|---|---|---|---|
| One-to-one correspondence | .861** | .848** | .730* |
| Class inclusion | .877** | .713* | .617* |
| Seriation | .966** | .925** | .909** |
| Conservation of matter | .891** | .870** | .778** |
| Dichotomy | 1.000** | .558* | .558* |

*$p < .01$

**$p < .001$

Table 2

Level of Achievement for Each Task*

| Subject | One-to-one Correspon. | Conservation of matter | Seriation** | Class inclusion | Dichotomy |
|---|---|---|---|---|---|
| P | 3 | 3 | 3 | 3 | 3 |
| V | 3 | 3 | 3 | 3 | 3 |
| E | 3 | 3 | 2 | 3 | 3 |
| PT | 3 | 3 | 3 | 3 | 2 |
| S | 3 | 3 | 2 | 3 | 2 |
| VN | 3 | 3 | 1a | 2 | 3 |
| J | 3 | 2 | 2 | 3 | 1 |
| G | 2 | 2 | 1b | 2 | 3 |
| D | 3 | 3 | 2 | 2 | 2 |
| A | 2 | 2 | 2 | 2 | 3 |
| M | 2 | 1 | 1b | 1 | 3 |
| T | 3 | 2 | 1b | 2 | 2 |
| TN | 2 | 3 | 1b | 2 | 2 |
| L | 2 | 2 | 1a | 2 | 1 |

*1=preoperational, 2=transitional, 3=concrete operational

**In seriation, 1a and 1b=preoperational.

described by Piaget. The overall stage and average level of functioning is presented in Table 3.

Fourteen percent (two) of the children diagnosed as "schizophrenic" achieved at the concrete operational level of thought while eighty-six percent (twelve) achieved at the heterogeneous level. There were no totally preoperational children. Therefore, the findings, except for the lack of the preoperational group, were congruent with Hypothesis I.

Hypothesis II states that the heterogeneous group of children will include a group of children who show a different order of succession of the application of operations than with Piaget described for normal children: one-to-one correspondence, seriation, dichotomy, conservation of matter, and class inclusion.

Hypothesis II was supported in that all the children who showed heterogeneous functioning showed a different order of succession of the tasks than Piaget described for normal children; however, unlike previous studies, there were no heterogeneous children who showed a normal order of succession.

An order of succession that was noted in an analysis of all the cases was that seriation was only achieved after class inclusion and class inclusion was only achieved after one-to-one correspondence. In order to evaluate these relationships statistically, Fisher's exact probability test was performed on one-to-one correspondence and

Table 3

Overall Level of Achievement for Each Subject

| Subject | Average | Stage |
|---|---|---|
| P | 3 | Concrete operational |
| V | 3 | Concrete operational |
| E | 2.8 | Heterogeneous |
| PT | 2.8 | Heterogeneous |
| S | 2.6 | Heterogeneous |
| VN | 2.4 | Heterogeneous |
| J | 2.2 | Heterogeneous |
| G | 2.0 | Heterogeneous |
| D | 2.4 | Heterogeneous |
| A | 2.2 | Heterogeneous |
| M | 1.6 | Heterogeneous |
| T | 2.0 | Heterogeneous |
| TN | 2.0 | Heterogeneous |
| L | 1.6 | Heterogeneous |

class inclusion, and on class inclusion and seriation. It was found that one-to-one correspondence and class inclusion had a relationship significant at the .025 level with one-to-one correspondence always preceding class inclusion. In addition, class inclusion and seriation were found to have a relationship significant at the .01 level with class inclusion always preceding seriation. Therefore, seriation, which in normal cognitive development is found to come earlier than class inclusion, in children diagnosed as "schizophrenic" is found to come later. This was similar to Shackelford's (1976) finding that seriation was the most difficult task for her subjects. The other tasks varied in order of the sequence of achievement.

Hypothesis III states that there will be a subgroup of children in the heterogeneous group who will do poorer on one-to-one correspondence and conservation of matter than the other tasks.

In order to evaluate whether these two tasks had a relationship a Fisher exact probability test was done. There was no significant relationship. In addition, most of the children did the same or better on these two tasks than the other tasks. Therefore, Hypothesis III was not supported. Contrary to previous findings (Schmid-Kitsikis, 1973; Shackelford, 1976) the tasks where there were global perceptual transformations such as one-to-one correspondence and conservation of matter, did not prove to be harder for these children than the other tasks.

What did prove important, however, was the achievement or lack of achievement of one-to-one correspondence and class inclusion. The relationship between these two tasks has already been established. An analysis of these two tasks' relationship with the sum of Piagetian scores for each child found that those children who were concrete operational on both these tasks were more likely to be higher cognitively than those children who had not achieved these two tasks. These findings were significant at the .005 level. Therefore, achievement of one-to-one correspondence and class inclusion are more integrally related to the overal level of cognitive organization than the other tasks tested.

In summary, the majority of these children who have been diagnosed as "schizophrenic" and who should have achieved a concrete operational level of thought show uneven cognitive development. Although they are capable of operational thinking in some areas, these mechanisms have not generalized to all areas of their thinking and, or, these children are unable to maintain operational thinking under the stress of a counter-suggestion. In addition, Piaget's description of the sequence of achievement of these tasks seems only to hold true for the "normal" population and as soon as other factors intervene into the overall cognitive development, there is interference in the structuralization of the normal sequence of achievement of the individual tasks. Another important finding

was that one-to-one correspondence and class inclusion appear to be critical operations that are more integrally related to the overall level of cognitive organization than the other tasks tested. Furthermore, seriation, similar to previous studies with schizophrenic children, proved to be the most difficult of the tasks for the children to achieve.

2. Relationship between cognitive development and Pripro

As Holt (1970) points out, "No observable thought product. . . is the primary process; it is always a result of a process that must be inferred to account for such products!" (p. iv). "Pripro" is the term that is used to refer to these primary process products. The scoring of the Rorschachs for Pripro in this study was done by a person trained by Robert Holt in his particular scoring procedure. The main findings are reported in Table 4.

Cognitive development and defense effectiveness. Hypothesis IV states that those children who have been diagnosed as "schizophrenic" and who have achieved a concrete operational level of thinking on class inclusion will show higher defense effectiveness on the Rorschach than those children who have not achieved class inclusion.

The defense effectiveness measure takes into account the form level of the response, the accompanying affect, and the amount of positive or negative control and defense scores as well as a final adjustment of the rating according to the scorer's clinical judgment.

Table 4

Main Significant Findings between Pripro and Piagetian Variables Using the Fisher Exact Test

| | Defense Effectiveness | | Formal Deviations | |
|---|---|---|---|---|
| Sum Piaget | 5 | 1 | 0 | 5* |
| | 1 | 4 | 4 | 2 |
| Hi/Lo Piaget | 5 | 0** | 1 | 4 |
| | 1 | 5 | 4 | 2 |
| One-to-One Correspondence | 4 | 0* | 0 | 4* |
| | 2 | 5 | 5 | 2 |
| Class inclusion | 4 | 0* | 0 | 4* |
| | 2 | 5 | 5 | 2 |

*$p < .05$

**$p < .025$

It is an attempt to estimate the degree to which primary process material is successfully controlled.

Those children who scored stage 2 and above on class inclusion showed a significantly higher score on defense effectiveness (level of significance = .05) than those who were below stage 2. Therefore, Hypothesis IV was supported.

Defense effectiveness also showed a positive correlation with one-to-one correspondence. Those children who were stage 3 on one-to-one correspondence showed a higher defense effectiveness than those who were below (.05). Furthermore, those children whose average Piagetian functioning fell above 2.50 showed higher defense effectiveness than those below (.025). Therefore, although Hypothesis IV was supported, it seems that defense effectiveness rather than being solely related to those factors inherent in the achievement of class inclusion, is also associated with those factors underlying the achievement of one-to-one correspondence and the overall cognitive score.

Cognitive development and manifestation of thought disturbance. The following thought disorders are grouped under what Holt (1970) calls the "formal" as opposed to the "content" primary process products. The formal score is applied to responses in which there are deviations in the thinking process itself caused by the primary process. The content variables are simply when the content of the responses

imply the effect of the primary process. A response can include both these manifestations of the primary process or only one of them. In addition, although Holt's method scores each type of thought disorder for whether it is more "primitive and blatant" (level 1) or more "socialized" (level 2), I have chosen to combine both levels because of the unexpectedly small amount of thought disorder manifested in these children's Rorschach protocols.

Hypothesis V states that contaminations will be associated with those children who are at a preoperational level of thought more often than fabulized combinations.

Contaminations are contained in Holt's scoring system. Fabulized combinations were scored by grouping together two subgroups of thought disorders grouped under condensation: "compositions" and "arbitrary combinations." Both forms of thought disorder consist of an "image that is a composite of parts that do not actually belong together in nature" (p. 26). When "the incongruous elements are merely brought into juxtaposition" it is an arbitrary combination, when it results in something with an "organic unity" it is a composition.

None of the children showed contaminations. The most frequent type of thought disorder for most of the children was fabulized combinations which was similar to what Matalon (1974) and Safrin (1974) found for normal latency-age children. In addition, there were

no preoperational children. Therefore, it was not possible to evaluate Hypothesis V. It is interesting to note, however, that the lack of a preoperational group is paralleled by the lack of contaminated percepts.

Hypothesis VI states that those children who are heterogeneous and have not achieved one-to-one correspondence are more likely to show fabulized combinations in the Rorschach than those children who are heterogeneous or concrete operational and have achieved one-to-one correspondence.

There was no significant difference, as measured by the Fisher exact probability test, in the amount of fabulized combinations between the heterogeneous children who had achieved one-to-one correspondence and those who had not achieved it. Therefore, there was no support for Hypothesis VI.

Hypothesis VII states that the heterogeneous group of children will be more likely to manifest confabulations than contaminations on the Rorschach.

Holt's category of "autistic elaboration" was considered to be the equivalent of Blatt and Wild's (1976) definition of confabulation. The autistic elaboration is scored when there is the "presence of thematic, often dream-like fantasizing" (p. 52).

Although there were more confabulations than contaminations there was not sufficient data to statistically analyze Hypothesis VII.

In summary, none of the Piagetian tasks or groupings of tasks were found to have a relationship that was statistically significant with any of the types of thought disorder. One problem in obtaining significant results was that even when there was a trend in the direction predicted by the hypotheses, the unexpectedly small amount of thought disorder manifested on the Rorschach resulted in non-significant findings. There was, however, a significant relationship (.05) between the sum of Piagetian tasks and the percentage of formal deviations using the Fisher exact test. The higher the sum of the Piagetian tasks the lower the amount of formal deviations. There was a similar relationship between one-to-one correspondence and the percentage of formal deviations (.05). Those children who were stage 3 on one-to-one correspondence had a lower amount of formal deviations than those who had not achieved stage 3.

Cognitive development and reality-testing. Hypothesis VIII states that those children who are preoperational will show consistently poor external reality-testing as measured by the form level on the Rorschach as compared to those children who are heterogeneous and concrete operational.

Unlike the other Holt measures, form level, a measure of perceptual structure, is scored for all the Rorschach responses not just the responses containing primary process material. The average form level was compared to the children's cognitive level using the

Fisher exact test. Because of the lack of a preoperational group there was not sufficient data to evaluate the hypothesis. There was also no relationship found between form level and any of the other cognitive tasks or summation of cognitive scores.

Hypothesis IX states that those heterogeneous children who have achieved one-to-one correspondence will show significantly better form level on the Rorschach than those heterogeneous children who have not achieved one-to-one correspondence.

No significant difference was found between the form level of the non-one-to-one heterogeneous children and the form level of the one-to-one heterogeneous children. Therefore, there was no support for Hypothesis IX.

Hypothesis X states that those heterogeneous children who have achieved one-to-one correspondence will show significantly better form level when the response is a confabulation than those heterogeneous children who have not achieved one-to-one correspondence.

Only three children were scored for confabulated responses. One was a non-one-to-one correspondence child while the other two had achieved one-to-one correspondence. This meant that there was not sufficient data to evaluate this hypothesis. However, a relationship was found between confabulated responses and form level (.05): those children who showed a high form level either showed no confabulations or only a tendency toward them while the children lower

in form showed more confabulations.

In summary, these findings would imply that along with the slowly developing operatory structures there is a corresponding gradual increase in effectively controlled expression of primary process material (DE) and the gradual decrease in deviations from logical thinking (formal). This is congruent with Wulach's (1976) findings for normal children. However, there were quite a few exceptions to these findings which implies that although a certain level of cognitive development is necessary for effectively controlled primary process thinking and the minimization of deviations from logical thinking it is not sufficient. Apparently, other factors can intervene which disrupt the control of primary process thinking by the operatory structures.

The findings on form level are interesting in that this measure of perceptual articulation which is not linked to primary process material does not show any development associated with cognitive development which is contrary to Wulach's (1976) findings with normal children that did find a relationship between cognitive development and form level. A major difference between this study and Wulach's is that the present study does not have a preoperational group. I might speculate that the significant cognitive changes which are associated with increased perceptual articulation occur in the transition from the preoperational to the transitional period of

thought and therefore, those children who have been diagnosed as "schizophrenic" have developed structures that make them capable of perceptual articulation similar to normal latency-age children. It is interesting to note that although there has been sufficient structural development for adequate perceptual articulation the relationship between confabulation and form level point to poor perceptual articulation being associated with the emergence of the inner fantasy world typical of confabulated responses.

Additional Findings (see Table V)

1. Cognitive development and Pripro

Contrary to Wulach's (1976) findings on normal children the socialization of primary process material as measured by Pripro level 2 which includes level 2 content and formal Pripro responses, was not found to be correlated with cognitive development. There was also no relationship found between cognitive development and the amount of overall Pripro levels 1 and 2. However, a measure of density of the primary process material in each Pripro response was found to have a negative relationship with one-to-one correspondence and class inclusion (.05).

Density is created by dividing the number of primary process responses into the sum of the content and formal scores both levels 1 and 2. It is an attempt to compensate for content and formal scores

Table 5

Additional Cognitive and Pripro Variables: Matrices and Levels of Significance of the Fisher Exact Test

| Piagetian Development | Pripro: Density | Pripro: Adaptive Regression |
|---|---|---|
| Hi/Lo Piaget | 1 4<br>5 1 | 4 1*<br>0 6 |
| One-to-One Correspondence | 0 4*<br>6 1 | 7 0**<br>1 3 |
| Class inclusion | 0 3**<br>7 1 | 7 0**<br>1 3 |

*$p < .05$

**$p < .025$

that are not taken into account in computing Pripro 1 and 2 because they both occur in the same response (see Holt, 1970 for further explanation). As cognitive development increased density decreased. It would follow that the decrease in formal deviations that was previously reported as occurring with cognitive development could account for the decrease in density since as the cognitive structures develop there are fewer formal deviations and less possibility that a Pripro response would include both content and formal Pripro scores.

Another finding was that the same two cognitive measures of one-to-one correspondence and class inclusion were found to have a positive relationship with adaptive regression, a score that attempts to measure the ability to use primary process material adaptively. This measure is obtained by mulitplying the defense demand by defense effectiveness and dividing the total by the number of primary process responses in order to arrive at an average score. In addition, when the cognitive scores were divided into two clusters, those whose average score was above 2.50 had a higher adaptive regression score than those whose average score was below 2.50 (.05).

The additional findings on cognitive development and Pripro imply that although "schizophrenic" children show an increasing ability to express primary process material in a well-regulated way with the development of cognitive structures, there is not an increasing socialization of the primary process thinking itself.

2. Egocentric intrusions

One thing that frequently occurred in the "schizophrenic" children's Piagetian protocols was the intrusion of egocentric thinking into the tasks. These egocentric intrusions were either verbal or nonverbal expressions of a "private" preoccupation expressed through a fantasy or play (see Appendix D for scoring).

The most frequent type of intrusion was the child actively assimilating the materials into some fantasy. For instance, P's playing out some fantasy with the bears and horses used in class inclusion while simultaneously correctly solving the task. With some children this type of intrusion occurred frequently although it did not interfere with the achievement of the task. But at other times the task remained incomplete because of the intrusion. For instance, G, in dichotomy, insisted on building a snowman out of the materials and could not be shifted back to completion of the task. A rare but interesting occurrence was when the task became assimilated to the egocentric intrusion itself interfering with the successful completion of the task. In dichotomy, J, a foster child, classified and reclassified the materials according to an overall category of "families."

The egocentric intrusions occurred most in the two tasks of classification. Class inclusion, which was the only task that used realistic materials, was most vulnerable, but dichotomy, which was

the next highest, was the only task in which the task itself became assimilated to the egocentric intrusion. Conservation of matter which used clay as the material, also showed a high amount of egocentric intrusion while one-to-one correspondence was quite far below the top three tasks. Seriation showed the least egocentric intrusions; only one child, a child who had the highest amount of egocentric intrusions, had an intrusion on this task.

No relationship was found between egocentric intrusions and cognitive level. A high sum of egocentric intrusions in these children's functioning was found to be associated with: a high creativity score on the Rorschach (.005), a high defense demand (.025), and a low defense effectiveness (.05). The preceding findings would point toward the more unsocialized the primary process thinking (DD) and the lower the effective controls (DE) the more likely there will be egocentric intrusions into cognitive functioning.

3. Demographic variables

After testing these children a search was made through their clinical records to uncover demographic variables that might be helpful in elucidating some of the findings. For a full list of these variables see Appendix E.

A positive relationship was found between age and Piagetian stage. Those children ten years eight months and older were at a

higher cognitive level than younger children (.025). In addition, as the child's age increased so did the minimum Piagetian level, the lowest stage achieved on any of the tasks (.005). Seriation, which had proved to be one of the most difficult of the tasks for these children was also related positively to age (.025). Therefore, although as they get older they do continue to develop cognitively there seems to be an overall slowing down of cognitive development for the majority of the children diagnosed as "schizophrenic." Two of the twelve year olds in the present study were exceptions to the trend. Although they were amongst the oldest in this population they were both at a predominantly stage 2 level. Shackelford (1975), perhaps because she had a narrower age range in her population, did not find this relationship between age and cognitive level in her study of "schizophrenic" children.

Age was also found to be positively related to three Rorschach measures. Those children who were twelve years and older showed higher adaptive regression (.05), and a higher ratio of primary process content to formal deviations (.05) than the younger children, while children ten years six months and older showed more primary process distortions in their use of language on the Rorschach (.025) than younger children.

These findings on age point toward their being an overall delay in structuralization in the majority of these children that affects both

their cognitive functioning and ways of structuring the expression of primary process thinking. The older children are more likely to express primary process in the content of their responses and in verbal distortions of their language while the younger children showed more formal deviations in their precepts and fewer verbal distortions of their language as well as demonstrating a lower level of cognitive functioning.

## Implications of Quantitative Results

The following is a brief survey of some of the implications of the preceding findings. The two main implications are that: (1) three different cognitive patterns that arose from an analysis of the quantitative results imply that within the population tested there are at least three different patterns of functioning grouped under the rubric of "childhood schizophrenia"; and (2) the achievement or lack of achievement of certain cognitive tasks signals certain crucial changes in structural development: one-to-one correspondence and class inclusion are critical operations whose achievement is associated with crucial structural changes that affect the primary process functioning of the "schizophrenic" children, while the delay in the achievement of seriation appears to be linked to the overall delay of cognitive development in these children.

1. Three different patterns of functioning

The preceding findings on the relationship between age and cognitive level imply that within this population of "schizophrenic" children there are three different ways the cognitive structures may be affected.

The first cognitive pattern is that the children develop similar to normal children achieving a concrete operations stage of thinking and the related closure of the cognitive structure which results in a more stable interaction with reality because of the internalization of actions into "coherent reversible systems" (Piaget & Inhelder, 1969, p. 93). An analysis of the two concrete operational children's functioning found only one child's functioning (P's) to be similar to a normal concrete operational child. The other child, V, showed functioning that would place her on the higher end of the heterogeneous cognitive continuum.

The second way the cognitive structures may be affected is that there is a slowing down of cognitive structuralization. The children who demonstrated this pattern show an increase in cognitive level with age although chronologically they are behind the normal children described by Piaget. Although there is an increasing generalizing of operational structures to more and more cognitive domains, the fact that there was only one concrete operational child out of fourteen subjects is not sufficient evidence to say that these children eventually

reach a concrete operational level. In fact, what seems to occur is that although the minimum level of functioning increases and more and more areas become operational, the lack of structural closure and the resulting fluctuations in cognitive functioning persist. This functioning was typical of the majority of children described by Shackelford (1975).

A third way the cognitive structures may be affected in this population is that there is an arrest of development of the cognitive structures. An analysis of the matrix used in the Fisher exact test to determine the relationship between age and cognitive level found that there were two children who did not show an increasing level of cognitive functioning with age. Although they were both amongst the older children they were on the lower end of the cognitive continuum. This points toward an arrest of development of the cognitive structures. Only one of these children, A, will be used in the case studies because the other child, T, was one of the children who did not receive the Rorschach.

One area to explore is that the three different ways the cognitive structures are affected may be three different ways these children have evolved of remaining in some sort of psychological equilibrium with the environment. If one looks at these children's pathology in terms of their structural organization a further possibility is that these different cognitive organizations reflect three different patho-

logical entities. In order to explore these ideas the different cognitive organizations will become the basis for the grouping of case studies in the qualitative analysis of the results. A more in-depth analysis of these implications will occur in Chapter Four.

2. Critical operations

One-to-one correspondence and class inclusion. The statistical analysis points to class inclusion and in particular one-to-one correspondence as being critical operations in the process of cognitive structuralization. The achievement of one-to-one correspondence and class inclusion was more integrally related to the overall level of cognitive functioning than any of the other tasks tested. One-to-one correspondence seemed particularly significant since it preceded the achievement of all the other tasks except dichotomy. In the order of succession that was found that differed from what Piaget described for normal children, one-to-one correspondence always preceded class inclusion and class inclusion always preceded seriation. It is of interest and will be explored later that the three children who had not achieved one-to-one correspondence had achieved dichotomy, while only four of the eight children who did achieve one-to-one correspondence also achieved dichotomy. All of these findings point to one-to-one correspondence being a critical operation in these children's cognitive functioning.

Further statistical analysis found that it was not simply in terms of cognitive functioning that one-to-one correspondence was found to be a critical operation. McLaughlin's (1976) study found that one-to-one correspondence was important in the child's "reality-orientation." In the present study, one-to-one correspondence was found to be a critical operation in the children's primary process functioning. The structuralization implied in the achievement of one-to-one correspondence was found to be a development that made possible better structuring of the expression of the primary process thinking as was demonstrated in the statistical findings on defense effectiveness. These findings were similar to Wulach's (1976) findings on the relationship between overall cognitive development and the expression of primary process thinking for normal children.

Seriation. There are two points that will be explored more fully in Chapter Four with regard to seriation. The first is that it was this task that proved to be the most difficult for the "schizophrenic" children to achieve. This task was also the only task that showed a consistent relationship with age: as the children grew older they scored higher. I would speculate that an understanding of the children's difficulties with seriation would be crucial to an understanding of the factors involved in the overall delay of cognitive structuralization.

The second point of interest is that seriation showed fewer egocentric intrusions than any of the other tasks; in fact, only one child showed any egocentric intrusions on it. This is important to explore both in terms of the role of egocentric intrusions and in terms of a fuller understanding of seriation.

## Qualitative Analysis of Results

The case studies in the qualitative analysis will be grouped according to the different cognitive organizations described in the previous section. The main groupings are: (1) those children whose cognitive functioning is similar to normal concrete operational children; (2) those children in which there has been a delay in cognitive development; and (3) those children in which there has been an arrest of cognitive development. Each case study will focus on the functioning of the child that elucidates the statistical trends described in the quantitative results as well as the functioning that is contrary to the statistical trends described in the preceding section. The latter is what I called the "exceptions" which were found through an analysis of the matrices used in the Fisher exact probability test. It is hoped that through this dual approach the complexity of the different pathological organizations implied by the different cognitive patterns will be more fully elaborated.

Heterogeneous Children

The majority of the children (nine out of eleven) fell within this category. In order to be able to explore the implications of the achievement of one-to-one correspondence I have made an artificial division in the following case studies between those children who did not achieve one-to-one correspondence and those children who had achieved it. The underlying assumption in this division is that these two groups are a similar pathological entity at different levels of development.

1. Non-achievement of one-to-one correspondence

G and M were, cognitively, two of the lower functioning heterogeneous children who had not achieved one-to-one correspondence and whose functioning was congruent with the statistical relationships between primary process and cognitive development found for this group of children. The one other child, A, who had not achieved one-to-one correspondence will be discussed later since her age points to her being a different structural and very likely pathological entity. I have chosen to use G as an example of the heterogeneous children who have not achieved one-to-one correspondence since her functioning best elucidates the structural organization of this group.

G. G was a ten year old girl who had been placed in the residence two years ago as a child abuse case. She had been raised in an extremely abusive environment and by age seven was showing

some extremely bizarre behavior such as the licking and smelling of walls.

She was a small, dark-haired girl with an anxious and strained smile always glued to her face. She talked in a babyish, pseudo-exuberant manner as if attempting to be the "good girl" who everyone would like.

G's cognitive functioning ranged from stage 1b in seriation where she was only able to do small group comparisons, to what was scored as stage 3 in dichotomy where she was able to classify and reclassify the materials into three different classifications. Her average cognitive functioning was 2.16. On one-to-one correspondence she was at a stage 2 level because although she was able to make the original perceptual correspondence, she shifted from stage 2 thinking where a change in the perceptual relationship between the two sets changed her notion of the sets equivalency, to stage 3 thinking where although the perceptual relationship changed she was able to conceptualize that the amount remained the same. After that first shift she was able to maintain this stage 3 thinking even when confronted with a counter-suggestion. This differed from her functioning on class inclusion and conservation of matter where she fluctuated back and forth between the different levels of thought although this also resulted in a score of stage 2. There was no stability in these areas to her operational thinking. In general, the perceptual aspects of the tasks

dominated. This was reflected in a tendency toward a rather concrete thinking (not concrete operational). For example, when asked who would have more if I ate one piece of clay and she ate the other she replied, "there's be nothing left."

An interesting aspect to her functioning on dichotomy was the simultaneous existence of stage 1 attempts at classification, what Piaget describes as "graphic collections" (1964), and stage 3 thinking. After having spontaneously classified the shapes as to size and shape, she then made a design out of them and then made what Piaget describes as a "complex object" of a snowman. After I had repeated the directions she was able to complete a third classification of the materials by color, but she then returned to the snowman. At this point the snowman had taken on a life of its own and G went searching through the room for his scarf as if it really existed. There was a perseverative quality to her behavior. In this episode she had given a reality to an object which had simply begun as a manifestation of an earlier level of classification.

G showed extremely poor defense effectiveness on the Rorschach which resulted from a poor level of perceptual organization (form) and a higher number of formal deviations, especially confabulations, than the majority of this population. However, the amount of primary process material was still low compared to what Wulach (1976) described for normal children her age. Most of the primary process thinking

tended to be more socialized and less blatant such as her tension-filled percept of "bears" on Card VIII: "They're hanging onto somebody's hand and their tail is pushing down over there and their other hand is pushing down over there and the other one is doing the same thing."

Typical of the non-one-to-one children was clinical evidence manifested in G's behavior on the Rorschach of severe boundary disturbance similar to the snowman behavior described in the Piagetian tasks. She would touch the card as if she could feel the "butterfly," or smell it, or as in one case where she was showing the examiner how the percept of a person was split from "There (the top of the card) to there," and she pointed out into the middle of the room to delineate where the split ended.

In summary, the children who had not achieved one-to-one correspondence showed perceptual domination and rather concrete thinking in their cognitive functioning. In addition, there was evidence of severe boundary disturbance on the Rorschach which, although it was intensified by anxiety, did not appear to be caused by anxiety. The consistency of this boundary disturbance would imply that it results from a lack of structural development. A further interesting aspect of their functioning was the manifestation of earlier cognitive structures functioning simultaneously with the later operational ones on dichotomy.

2. Achievement of one-to-one correspondence

Following is a description of two of the subjects typical of the children who had achieved one-to-one correspondence. For the most part these children's functioning was typical of the relationship found between the cognitive and primary process variables. The children who will be discussed in this section are D and J who, although very different, are typical of the one-to-one heterogeneous group.

D. D was a ten year old boy who had been institutionalized two years ago with a diagnosis of "schizophrenic reaction, childhood type." As an infant he was described as being an unaffectionate child. His mother reported that after he had a high fever at the age of two and a half years he was never the same again. In addition, he was subject to frequent beatings as a baby by his father. By the time he was six and a half he had been hospitalized for trying to cut up a dog with a kitchen knife and diagnosed as a "childhood schizophrenic."

He was the strangest and saddest child that I tested. He was a slightly stocky, freckled-faced boy with brown hair. He talked to me of all the scary things he thought of but as he talked his face remained blank and impassive and there was a bizarre quality to his use of language.

D's overall cognitive average was 2.13. He achieved at a concrete operational level on one-to-one correspondence and conservation of matter. In seriation in which he achieved stage 2, he at

first used perceptual discrimination to select the appropriate sticks, but by the end of the task he had developed an appropriate system of organizing the sticks. He was also at a stage 2 level on class inclusion. On dichotomy he only achieved stage 1 because there was a perseveration in terms of color. He spontaneously classified the reds separately from the blues, but then his second division was the classification of the "Blue and Red" group versus the "Red and Blue" group, in which the groups were perceptually balanced against each other. When I switched a big blue square into the opposite group he said that was possible as long as I switched the big red square into the opposite group therefore maintaining the perceptual balance.

As long as D was focused on the actual physical task and questions directly related to how they looked he remained coherent and reality-oriented, but it was in his justifications that his thinking became egocentric and increasingly disordered. For example, on conservation of matter, after having responded appropriately that "No matter what way it's shaped it's still the same ball," he said that he knows this because, "I was taught that the counselors give out the same amount of food always." It seemed that appropriate conflict-free thinking could exist only temporarily, but was soon assimilated into his own idiosyncratic symbolic system where an inner theme of survival dominated.

D showed the highest amount of primary process material in

the Rorschach of all the children as well as the lowest defense effectiveness. The low defense effectiveness resulted from an extremely high defense demand resulting from one bloody percept emerging and flowing into the next and under this pressure only being able to maintain vague to poor perceptual organization. He was the only child where there was a fluid, unstable quality to his percepts.

Similar to justifications in his cognitive functioning, on the Rorschach there was an assimilation of adequate percepts into inner preoccupations with no attempt, or possibly ability, to differentiate the percepts and the associations. For example, on Card I, a "head" that "eats alive, eats people . . . scares people, cause it sucks their blood . . . " leads to a movie he's seen called "Carrie . . . I've seen it, it's rated X. I was in there with my mother . . . she got blood all over herself, all bloody."

D differed from the non-one-to-one children who fell near his cognitive average but had not achieved one-to-one correspondence, in that he did not show the severe boundary disturbance that they manifested on the Rorschach. For D, it was the thought process itself that became assimilated to a dominating internal theme. This internal theme then became the whole reality, blocking out the external reality. This was similar to the way he differed from the previously discussed children in terms of the egocentric intrusions into his

cognitive functioning. He differed from them in that it was not simply the materials of the task that became assimilated to the inner theme, but the thought process, the justification itself which also became assimilated.

J. J was another heterogeneous child who had not achieved one-to-one correspondence and whose functioning was congruent with most of the statistical relationships found between the cognitive and primary process variables although he was an exception in certain areas. He differed from D in the way he used fantasy to defend against anxiety.

He was a ten year old boy who had been institutionalized two and one half years previously. The psychiatric diagnosis had been of a chronic depression in a passive-aggressive personality, but the psychological had emphasized the underlying schizophrenic process. Very little was known of his early developmental history because he had been a foster child.

J was an extremely lovely looking, delicate boy with large dark eyes with long lashes. He was rather quiet and serious and rarely made eye contact. Occasionally, he would smile with embarrassed pleasure when something enjoyable occurred, like his being able to tell the tape recorder that he was the captain of Star Trek.

J fell on the lower end of the cognitive continuum with an overall average of 2.33. He achieved a solid concrete operational level of

thinking on one-to-one correspondence and class inclusion. On conservation of matter he at first showed concrete operational thinking, but was unable to maintain this when confronted by a counter-suggestion and reverted to a preoperational level of thinking: 'He's right. . . 'cause if there's more clay you could spread it more and make it bigger, and if there was only a little bit of clay you couldn't make it that big." However, this was the only break, the last two parts of the task he was able to maintain a concrete operational level of thinking even when he was confronted by a counter-suggestion.

On seriation, J was typical of the one-to-one heterogeneous children in that although he showed the ability to anticipate and organize accordingly, when it came time to placing the left-out-stick he reverted to trial-and-error and therefore only achieved at a stage 2 level. He was also typical in his use of an idiosyncratic classification schema on dichotomy. From the very beginning an idiosyncratic classification of "families" became the supra-category of all the other subcategories. He did make one spontaneous classification according to color, but when asked for a justification he responded, "'Cause this could be the mother and daddy (the large blue circle in the blue square) and this could be the two children (the small blue circle in the small blue square) and this could be the same thing over here (the red objects). After much pressing he said that the two families were different because they

were different colors. When asked to switch the classifications he eventually came up with two families who were different, "'cause the different families have different children." It was the same classification of objects as D's red and blue and blue and red, a classification that seemed popular with many of the children in this population and that Piaget describes as typical of stage 2 thinking. J even responded to my counter-suggestion of switching one member to the opposite group that I couldn't "'cause this one wouldn't have no children." He showed more ability than his score showed for classification, but the category for organizing the material was an idiosyncratic, rather well-elaborated concept that replaced the more conventional ways of categorizing.

J showed a low defense effectiveness on the Rorschach relative to where he was on the cognitive continuum. This was due, similar to dichotomy, to the way he would infuse a rich, ideational world into a rather vague, undifferentiated area of the Rorscach resulting in poor form responses. This low score of defense effectiveness was in contrast to his behavior which showed good defensive functioning in the minimal anxiety he displayed and his ability to maintain detached from his percepts on the Rorschach. He also showed a very low level of defense demand, the highest score being what Holt described as a "slight need for defense." This was because although J was involved in a very intense, rich ideational world the content and

its manner of expression were all relatively well-socialized and acceptable. For instance, a percept that was scored as having aggressive content was in response to Card VIII where there was quite a delay compared to previous perceptions, followed by: "I see something now; it looks like a porcupine or something." (?) "They was friendly." Basically, J seemed to be a child who had withdrawn into a rather rich, ideational world which acted as both a defense and his main source of gratification.

In summary, the heterogeneous children who had achieved one-to-one correspondence were typified by their fluctuating levels of cognitive organization and their tendency to form idiosyncratic classifications in the task of dichotomy. They no longer showed the type of boundary disturbance manifested in the non-one-to-one children's behavior on the Rorschach or the tendency of the non-one-to-one children to act on their disturbance rather than verbalize it; instead, their disturbance was manifested through distortion of the thought process itself.

## Concrete Operational Organization

The next two cases are the two children who were judged to be concrete operational. However, as will be seen in the analysis, only one of these children, P, actually shows a cognitive organization similar to the normal concrete operational child. V, the other child,

shows a cognitive organization more typical of a high-functioning heterogeneous child. They were both similar, however, in that both these children proved to be exceptions in their own way to the rules that had been found to govern the relationship between the cognitive and primary process variables.

1. V: a pseudo-concrete operational child

V was a twelve year old girl who had been institutionalized four years ago after she had threatened her mother with a knife. She was diagnosed as a "childhood schizophrenic with paranoid features." Unfortunately, there was a lack of information on her early developmental history.

She was a tall, beautiful adolescent girl with large, dark eyes, who looked more like she was eighteen than twelve. In fact, when I first saw her she teased me by telling me she was eighteen. She danced, sang, teased and exploded her way through the testing sessions, interacting with me in a hostile but extremely seductive way. Her behavior was one undifferentiated mass of oral, aggressive and sexual themes.

V achieved a concrete operational level of thought in all the tasks. However, certain aspects of her functioning pointed to her differing from a "normal" concrete operational child, specifically, the simultaneous functioning of earlier cognitive organizations with later ones. For instance, on dichotomy after having spontaneously

classified the materials according to color and shapes she created an idiosyncratic classification that suggested the simultaneous functioning of earlier structures. Group I contained the big blue circle and the big red circle as well as the small red square and the small blue circle. Group II contained the big red square and the big blue square as well as the small red circle and the small blue square. There was no name for it. However, unlike the other children previously mentioned who achieved idiosyncratic classifications, V was able to reclassify the materials, with a little prodding, into a third classification of size.

V's cognitive functioning seemed to be one long egocentric intrusion. The materials were constantly being assimilated into the sexual, aggressive and oral themes that preoccupied her. She was either molding the clay into an elephant shaped head or giggling because the sausage-shaped clay reminded her of first a "frankfurter" and then a "weenie," her word for penis. Although there was this inundation of egocentric intrusions she was always able to distance herself enough to come up with the appropriate justification. It would sometimes be preceded by a slightly strange one like: "I know, I'm smart. I was born in the house of smart people. They put my little baby from my belly button in a puck. And that's how I'm smart."

V was the major exception to the rule that the higher functioning children would show lower primary process density, high defense effectiveness, and a lower amount of formal deviations. Although

she was a concrete operational child, she was second only to D in the amount of primary process manifested on the Rorschach. She also showed very low defense effectiveness due to the deterioration of the perceptual organization of her percepts (F-) under the impact of overwhelming and at times extremely blatant sexual, aggressive and oral content to her primary process responses. She also had a penchant for unrealistic, organization of her percepts such as her response on Card VI: "It's a bat with a head, a person's head." (?) ". . . Here's his winkie (another of V's words for penis), bats are not supposed to have winkies, but mine's going to have one anyway."

2. P, a concrete operational child

P was a twelve year old boy who upon first being institutionalized three and a half years ago had been diagnosed as a "childhood schizophrenic." At this time he had shown himself to be a highly intelligent boy with a Full Scale I.Q. of 134, a Verbal I.Q. of 136 and a Performance I.Q. of 128. During the last year the staff had become worried because P had seemed to be deteriorating. An example of this deterioration had been in the results of a retesting with the WISC-R. His Full Scale I.Q. had dropped twenty-one points to 113, his Performance I.Q. had dropped thirteen points to 115, and his Verbal I.Q. had dropped twenty-five points to 109.

P was a thin, dark-haired boy. During the testing sessions he appeared to be a very alert and bright young adolescent boy who was highly anxious. He became extremely preoccupied and disturbed with my recording of his responses and eventually insisted on having the Rorschach given to him while he was under the table.

P is a good example of how anxiety can have a disruptive effect on the functioning of well-developed cognitive structures and how earlier cognitive structures can be used defensively. He was fully and solidly concrete operational in all the areas tested. In the beginning, however, on conservation of matter he had difficulty making the two balls of clay equal because of his obsessiveness. We finally agreed that the balls being "about the same" was acceptable. This agreement worked through two transformations of the clay balls during which he showed stable operational thinking. These were followed by his request that I come to his birthday party that day. When I refused and we returned to the task of saying that the two clay balls were equivalent there was a return to his focusing on the concrete, perceptual aspects of the task: "It's amazing how a little clay will make such a big difference." Again and again he attempted to make the balls even but without success. Twice, I had him stop, go on to another task and then return, but he was unable to agree that the two balls were equivalent so we were unable to finish the task. There was no doubt in my mind that he was concrete operational

in this task, but there was a regression to focusing on the perceptual aspects of the task as a result of anxiety.

Most of the few egocentric intrusions that P had, tended to be connected to some self-concept, for instance: "I'm weak," he said as he was rolling the clay into a ball. There was also one intrusion in which the animals in class inclusion were seen as ready to attack.

Although P did show appropriate defense effectiveness and the appropriate amount of primary process density for his cognitive level, he showed a rather high percentage of formal deviations for his age and cognitive level. In addition, there was a large discrepancy between his defense effectiveness score and the effectiveness of his defenses in dealing with anxiety that was manifested in his behavior. He had already shown considerable anxiety in his unease with my recording of his responses. By Card II on the Rorschach he became extremely agitated and did not want to continue because the percept was "too embarrassing, I'd be ashamed." As in conservation of matter we had to arrive at a compromise in which he would sit under the table in order to finish the Rorschach. At first he would only describe the percept to Card II to my tape recorder and would not let me listen, although he eventually did. Here, as in his cognitive functioning, P was overwhelmed by anxiety. For him, the formal deviations seemed connected to this anxiety: it was on Card II, which caused his flight to under the table, that his most distorted percept took place. His

percept was of a "half bug, half man, and those are heads and those suits . . . they're evil scientists . . . going to explode."

Once again, as in other children discussed, the discrepancy between his high defense effectiveness score and behavior is a product of his ability to maintain adequate perceptual organization under the pressure of primary process thinking. But the lack of emphasis on behavior in the scoring system fails to relay how effective or ineffective the defenses are in dealing with anxiety.

In summary, although V and P are the only children who were scored as achieving at a concrete operational level of thinking, it seems that P is the only child of all the children tested whose concrete operational thinking is near to what one would expect of a "normal" concrete operational child. For V none of the statistical relationships found for the primary process and cognitive variables held. This implies that although cognitive development is necessary for good defense effectiveness on the Rorschach it is not sufficient, there are other variables that influence the defensive structure and the density of the primary process responses. What becomes clearer when looking at P's functioning is how the defensive structure affects the ability of the cognitive structures to function. Anxiety can have a totally paralyzing effect. In addition, although there is a parallel development between a decrease in formal deviations and cognitive development, P demonstrates again how this relationship can be disrupted

and there can be an increase in formal deviations from anxiety.

3. A: an arrest of cognitive development

A was the third child who had not reached a concrete operational level of thought in one-to-one correspondence. I am discussing her separately from the other non-one-to-one children because although she is also one of the heterogeneous children whose functioning was congruent with the statistical relationship found between cognitive development, and defense effectiveness, density and formal deviations, other findings point to their being a deviation and perhaps even an arrest of aspects of her development rather than simply a delay.

A was a twelve year old girl who had been institutionalized two and a half years ago. Unlike the other non-one-to-one heterogeneous children there was an early onset of her disturbance: at the age of fifteen months she stopped talking. When she was three she was placed in the Bellevue school for autistic children, but she was discharged when she was five because they felt "nothing further could be done." She began to talk to her own when she was six years old. Her diagnosis over the years had ranged from "language lag, no sign of psychosis" to "childhood schizophrenia, autistic type with symbiotic features."

A was a rather heavy set girl who wore thick glasses. She seemed extremely shy and would avoid my eyes as much as possible. When she talked, which was as little as possible, there was a monotone quality to her voice.

She was one of the exceptions to the finding that even with these children cognitive level increased with age. She was one of the older children, but her cognitive average of 2.13 fell on the lower end of the cognitive continuum. This would point to there being an arrest of her cognitive development. She was also one of the more homogeneous of the heterogeneous children. She was at stage 2 in all the tasks except dichotomy where she achieved a concrete operational level of thinking. What was striking in her functioning on the cognitive tasks and differed from the other non-one-to-one children was her minimal use of language and its effect on her cognitive functioning. For A, thought was still not totally disconnected from action. Her justifications tended to be action-oriented rather than verbalized. For instance, when asked why the circles and squares in one-to-one correspondence were still the same amount when the squares made a longer line she responded by putting the squares on top of the circles to show me how they were the same. This differed from the other children who verbalized rather than enacted their arguments. She also differed from the other non-one-to-one children in her total lack of egocentric intrusions on both a verbal and nonverbal level.

A differed from the other children in her functioning on the Rorschach in that although she was on the lower end of the cognitive continuum she showed a relatively high level of adaptive regression

for this population. This was due to the ability when under the stress of primary process material to maintain an adequate level of perceptual organization as measured by the form level. She maintained this adequate form level by relying on stereotyped, conventional percepts (popular responses).

A was similar to the other non-one-to-one children in her concreteness and tendency to respond to the inkblots as if they were real. When a percept formed she seemed to feel she was discovering a reality: "I could tell they looked like babies" (Card III). Her tendency to use her body rather than, or as well as, inner language to express her thoughts as described in her cognitive functioning also occurred on the Rorschach. On the baby percept she put her hands over her eyes and then curled up in the chair to describe the baby which she said "gets me scared."

In summary, A differed from the other non-one-to-one children in that there appeared to be an arrest of her cognitive development rather than a delay. She also remained more action-oriented and less verbal and showed no egocentric intrusions into her cognitive functioning. Furthermore, there were islands of functions, for example, the ability to maintain stereotyped perceptual organization under the stress of primary process thinking. She was similar to them in the evidence of severe boundary disturbance that was manifested in her response to her percepts on the Rorschach.

# Chapter IV

# DISCUSSION

The finding in this study that the majority of the children tested showed a delay in cognitive development which was associated with certain problems of structuralization supports Beres' (1971) emphasis on the importance of looking at childhood schizophrenia within a developmental context. The following discussion will explore two points.

The first point to be discussed is that the level of cognitive structuralization that is inferred from the achievement of certain critical operations is indicative of internalization processes that result in certain overall structural changes that affect the child's affective as well as cognitive functioning. Specifically, the achievement of one-to-one correspondence indicates an important step in boundary differentiation which is crucial in the increased stabilization of the differentiation between the inner world of mental representations and the external object world. This increased stabilization of differentiation is important in the child's ability to maintain what Meyer and Caruth (1964) call external reality-testing during the expression of libidinal and aggressive wishes. There is also evidence that the structuralization implied in the achievement of one-to-one correspondence shifts the expression of

the disturbance from a problem of boundary differentiation to the symbolic system. Finally, it is hypothesized that there is a stabilization of affective functioning that seems to occur with the integration and coordination of operations that is achieved at the concrete operational stage of thinking.

The second point to be discussed is that the structural and developmental analysis of the functioning of these children gave rise to three different patterns of functioning which could be placed in three different diagnostic categories.

The following will be a discussion and elaboration of these two main points.

## Structural Development of the "Schizophrenic" Child

I would like to discuss the structural development of the heterogeneous "schizophrenic" child through an analysis of their functioning. I have organized the analysis around the task of one-to-one correspondence. The first part of the discussion will be an analysis of the structural organization of the children who have not achieved one-to-one correspondence while the second part will be an analysis of the structural organization of the children who achieved one-to-one correspondence. The underlying assumption is that in looking at the

pre-one-to-one structural organization and the post-one-to-one structural organization I am making a division that allows me to look at the process of structuralization itself. I have chosen one-to-one since both the statistical and clinical findings have led me to speculate that the achievement of one-to-one correspondence marks a qualitative structural change in the "schizophrenic" child.

## Structural Organization of the Children Who Have Not Achieved One-to-One Correspondence

The group of children who had not achieved one-to-one correspondence and class inclusion showed specific patterns of functioning that differentiated them both cognitively and affectively from the other heterogeneous children.

1. Cognitive organization

I would first like to discuss the children's functioning on the task of one-to-one correspondence itself. The children who did not achieve one-to-one correspondence achieved at a stage 2 level of functioning. They were able to make the original correspondence but when the perceptual configuration was changed they were not always able to maintain that even though the two sets looked perceptually different they remained the same in number. Therefore, it seemed that although the operational structures existed when there were gross perceptual transformations the earlier preoperational structures dominated.

The children's functioning on dichotomy can be understood in a similar way. According to Piaget, the normal order of succession of the tasks would lead one to expect that the children who had not achieved one-to-one correspondence would not have achieved any of the other tasks either. However, the three children who had not achieved one-to-one correspondence showed a simultaneous achievement of dichotomy. G and M's achievement of dichotomy, did however, differ from the functioning of "normal" stage 3 children in that although they were able to classify the objects according to color, shape and size, they also showed simultaneously the functioning of earlier cognitive organizations. Specifically, they both organized the shapes in what Piaget calls "collective objects" which are typical of stage 1 thinking.

These findings would point toward operational mechanisms of thinking having developed which exist simultaneously with earlier cognitive organizations. There is a lack of domination in the functioning of the operational structures. In one-to-one correspondence this results in the fluctuations between stage 2 and stage 3 thinking while in dichotomy it results in the simultaneous existence of stage 1 classifications with stage 3.

I would also speculate that one reason the children do better on dichotomy than the other tasks is that the child's actions (sorting the objects) result in perceptual alterations that support the classification

process. In other words, in dichotomy the operational structures are supported by the earlier organizations including sensory-motor activity inherent in the sorting process itself. In the other tasks, except seriation, the earlier structures are in conflict with the later ones, i.e., the perceptual understanding of the tasks are in conflict with the abstract understanding. In seriation, although the perceptual aspects of the task are congruent with its achievement, the quantity of the material and the difficulty in making perceptual discriminations forces the child to rely on the earlier cognitive organization of the tasks and therefore the tendency is to focus on its perceptual aspects.

In summary, the non-one-to-one children demonstrate the simultaneous existence of different levels of cognitive organization that are developmentally determined. The use of actions on objects as one way of understanding the world in their cognitive and, as will be shown later, affective functioning points toward their still being vestiges of sensory-motor organization of thought functioning. It seems that when the non-one-to-one children are confronted with an event there is an activation of the different organizations. One might speculate that when these organizations are in conflict the earlier (developmentally) ones tend to dominate having achieved a certain level of structural integration that the later ones have not yet achieved. However, at times the later modes can dominate when they are not in conflict with the earlier ones, and, in fact, when the

earlier organizations support the later ones.

2. External reality-testing

There is an interesting parallel to the lack of domination of the operatory structures in the findings on defense effectiveness and the meaning of these findings for external reality-testing.

Meyer and Caruth (1964) make a distinction between external and internal reality-testing which is of interest in an interpretation of the defense effectiveness findings. External reality-testing is conceptualized as the process of perceiving external reality as measured by the form level on the Rorschach and is distinct from internal reality-testing which is conceptualized as the ability to evaluate realistically the accompanying fantasy to the external reality.

The findings on form level that there was no difference between the children who had achieved one-to-one correspondence and the children who had not achieved this task would lead me to speculate that the structural differentiation necessary for the accurate perception of external reality had already occurred.

The findings on defense effectiveness are interesting in that they demonstrate the vulnerability of these structures to libidinal and aggressive wishes. The non-one-to-one children showed significantly poorer defense effectiveness (DE) scores than the children who had achieved one-to-one correspondence. Although according to Holt's (1970) manual the scoring of DE includes the

affective as well as the clinical assessment of the child's behavior, a close examination of the DE scoring showed it to be mainly determined by the form level of the percept when the content and, or the structure of the response was judged to fall within the primary process continuum, i.e., those percepts which are organized around the expression of libidinal and aggressive wishes. Therefore, it would seem that the structuralization signified by the achievement of one-to-one correspondence is important in the ability to maintain external reality-testing. The findings imply that although the differentiation between the inner world of mental representations and the external object world has occurred in the children who have not achieved one-to-one correspondence, there is a vulnerability to this differentiation being lost and a disruption of the ability to accurately perceive the external world.

It is interesting to look at these findings on cognitive organization and external reality-testing together. In both areas there is the development of the later structures necessary for an accurate appraisal of reality. But one might speculate that in the "schizophrenic" child, the continued existence and functioning of the earlier structures results in a vulnerability to disruption of the functioning of the developmentally later structures.

3. Cognitive organization and boundary differentiation

The existence of the sensory-motor organization of thought was

also evident on the Rorschach in the children's tendency to sniff and touch the inkblot. These activities would imply problems in maintaining object permanence as seen in the object's existence still depending on the subject's actions upon it and therefore not totally differentiated from it. This, as well as the non-one-to-one children's responding to their percepts on the Rorschach as if they were real, i.e., there was a loss of differentiation between the percept -- the butterfly -- and the stimulus -- the inkblot -- supports a view that the children who had not achieved one-to-one correspondence showed severe boundary disturbance. There was a frequent use of sensory-motor activity to establish the differentiation between the inner world of mental representations and the external object world.

This problem of differentiation also led to thought frequently leading to action. For instance, G's searching for the scarf of the snowman showed a difficulty in distinguishing the thought of an object from its reality. Along with this problem of differentiation was a tendency to allow the inner representational world to dominate in the child's interactions with reality. In Piagetian terms, external reality was frequently assimilated into the internal reality.

4. Summary

In summary, the heterogeneous children who have not achieved one-to-one correspondence show an extremely wide range of functioning which would imply that structuralization has proceeded but without the

simultaneous subordination of the developmentally earlier structures which has resulted in the simultaneous existence and functioning of different levels of structural organization. The earliest organization appears to be vestiges of the sensory-motor organization and an associated problem in differentiating the inner representational world from the external object world. One might speculate that the existence of this earlier more undifferentiated organization creates a vulnerability to the loss of the distinction between the inner representational world and the external object world which results in the poor external reality-testing (DE) during the expression of libidinal and aggressive wishes on the Rorschach.

## Structural Organization of the Children Who Have Achieved One-to-One Correspondence

### 1. Cognitive organization

The achievement of one-to-one correspondence signals significant structural changes as well as bringing with its its own set of problems. An examination of the cognitive patterns of achievement of this group of children illuminates some of the new developments at this stage. In particular, the one-to-one children's functioning on dichotomy is of interest.

The one-to-one children who did achieve stage 3 on dichotomy showed a similar pattern to the non-one-to-one children showing evidence of earlier cognitive organizations functioning simultaneously

with the later ones. However, these earlier cognitive organizations were no longer the stage 1 thinking such as the complex objects described for the non-one-to-one children, but were perceptually balanced classifications typical of stage 2 thinking. Therefore, although there was the same pattern of the earlier cognitive organization functioning simultaneously with the later ones, the type of earlier organization that was functioning was evidence of further cognitive development. It is interesting to note that this within-task development of the earlier cognitive organizations parallels the increase of minimum Piagetian stage with age that was found in the overall cognitive development.

The most frequent pattern of non-achievement of this task was that the children achieved two spontaneous classifications one of which was frequently size. It is interesting that size is a classification that Piaget (1964) describes as normally following the classifications of shape and color. This would point toward the different ways of classifying being developed, but that there has been some interference in the ability to organize and choose the appropriate classification.

Another point of interest was that frequently the heterogeneous children had most difficulty with seriation. Quite frequently it was the lack of achievement of this task that kept them from being scored concrete operational. The heterogeneous children were often able to approach the task of seriation in a well-organized and well-planned

way. The part of the task they had most difficulty with was when they were to place the left-out-stick in the already completed seriation. According to Piaget (1965), the concrete operational child will spontaneously place the stick approximately in the correct place in the seriation. However, with the heterogeneous children when it came time to place the stick they resorted to trial-and-error, comparing the stick to each member of the seriation until they found the appropriate place.

One thing that seems to have occurred with the achievement of one-to-one correspondence is that it is associated with the "disappearance" of the earlier cognitive structures seen in the non-one-to-one children's functioning on dichotomy. Thought seems to have become disconnected from action wich one might speculate enables the domination of operational thinking in one-to-one correspondence. A continued problem is the continued lack of reliance on the later cognitive structures, in particular the system of signifiers that would be used to achieve seriation. Therefore, in seriation rather than using operational thinking the child resorted to the earlier cognitive structure using trial-and-error to place the left-out-stick.

Bettelheim (1967) described a similar phenomenon in his attempt to explain the discrepancies in cognitive functioning of the autistic children that he worked with. He emphasized the autistic child's need to contimually reestablish object permanance because,

although they had developed the cognitive structures necessary for object permanence, there was a lack of "belief" in the functioning of these structures which resulted in stressful times in a need to continually reestablish object permanence. The heterogeneous children of the present study seem to have developed further than Bettelheim's population yet show a similar difficulty in relying on their operational structures.

2. External reality-testing and boundary differentiation

Another significant change was the increased defense effectiveness score with the achievement of one-to-one correspondence. The one-to-one children were more able to maintain adequate form level when the content and, or structure of their responses on the Rorschach fell within the primary process continuum. Therefore, there seems to be a stabiliziation of external reality-testing during the expression of libidinal and aggressive wishes.

Another occurrence was the disappearance of the touching, smelling, etc. of the percepts as if what they represented might be real. This would signal both a disappearance of the sensory-motor mode of organization along with increased differentiation between the inner world of mental representations and the external object world. It remains unclear whether the "disappearance" of the sensory-motor mode of organization is due to: (1) its subordination to the later cognitive organizations in which case it is still capable of

functioning; (2) a disappearance of this organization altogether because of its lack of use; or (3) the integration of this earlier organization into the later ones which brings about a new organization.

3. Summary

In summary, the achievement of one-to-one correspondence appears to mark significant structural changes. First, I will speculate that the achievement of one-to-one correspondence marks the achievement of structural closure. Important in this structural closure is the cessation of functioning of the sensory-motor organization and an associated "disappearance" of the type of boundary disturbance manifested in the non-one-to-one children's functioning when they showed difficulty in maintaining the distinction between the inner representational world and the external object world. Secondly, the disappearance of these earlier structural organizations appear to be associated with a stabilization of external reality-testing. These children are more likely to maintain adequate external reality-testing during the expression of libidinal and aggressive drives. Therefore, one might speculate that the final differentiation of thought from action which is seen in the disappearance of the sensory-motor organization of thought is associated with the child's increased differentiation and the stabilization of the differentiation of the inner representational world from the external object world. This in turn is crucial in the child's ability to maintain adequate

external reality-testing during the expression of libidinal and aggressive wishes.

Although these developments close off certain structural vulnerabilities there is still the existence of different levels (developmentally determined) of structural organization that function simultaneously with each other. However, now these children tend to rely on rather concrete, perceptually dominated modes of thinking rather than the earlier sensory-motor modes. This was seen both in their functioning on the cognitive tasks and in fabulized combinations being the most frequent type of thought disorder on the Rorschach. Rapaport writes that what appears to lie at the core of the fabulized combination is that "a spatial relationship in the inkblot is taken as an immutable real relationship" (p. 433). One can understand this as the perceptual relationship being interpreted concretely rather than conceptually. Therefore, one might say that although the achievement of one-to-one correspondence is associated with the stabilization of external reality-testing there are still severe problems of reality-testing. Although the children are no longer so vulnerable to the loss of an accurate perception of external reality one problem that remains is of the accurate interpretation of events that have been accurately perceived.

## Boundary Differentiation and Egocentric Intrusions

I would like now to go more deeply into the relationship between

the increased differentiation of the child with the achievement of one-to-one correspondence and the effects of this differentation on the development of the system of signifiers as described by Piaget. A development in this area can be seen in the difference between the non-one-to-one children's and the one-to-one children's egocentric intrusions on the task of dichotomy. A comparison of G's, the non-one-to-one child's, egocentric intrusion of a snowman with J's, a one-to-one child's, egocentric intrusion of "families" elucidates some qualitative changes. G's ability to see the collection of circles as a "snowman" demonstrates the beginning of the ability to symbolize: in Piagetian terms the beginning of a system of signifiers. The idiosyncratic nature of the signifier is evidence of it being part of the "symbolic" system which Piaget defines as a private, idiosyncratic system of signifiers as opposed to "signs" which are more socialized signifiers represented by language (Piaget & Inhelder, 1969). What is lacking in G's functioning is the ability to maintain the distinction between the sign and what it signifies: she searches for the snowman's scarf. This implies a problem of boundary differentiation. It is only when the distinction is maintained between the signifier and what it signified which parallels the distinction between the inner representational world and the external object world that the internal system of symbols becomes a persistent entity in itself that can be elaborated and modified and take on a "reality" of its own that remains distinct

from the external object world.

This is true of J's egocentric intrusion of "families." With J the intrusion was an elaborated symbolic system -- a fantasy -- to which the cognitive task became assimilated. He was similar to G in that it was the inner representational world that dominated in reality, but he was dissimilar in that he was able to integrate the cognitive task and the fantasy by assimilating the task to the fantasy.

One can understand the egocentric intrusions as being a manifestation of a symbolic system that the child uses in interaction with the world. There are significant changes in the symbolic system with the achievement of one-to-one and the associated stablization of differentiation between the inner representational world and the external object world. Previous to these changes there was a tendency to act rather than delay that was associated with a sensory-motor mode of interaction with reality and a lack of differentiation. The achievement of one-to-one is associated with the internalization of the sensory-motor organization and an associated increased differentiation which I would speculate not only results from the development of the system of signifiers but also spurs on the development of the symbolic function. This egocentric symbolic system is used as a major mode of interacting with reality whether it be in the cognitive tasks or in interpersonal relationships.

The structuralization that is signalled by the achievement of one-to-one correspondence brings with it new ways for these children's disturbances to be expressed. The thought processes are now vulnerable to being assimilated into this newly elaborated symbolic system and there is more vulnerability to the cognitive processes being intruded into and at times distorted by the symbolic system. This can be seen as one reason for the poor cognitive functioning on dichotomy which is seen in only four out of nine one-to-one children achieving this task. Some interesting and supporting evidence to this description of the effects of cognitive development bringing with it the development of a symbolic system which can be disruptive and distorting of the thought processes is found in McLaughlin's (1976) study. She found that it was the children who were more advanced cognitively whose cognitive functioning was intruded on by the emotional content of the tasks, while the less advanced children who she placed on the autistic end of the continuum did not show intrusions into their cognitive functioning because of the emotional content of the tasks. These findings can be explained by the effect of the development of the symbolic system on the cognitive processes. The stabilization of the differentiation between the inner representational world and the external object world and the resulting development of the symbolic system brings with it an increased potential for the disruption and distortion of the cognitive processes.

The development and elaboration of the symbolic system also creates new defensive possibilities for the one-to-one children. This can be seen in J's case where he was able to withdraw into his fantasy world to escape anxiety, and, or a threatening external reality. The children who had not achieved one-to-one correspondence did not have this choice, since there had not been sufficient differentiation to allow the elaboration of the symbolic system.

As with most things the use and development of the symbolic system is complicated and at times seems contradictory. I would speculate that similar to Freud's (1911) discussion of the function of hallucinations and delusions in psychosis, that the symbolic system is not only used to avoid reality but to also make contact with it. These children seem to feel safest in interacting with reality by assimilating reality to what they are most familiar with, in this case their inner fantasy world. Schmid-Kitsikis (1973) described this assimilative tendency in her description of the children's tendency to change the material to negate the conflict in the cognitive task. One might surmise that one major way for these children to maintain stability is through the assimilating of the external world into their own symbolic system.

A further point is that the more unstructured the situation the more the intrusion of the egocentric thinking occurs. In the cognitive tasks this seemed to be when the material was malleable as in the clay

in conservation of matter, or when the process itself as in the need to organize the objects themselves as in dichotomy.

This way of organizing and interacting with the world can be seen as another organization that is in conflict with the use of the operatory structures.

## Implications of the Findings on the Heterogeneous Children and the Achievement of One-to-One Correspondence

### 1. Effects of structuralization

The first point I would like to make is that the heterogeneous children show a delay in structural development. Although there is the development of more advanced structures, the delay in the subordination of the more undifferentiated sensory-motor structures cause a vulnerability to fluctuations in functioning to an early undifferentiated stage of being and interacting with reality. This in turn seems to create a lag in the child's ability to shift his reliance to the later structures. Specifically, there is a delay in the child shifting from a sensory-motor mode of interacting with reality to the use of signifiers as the way of interacting with reality. Although the structuralization that is signified by the achievement of one-to-one correspondence does signal a crucial point in internalization and the increased differentiation of the child, they still tend to rely on a concrete, perceptually bound interaction with reality and are not able to make the full transition to a reliance on operational mechanisms of thought typical

of the concrete operational stage of thinking.

The second point I wish to make is that the new structural organization that occurs with the achievement of one-to-one correspondence does not eliminate the severe disturbances these children demonstrate but allows them to be expressed in different ways. Specifically, there is a decrease in the type of boundary disturbance and lack of differentiation between thought and action that characterized the non-one-to-one children. However, at this point the reasoning process itself becomes affected by the disturbance. This can be seen also in the statistical finding that the higher the cognitive level the more likely primary process thinking would be manifested through distortions of language.

The third point which I have implied but would like to emphasize is that there appears to be a relationship between the level of boundary differentiation and the level of cognitive development. The existence of the sensory-motor mode of interacting with reality appears to be associated with the lack of a consistent differentiation between the internal world of mental representations and the external object world. In these heterogeneous children the development and functioning of the later operatory structures at times masks these structural vulnerabilities to an earlier level of differentiation. It is only with the structural closure that occurs with the achievement of one-to-one correspondence that a higher level of differentiation is

achieved. The problems that remain are on a higher developmental level where there is a problem in interpreting reality and where the interpretation of reality is often determined by libidinal and aggressive preoccupations.

2. Some speculations on some of the factors contributing to the delay of structuralization.

Two interrelated questions must be raised. The first is what causes the slowing down of the structuralization in these children. The second is if it is true they never achieve the structural closure associated with the concrete operational stage of thinking how do these children stay in some form of psychological equilibrium with the environment. The relatedness of the answers to these two questions lies in my speculation that it is the way these children remain in equilibrium with the environment that is responsible for the slowing down of progressive cognitive development.

Before preceding, I would like to briefly review Piaget's conceptualization of equilibrium and the role it plays in the development of the cognitive structures. He believes that it is the need to remain in some sort of psychological equilibrium with the external environment that is behind the development of the cognitive structures. He conceptaulized the equilibration process as "the compensation resulting from the activities of the subject in response to external intrusion" (1968, p. 101). The external intrusions are events that occur in external

reality that are in conflict with the child's way of understanding, or to put it in Piagetian terms, the schemata applied to the external event. This conflict creates a disequilibrium. The principle of equilibrium explains the way the cognitive structures accommodate (modify) themselves to the external event while the external event becomes assimilated (modfied) to the cognitive structures. It is this process of equilibration that returns the cognitive structure to a state of equilibrium as well as resulting in further cognitive structuralization.

The slowing of structuralization and uneven cognitive development that these children demonstrate is probably multi-determined. It seems very likely that there are problems from the very beginning that effect what Annemarie Weil (1976) calls the "basic core" and has an important effect on the lack of structural integration. However, I have chosen to discuss certain tendencies manifested in the current functioning of these children that further impede structuralization since there is more observable material to draw on.

The major tendency I wish to discuss is that the heterogeneous children have developed a number of mechanisms that interfere with the resolution of cognitive and affective conflicts through progressive cognitive development. As was stated previously, it is through the resolution of cognitive conflicts that cognitive development occurs. If there is a tendency to negate these conflicts in ways other than progressive cognitive development this will have a retarding effect on

structuralization. The tendency of many of these children to show anxiety and distress when confronted by a counter-suggestion, or when asked to justify their answers, implies that they become unusually uncomfortable when it becomes clear that there is a contradiction between external reality and their own beliefs. One hypothesis might be that the ability to recognize a contradiction between a belief (schemata) and an event in the external environment implies some comfortableness with the experiencing of the world as different and therefore separate. I would speculate that these children's delay and therefore difficulty with the whole area of spearation makes the recognition of conflict, whether it be cognitive or affective, an unusually anxiety-ridden and painful experience. They therefore use mechanisms to negate these conflicts which in turn interfere with progressive cognitive development.

A major conflict-avoidance mechanism that has already been discussed is the children's strong assimilative tendency. What Schmid-Kitsikis noticed on a behavioral level in the children's changing the material to negate the cognitive conflict (1973), also happens on a psychological level. The "intrusion" from the external environment is frequently dealt with by the assimilation of the external fragment of reality into the symbolic system. This creates some form of equilibrium and associated stabilization by negating the conflict and moving the child away from a painful external reality to "a world of

magic and relative safety" (Pine, 1974, p. 151). At the same time, however, there is no longer the necessity of the resolution of cognitive and affective conflicts through progressive cognitive development which interferes with structuralization.

The assimilative tendency is also evidence of the focusing of much of their attention on the inner world as opposed to the outer world. The inner fantasy world contains a "reality" which the external environment seems to lack. This can be seen as another reason for the delay in structuralization. In normal development the external environment is cathected when there is little internal tension or stress. I am using cathected here to refer to a focusing of attention. It is during these times of calm that exploration of the environment through the manipulation of objects lays the groundwork for operational thought. If for some reason this exploration is interfered with it will take many more experiences with the external environment before there can be a consistent internalization of the action-schemata. The cathecting of the internal world can be seen as associated with a decathetcing of the external environment and therefore one more factor in the delay of structuralization.

The lack of integration of the different levels of cognitive organization is another factor. The presence of the different levels of organization make it as possible for these children when they are confronted with a cognitive conflict to regain equilibrium through a

cognitive "regression" as a cognitive progression. They are as likely to focus on the perceptual, static aspects of a task as they are to focus on its transformations. In a sense, cognitive "regression" has been built into the cognitive system.

## Diagnosis from a Structural and Developmental Perspective

The second major finding that I wish to elaborate upon is that the two different structural organizations of these children (heterogeneous and concrete operational) when viewed within a development context, gives rise to three different groupings of these children: (1) the heterogeneous children who showed a delay of structuralization; (2) the heterogeneous children who showed an arrest of structuralization; and (3) the concrete operational children. These three different groups can be conceptualized as three different pathological and therefore diagnostic entities. The following will be a discussion of the three major diagnostic entities that arose from this study.

### The "Chronic Ego Deviancy" of the Heterogeneous Group

The analysis of the effects of cognitive development on the control and expression of primary process thinking was based on the patterns of functioning of the heterogeneous group of children who had been

diagnosed as "schizophrenic." I would now like to hypothesize that this group falls within the category of "borderline" that Fred Pine (1974) describes in an article in which he has applied a structural and developmental approach to this category of children.

The point of view of the present study is similar to Pine's conceptualization of borderline phenomena. "The core idea to be developed is that genetic considerations, the presence of developmental arrest or aberrant development (principally in the spheres of ego functions and object relationship), give unity to the divergent phenomena in the borderline domain" (p. 342). These developmental aberrations were seen in the functioning of the heterogeneous children where the delay in structural development was described as affecting both the level of object relations in the heterogeneous children's vulnerability to a less differentiated organization, and various other ego functions such as the children's reality-testing, thought processes and defensive functions.

Furthermore, the heterogensous group fall within the category that Pine describes as the "chronic ego deviance" group. "These children lack the basic <u>stabilizers</u> of functioning that other children acquire: a reliable anchor in external reality and in patterned object relationships that give the child shape, and an array of intrapsychic defenses reliably set into position when anxiety is aroused" (p. 348).

The implications of the present study for the chronic ego deviance group of borderline children is that the lack of stability in their functioning results from a particular structural organization in which there is a lack of the subordination of earlier structural organizations to later ones. This results in what Pine describes as "a mixed bag of varying levels of ego functions, drive level, and object relationships." In addition, these children's "failure to establish a solid hierarchy in their ego states and functions, their form of object relations and their drive organization" (p. 351) can be seen as resulting from the lack of structural closure associated with the children not having achieved the concrete operational stage of thinking.

## The Concrete Operational Stage of Thinking and Its Diagnosic Implications

I would like to generalize from P's functioning. Even though these generalization are based on one child's functioning, it seems important to at least make hypotheses that future studies can explore and develop. I will focus this discussion on two questions: (1) the effect of the structural integration associated with the concrete operational stage of thinking on the child's functioning, and (2) the diagnostic implications of this structural organization.

### 1. Structural organization

First of all, it is unclear whether the majority of children tested

ever do reach the concrete operational stage of thinking as P did or whether they remain operational in many areas but never achieve the integration and coordination of operations that is achieved at the concrete operational stage of thinking. Even though statistically there was increasing cognitive development with age, this simply points to more and more cognitive areas becoming operational. P was the only child in the study who achieved a concrete operational stage of thinking similar to the normal children described by Piaget.

One implication of the findings is that the integration and coordination of operations that occurs with concrete operational thinking brings with it a stabilization of functioning that was lacking in the children who were not at a concrete operational stage of thinking. For instance, cognitively P did not show the presence of earlier organization existing simultaneously with the later ones in the way described for the heterogeneous children. He showed one "break" on conservation of matter in which he focused on the perceptual aspects of the task and was unable to continue. This "regression" was not the same as the "fluctuations" in functioning that the heterogeneous children demonstrated. In the fluctuations of the heterogenous children the understanding of a task through an early organization was equally congruent with the understanding of the task through a later cognitive organization. For P, the focusing on the perceptual aspects of the task made it impossible for him to continue. In this

clinical vignette the earlier organization was used as an obsessive defense, not only simply as another way of understanding reality. The qualitative difference in his functioning was that there seemed to be a clear separation of the different organizations, the earlier organization being set into motion in response to anxiety. It was not the almost arbitrary fluctuations between cognitive organizations that the heterogeneous children showed.

One way of explaining the stabilization that occurs is that the integration and coordination of operations that occurs at the concrete operational stage of thinking results in the subordination of the earlier cognitive organizations. One might hypothesize that with each new structural organization there occurs a simultaneous integration and coordination of the earlier structures into the new structures which results in a hierarchical arrangement similar to what Klein (1970) described for the primary and secondary processes. He described them as terms that were applied to the different levels of organizations of thought that were arranged on a continuum, the primary process mechanisms being inhibited by the functioning of the secondary processes. It seems that in an analysis of the concrete operational thinking of P one could hypothesize the integration and coordination of thought that occurs with the concrete operational stage of thinking acts to simultaneously inhibit the earlier organizations and results in an increased stabilization of functioning. In addition, this struc-

turalization brings with it the capacity to use "regression" to the earlier organization defensively. This would imply that with the heterogeneous children there is a lack of the inhibitory mechanisms associated with the concrete operational stage and this in turn is responsible for the fluctuations in their functioning which has been labelled as a lack of structural development.

One last point I would like to raise is that even with the structuralization that occurs with the concrete operation stage of thinking it seems that very severe pathology continues to exist and in fact becomes integrated into the higher level of structural organization. In P's case the regression to formal deviations in his thinking can be seen as having a specific defensive function which has become part of the total structural organization. Therefore, I would hypothesize that the type of difficulty he demonstrates is not so much the uneven development of the defensive structure as in the heterogeneous children but the integration of psychotic defense mechanisms into the overall structure.

2. Diagnostic implications

Diagnostically, P can also be seen as falling into Pine's (1974) conceptualization of a borderline child. His regression to an earlier level of functioning would coincide with Pine's emphasis on the borderline child not having achieved a stable hierarchy of functioning.

The level of structural organization implied in the concrete operational stage of thinking and P's more regulated regressions would place him in what Pine described as the "shifting levels of ego organization," a diagnostic category that has been studied extensively by Ekstein and Wallerstein (1954).

In "these children, a true ego organization has been achieved but at least two different levels." They differ from the chronic ego deviance of the heterogeneous children in the "totality of the shift that takes place in their ego organization" (p. 351). I would speculate that the achievement of this "true" ego organization is associated with the achievement of a concrete operational stage of thinking, and that this structural organization makes possible the shift from a "reality-oriented, though often painfully troubled world to a world of idiosyncratic fantasy. . . " (p. 352).

The defensive nature of this shift which was described for P is also described by Pine. Pine emphasizes that the total shift to a more psychotic-like state deals with anxiety "'successfully' though in a highly maladaptive way. . . Thus I would emphasize the organized <u>defensive</u> function of the total shift, a shift away from painful inner or outer reality to a world of magic and relative safety" (p. 352).

The implication of the present study would be that the achievement of the concrete operational stage of thinking in children who show psychotic-like symptomatology is associated with the crystallization

of functioning into at least two different levels of organization. The main way these children maintain psychological equilibrium with the environment and sustain this structural organization is through the defensive use of the earlier, more psychotic-like organizations of thinking. In this way there is a total structural integration achieved with the concrete operational stage of thinking, but one that is distinctly different from that shown by normal concrete operational children.

## An Arrest of Cognitive Development and Its Functional and Diagnostic Implications

It is of interest that of all the children tested, A stood out as the one with the more typical history of an autistic child. I would hypothesize that the children who fit the more autistic description are structurally different from the other children. I will use A to describe this different structural organization.

Two aspects of A's functioning stood out from the other children. The first was her rather high age in comparison to a rather low cognitive score. The second, and most interesting aspect of her functioning, was in the implications of her minimal use of language, her reliance on action, the lack of both verbal and nonverbal egocentric intrusions, and, unlike the other children who had not achieved one-to-one correspondence, the lack of stage 1 thinking on dichotomy.

The first finding points to an arrest of cognitive development. The second grouping of interrelated findings provides information on

the type of structural organization that is associated with the arrest of cognitive development.

I would like to speculate that the second group of interrelated findings point to A having developed later operational structures, demonstrated in her achievement of dichotomy, similar to the heterogeneous children, but that there was also an earlier level of organization that was still in existence that was fully sensory-motor and did not show the beginnings of the development of a system of signifiers. Let me be more specific. The two other non-one-to-one children had shown egocentric intrusions and stage 1 thinking in the form of complex objects on dichotomy, as well as verbal justifications on the cognitive tasks. A showed none of these. I would speculate that in the non-one-to-one children's functioning the complex objects demonstrated on dichotomy as well as the egocentric intrusions show the beginning of the ability to signify albeit on a very primitive and still relatively undifferentiated level: the signifier exists but it has not as of yet become consistently differentiated from what it signifies. A's lack of signifiers would point to there being an arrest of development at the sensory-motor stage within this earlier organization. In congruence with the previous discussion this would be associated with a very early undifferentiated stage of object relations. Therefore, both A's object relations and cognitive functioning is affected by the arrest of development of this earliest level of structural organization.

There has not been sufficient differentiation at this level for the achievement of object permanence which would result in the beginning of a system of signifiers, nor for the differentiation of the inner representational world from the external object world.

It is interesting that A is able to maintain external reality-testing through continued development of the operational structures that tend to function in rather stereotypical and conventional ways to maintain the child in some sort of equilibrium with the environment. A's relatively high adaptive regression score points to this stereotypical use of operational structures allowing some control of the expression of libidinal and aggressive wishes.

A differs from the borderline children in the large discrepancy between these two levels of organization. The chronic ego deviance group was described as showing fluctuations in functioning. The gradual development of the organizations responsible for the fluctuations would lead me to speculate that there is some interaction between these two levels of organization which allows enough conflict to emerge to result in some, although limited, structuralization. P, as an example of the shifting level of ego organization group of children, showed the integration of the earlier organization in the later organization and its defensive use, again showing some interaction between the two levels. A, on the other hand, shows that the earlier level remains untouched by the later levels and therefore, I would

speculate, does not develop. In fact, it is as if the development of the veneer of stereotypical, conventional functioning had allowed the more primitive aspects of her thinking to remain untouched.

## Areas of Interest for Future Research

Although the present study includes quite a few speculations about how the functioning of this population of disturbed children would compare with a normal population it seems essential for a future study to do a comparison between normal children and a disturbed population. It would be interesting to see if normal children who had not achieved one-to-one correspondence would show the same relationship with the defense effectiveness score as in this population and if they would also show the related problems of boundary differentiation as the non-one-to-one heterogeneous children have shown. In addition, it would be important to explore further the seemingly small amount of primary process thinking of this "schizophrenic" population as compared to the normal population. Another question that should be explored in the comparison with normal children is the nature of the early structural organization that was found to function simultaneously with the later structural organization. What exactly is this early structural organization? Is it particular to this population of disturbed children or would you find it in the normal population? What function would it have in

the normal population?

Another area for future research would be a longitudinal study in order to trace the structuralization process in schizophrenic children and see how it differs according to the different diagnostic categories the children are grouped within. Does a child like P, the concrete operational child, go through structuralization similar to the heterogeneous children or does he go through a different process? Do the heterogeneous children ever reach a concrete operational stage of thinking? If they do, is it similar to P in there being an integration of their fluctuating organization into a new organization where regressions to an earlier, more undifferentiated states is used defensively, or is it a different organization?

And finally, one last area that is extremely important if this kind of research is going to help the children we study, is to look at the effect of therapy on these problems of structural organization. One question to be asked is if therapy can have any effect at all on these problems of structural organization. A second question is if different types of therapy will have different kinds of effects. Will a more structural, ego supportive therapy be more effective, or would a therapy in which the child is allowed to regress to these early, unresolved areas be more effective?

# Chapter V

## SUMMARY

The purpose of this study was to gain more understanding of the structural organization and development of children diagnosed as "schizophrenic." In order to do this a Piagetian analysis of the structural organization of the cognitive sphere of functioning was done and compared to the children's primary process thinking.

Modern psychoanalytic theorists had emphasized that primary process thinking as well as secondary process thinking went through a process of structuralization. Most recently, the structuralization of primary process thinking was seen within the context of the self/other differentiation of the individual. Empirical studies had found a relationship between the development of cognitive structures and primary process thinking in normal development. In addition, other studies had found uneven cognitive development in children who had been diagnosed as "schizophrenic." There had been no studies that looked at the relationship between cognitive development and primary process thinking in children diagnosed as "schizophrenic."

The main purpose of this study became the exploration of these disturbances in cognitive development and what, if any, their relationship was to "psychotic" thinking as manifested in primary process thinking. The basic premise was that the disturbances in cognitive

development would be associated with disturbances in thinking as seen in the children's primary process functioning. Furthermore, there would be an underlying problem in self/other differentiation which would be reflected in their level of cognitive development and primary process thinking.

The sample consisted of fourteen, eight to twelve year old children who chronologically should have reached a concrete operational stage of thinking. They had all been placed in a residential treatment center with a diagnosis of "childhood schizophrenia" or "ego deviant with underlying schizophrenic process."

Originally, each child was to receive five of Voyat's Piagetian tasks which would be used for an analysis of each child's cognitive level and organization, and the Rorschach which would be scored by an independent clinicain using Holt's method of analysis in order to elucidate the quantity and quality of each child's primary process thinking. However, because of a strike the collecting of the data was terminated when fourteen children had been given the Piagetian tasks but only eleven of these fourteen had been given the Rorschach. Therefore, the findings on cognitive development are based on fourteen protocols while the findings on primary process thinking are based on only eleven.

The children were divided into three cognitive groupings. They were considered preoperational if they were stage 1 on all five tasks,

concrete operational if they were stage 3 on all tasks, and heterogeneous if they were at different stages in different tasks.

Ten hypotheses were tested. The first three were aimed at reduplicating previous studies on the cognitive development of "schizophrenic" children. They stated that: (1) "schizophrenic" children who chronologically should be at a conrete operational stage of thinking will instead fall into the three groupings of pre-operational, heterogeneous and concrete operational thinking when given Piagetian tasks; (2) the heterogeneous children will include a group who show a different order of succession of achievement of the tasks than Piaget described for normal children, and (3) there will be a group of heterogeneous children who will do poorer on one-to-one correspondence and conservation of matter than the other tasks. The rest of the hypotheses dealt with the relationship between cognitive development and primary process thinking. (4) The achievement of class inclusion was predicted to be associated with increased defense effectiveness on the Rorschach because the language factor in class inclusion was thought to signify a high level of socialization. Hypotheses V through VII dealt with the premise that the higher the level of differentiation of the child as manifested in the type of thought disorder on the Rorschach the higher the level of cognitive development. (5) Contamination will be associated with preoperational children. (6) The heterogeneous children will be more likely to manifest

confabulations than contaminations. (7) The heterogeneous children who have not achieved one-to-one correspondence will be more likely to show fabulized combinations than the children who have achieved one-to-one correspondence. The last three hypotheses dealt with the relationship between cognitive development and reality-testing. (8) The preoperational children will show consistently poor external reality-testing as measured by the form level on the Rorschach as compared to the heterogeneous and concrete operational children. (9) The heterogeneous children who have achieved one-to-one correspondence will show better form level on the Rorschach than those who have not achieved one-to-one correspondence. (10) Those heterogeneous children who have achieved one-to-one correspondence will show better form level on the Rorschach when the response is confabulated than the heterogeneous children who have not achieved one-to-one correspondence.

Hypotheses I and II which reduplicated previous studies on the cognitive organization of "schizophrenic" children and Hypothesis IV which predicted the relationship between class inclusion and defense effectiveness on the Rorschach were confirmed. The level of signifi- was established at .05 using the Fisher exact test in a two-tail test.

A summary of the hypotheses that were confirmed and the additional findings whose level of significance was .05 follows. The majority of the children showed a delay in the development of the

cognitive structures and a lack of the structural closure associated with the concrete operational stage of thinking. In addition they did not show the same order of succession of the tasks as Piaget described for normal development. In particular, seriation proved to be the most difficult task. Furthermore, unlike normal children, there were frequent intrusions of egocentric material into these children's cognitive functioning which was associated with a high defense demand and poor controls (DE) on the Rorschach.

A relationship was found between the development of operatory structures and the ability to control the expression of primary process thinking (DE) as well as minimize deviations from logical thinking (formal); however, this was not paralleled by an increasing socialization of primary process thinking (Level 2). In addition, it was the operatory structures involved in one-to-one correspondence and class inclusions that proved to be critical both in overall cognitive development and in their effect on primary process thinking (DE and formal). However, the frequent exceptions to these findings point to the control and regulation of primary process thinking (DE) by operatory structures being a relationship that is particularly vulnerable to disruption in "schizophrenic" children; for example, as in the Rorschach where the emergence of fantasy material (confabulations) frequently disrupted the perceptual organization of reality (form level).

A second part of the results was a qualitative analysis of the findings which used example case studies to elucidate the statistical trends found in the quantitative analysis. One main trend explored was the three patterns of functioning that emerged from a cognitive and developmental analysis of the data. The groupings that emerged consisted of: (1) the heterogeneous children who showed a delay of structuralization; (2) heterogeneous children who showed an arrest of structuralization; and (3) a concrete operational child. In addition, examples of those heterogeneous children who had achieved one-to-one correspondence and those who had not achieved one-to-one correspondence were described and discussed in an attempt to explore the structural changes implied by the achievement of one-to-one correspondence.

Two main implications of these findings were discussed. The first point was that the level of cognitive structualization that is inferred from the achievement of one-to-one correspondence is indicative of internalization processes that result in certain overall structural changes that affect the child's affective as well as cognitive functioning. Specifically, the achievement of one-to-one correspondence was said to indicate an important step in boundary differentiation which is crucial in the increased stabilization of the differentiation between the inner world of mental representations and the external object world. This increased stabilization of differentation was

argued to be important in the child's ability to maintain external reality-testing while expressing libidinal and aggressive wishes. It was also speculated that the structuralization implied in the achievement of one-to-one correspondence shifted the expression of the disturbance from a problem of boundary differentiation to the symbolic system. In addition, the achievement of the concrete operational stage of thinking was hypothesized to be associated with a stabilization of affective, as well as cognitive functioning.

The second point was that the structural and developmental analysis of the functioning of these children gave rise to three different patterns of functioning which could be placed in three different diagnostic categories.

A last point was that there were a variety of areas for future research that would be of interest. Three of these areas were described: (1) a comparison of the cognitive and primary process development of a "schizophrenic" population with a normal population; (2) a longitudinal study of the development of cognitive and primary process thinking in "schizophrenic" children; and (3) the effects of therapy on the structural organization of "schizophrenic" children.

# Appendix A

## PROPOSAL SENT TO JEWISH CHILDCARE ASSOCIATION

# A Proposal for the Study of Childhood Psychosis: A Look at Cognitive and Ego Development and the Problem of Organization

The purpose of this study is to understand the underlying structural organization of psychotic children in the hope that this will help facilitate the treatment and education of these children. The thought processes of the psychotic child are of special relevance since this is one area -- the area of the child's relationship to reality -- that is most often disturbed. Therefore, the cognitive sphere of functioning and its relationship to the structural organization of the child has been picked as the focus of this study. Two approaches to the study of thought processes have been chosen here: a Piagetian approach and a psychoanalytic one.

The rationale for a Piagetian approach derives from the fact that Piaget's theory is a developmental theory that describes the development of structures. From this point of view, it is important to look at childhood psychosis within a developmental context because, as David Beres (1971) has pointed out, the diagnosis of childhood psychosis is made difficult by the problem of differentiating between abnormal and normal processes in childhood itself. This means that: (1) there is a much larger possibility with children than with adults that they will grow out of the pathology and (2) that what might be a sign of severe pathology in an adult may be much less severe in a child since

psychopathology of every sort in young children will "carry a larger component of ego deviation than in the older child or adult" (Beres, 1971, p. 173). Therefore, by using a Piagetian approach one can look at the thought processes of the child within a developmental context which should help in differentiating normal from abnormal processes.

Wulach (1976) showed that there is a parallel development between operational thought as defined by Piaget and the development of secondary process thinking. This brings us to our second approach which will be to use the Rorschach to look at the development of primary and secondary process thinking. There are two objectives in this approach. The first is to attempt to continue to verify Wulach's results except that in the case of childhood psychosis we are looking for similar aberrations in the development of secondary process thinking and operational thought. In general, the second objective in using the Rorschach is to be able to look at the development of the thought processes within the global context of development of the individual from the psychoanalytic concept of the ego.

## Brief Summary of a Review of the Literature on Cognitive Development in Psychotic Children.

A close look at the Piagetian studies on the cognitive organization of psychotic children allows us to become more specific on the questions surrounding the underlying organization of the psychotic child.

In general, the studies that have been done (Schmid-Kitsikis, 1973; Shackelford, 1976; McLaughlin, 1976) show that psychotic children who should have achieved concrete operational thinking if they were developing normally, fall into three groups when confronted with Piagetian tasks: preoperational, "transitional," and concrete operational. The most obvious difference from normal children is that there is a lag in the achievement of concrete operational thinking in the preoperational and "transitional" groups of children. The preoperational children basically seem to show a cognitive delay for as of yet unspecified reasons. They show homogeneity in their functioning at a cognitive level where the perceptual aspects of reality dominate. This, however, is not true for the "transitional" children. They are no longer totally dominated by the perceptual aspects of reality, yet they have also not achieved cognitive dominance. There is some evidence (Schmid-Kitsikis, 1973; McLaughlin, 1976) that at least some of these children show the most difficulty when confronted with tasks in which there are perceptual transformations. This means that they differ from normal children in the domains to which concrete operations are applied. Other studies find, however, that although the sequence of achievements differ from normal children, there is no pattern to the aberrant sequence; it differs for each child (Shackelford, 1976). One way to understand this paradoxical evidence is that there is a subgroup of children within the "transitional" group who when faced

with a situation in which perceptual stimuli dominate, either because of the nature of the stimuli or the changes it undergoes, are unable to apply the cognitive operations that they are able to apply in other situations. This would imply that although logical structures do exist there is a difficulty in their application because of their inability to block out competing stimuli, i.e., stimuli whose presence dominates over the appropriate form of cognition. One might hypothesize that this is the equivalent of what has been described extensively in the literature as the lack of more sophisticated defense mechanisms in these children that allows them to be overwhelmed by both internal and external stimuli.

Another difference in the psychotic child's functioning is in the way of responding when confronted by cognitive conflict. Schmid-Kitsikis (1973) describes the use of "conflict avoidance mechanisms" such as the attempt to change the reality in order to negate the existence of a conflict. Shackelford noticed that the children she tested when confronted by a cognitive conflict they could not solve would resort to "unusual responses" which she hypothesized under more stressful circumstances would become a thought disorder. In both studies the psychotic children differed from the normal children who use earlier cognitive justifications when confronted by cognitive conflicts they cannot resolve. These descriptions of cognition in the psychotic children parallel in many ways other descriptions of psychotic

children and their need to withdraw from reality as a defense. Shackelford's description of the children's resorting to "unusual responses" parallel in many ways Ekstein's (1956) description of the borderline children he worked with and their use of psychotic regression as a defense he worked with and their use of psychotic regression as a defense against an unbearable reality. According to Ekstein, and it would also apply to Shackelford's group, there are structural deficits that make possible this vulnerability to "regression."

The only studies that have been done on primary process development in psychotic children have been done on adolescents (Silverman, 1962; Greenberg, 1971). Basically, the few findings have been that there is: (1) a high amount of primary process thinking in these children, and (2) there is a positive correlation between primary process domination in thinking and unneutralized aggression.

Areas and Questions to be Explored

I. A description of the cognitive organization of children diagnosed as psychotic, i.e., what stage they are in and what are the processes of cognitive functioning. One area of interest is to look at those children who are "transitional"

and the sequence of domains that they have achieved concrete operations in. If there are aberrant sequences is there a pattern to them or not?

II. One area that should give some information on the manifestation of a thought disorder in these children is to look at the relationship between the cognitive stage of development and the manifestation of primary process thinking. Are children at certain stages of cognitive development more vulnerable to manifestations of a thought disorder?

III. Another related area is the use of primary process thinking and its relationship to cognitive development. Is a child more likely to use regression to primary process thinking as a defense if he's developed to a certain cognitive stage or is this not an important variable?

## Method

In order to explore these questions it will be necessary to have at least ten children who have been independently diagnosed as psychotic or borderline psychotic and who should have reached a concrete

operational level of thinking (8 to 10 years). They will each be given a battery of Piagetian tasks and the Rorschach. It should take from three to four one-hour sessions for each child. The Rorschach will be administered and scored according to Holt's method of scoring for primary process thinking. It will also be analyzed for the context within which the formal aspects of primary process thinking will occur. Each child's Rorschach protocol will then be examined for a consistent pattern in the use and appearance of primary process thinking. These patterns will be compared to the level of cognitive development that the child has achieved. The child's cognitive organization and his method of dealing with cognitive conflicts will be analyzed through the Piagetian tasks.

## Feedback

It is hoped that feedback from my results can be of use to the people who work at Childville, both in terms of the results from individual children and in terms of the results from all the children and their meaning in terms of the structural development of these children and their thought processes.

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# Appendix B

# PROCEDURE

# PROCEDURE

E: "I'm going to show you some things today and ask you some questions.

If child asks why I am doing this, E: "I am trying to learn about children your age. I hope that some of what I learn can be used to help you and other children at _____ (the institute)."

Show s the tape recorder. E: "Have you ever seen one of these before? Would you like to see how it works? Say something and then we can listen to it."

If s can't think of anything to say, have him or her say their name.

## I. Reality-orientation questions

E: "Before I show you some things I have here I'd like to ask you some questions."

## II. Piagetian tasks

E: "I'm going to show you some things and ask you some questions about them."

(1) Class inclusion

(2) Conservation of matter

(3) One-to-one correspondence

(4) Seriation

(5) Dichotomy

III. Rorschach

Materials:

(1) 10 Rorschach cards face downward

(2) A location chart

(3) Ruled paper for recording responses of s

(4) Stopwatch

(5) Tape recorder and tape

"Today I'm going to show you some inkblots. You might have seen them before. Did you ever see ink spill on paper? It makes a big spot on the paper -- an inkblot -- and sometimes when you look at a blot, it looks like something. Different people often see different things.

Now look at these inkblots and tell what you find in them, what they might be.

Card I. Hand it to the s. If no response after 20 seconds:

E: What does it look like?" or "Can you tell me about it?"

If s says, "I don't know" or "Can't see anything," etc.:

E: "You know, different children often see different things. What do you see in them?"

If s gives one response and stops: E: "Some children see more than one thing in the cards. If you do, just tell me." All ss are encouraged to give more than one response to Card I and to look at

it for at least one minute.

E: "Fine, when you've seen all the things you can see in the blot, put it down here." (E takes card and places it face down.) "And we'll do the next one."

Special problems:

If s doesn't give any response on subsequent cards, E encourages the child as in Card I. If s still finds nothing, E says: "That was a hard one. Let's try this one (next card)." No special prodding if s only gives one response on subsequent cards to Card I. Stop s after eight responses.

General administration:

Allow s to go through 10 cards with as little interference as possible.

Record: response, reaction time, total response time, position of card: $\wedge$ = apex, i.e. top of card. $\mathcal{O}$ = total turn around.

Three parts to Rorschach: (1) initial response, (2) inquiry, and (3) testing limits.

Inquiry:

Clarify every unclear noun and adjective. Hand s the cards.

Five types of inquiry: (1) location, (2) determinant, (3) content, (4) affect, and (5) unrealistic aspects.

Location: E: "Where on the card did you see that? Show me."

If unclear can have the child outline it.

Determinants: E: "What made it look like a _____?"

To get further clarification on:

Form: "Can you describe the _____ to me?"

"Tell me a little more about it."

"Where is the _____? (parts of it to help visualize)"

Movement: "Is it, are they--in a particular position?"

"Does it look alive?" If yes, "What makes it look alive?"

Color: "What about this part made you think of _____?"

"What it just the shape that made you think of it?"

Shading: "Was it just the shape that made you think of _____?"

"Was it made of any material?"

Affect: "Is it nice, not so nice, doesn't matter?"

"What makes you like it, scary, etc.?"

Unrealistic aspects: For possible contaminations, confabulations, fabulized combinations:

"You said this was a _____"

"Could you tell me a little more about that?"

For a fabulized combination:

"Do they go together?"

Testing the limits:

Spread out all 10 cards. Test limits on determinants the s has not used, plus ones not sure if s used or not.

E: "Often times people see _____. Can you see _____?"

M: E: Often times people see people or animals doing something."

C: E: "Often times people see a color that makes them think of something."

FC: "Sometimes people see things that have both a color and a shape that makes them think of something." "Would it be the same without the color?" "Find something where it wouldn't be the same without the color."

Fc: "Sometimes people see things that make them think of something fuzzy." "Sometimes people see something that makes them think of some kind of material."

# Appendix C

## REALITY-ORIENTATION QUESTIONNAIRE

# REALITY-ORIENTATION QUESTIONNAIRE

Name:

Date:

(1) What's your name? Last name?

(2) How old are you?

(3) When is your birthday (month and date)?

(4) What year were you born?

(5) Where are we now?

(6) Do you know what day it is today?

(7) What day will it be a week from now?

(8) What day was it a week ago?

(9) What month is it?

(10) What year is it?

(11) Summer will be here soon. What are you going to do then?

(12) What do you like to do best?

(13) What do you like to do least?

# Appendix D

## CRITERIA FOR EGOCENTRIC INTRUSIONS

# CRITERIA FOR EGOCENTRIC INTRUSIONS

Egocentric intrusions: an expression of an (1) inner dynamic which is (2) made overt (3) in relationship to the cognitive task either through a (4) fantasy or defense, verbal or nonverbal.

Rating of egocentric intrusions. The highest rating is scored.

(1) occurs

(2) occurs frequently (more than once)

(3) task is assimilated to the egocentric intrusion, i.e., either the materials or verbalizations become dominated by the inner "theme."

(4) interferes with the successful completion of the task

# Appendix E

## SUBJECT DESCRIPTION – DEMOGRAPHIC VARIABLES

## SUBJECT DESCRIPTIONS - DEMOGRAPHIC VARIABLES

**(Subjects who Received both the Rorschach and Piagetian Tasks)**

| Subject | Sex | Age | FS IQ | V IQ | P IQ | First reported sign of disturbance | Developmental milestones |
|---|---|---|---|---|---|---|---|
| P | M | 12-0 | 113 | 109 | 115 | 3 yrs. suicidal and homocidal behavior | normal |
| V | F | 12-6 | 93 | 91 | 98 | 7 yrs. hospitalized. threatened mother with a knife. | N.R.* |
| E | M | 12-6 | 95 | 81 | 112 | 8 yrs. | Speech delay: 6 yrs still had "garbled" speech. |
| PT | F | 11-5 | 74 | 64 | 90 | Infancy: tantrums. would hold breath till blue. | Speech delay: didn't talk till 4 yrs. |
| S | M | 11-5 | 87 | 87 | 90 | 4 yrs. delayed speech, toilet training, feeding, kept in crib till 4 years by paranoid schiz. mother. | |
| VN | M | 8-6 | 110 | 110 | 108 | 6 yrs. overactive and destructive behavior. | N.R. |

(Subjects who Received both the Rorschach and Piagetian Tasks), cont'd

| Subject | Sex | Age | FS IQ | V IQ | P IQ | First reported sign of disturbance | Developmental milestones |
|---|---|---|---|---|---|---|---|
| J | M | 10-3 | 94 | 85 | 106 | 6 yrs. problems adjusting to foster family. | N.R. |
| G | F | 10-2 | 80 | 86 | 76 | 7 yrs. locking and smelling of walls | Normal |
| D | M | 10-8 | 84 | 88 | 82 | 2 yrs. on: "different" after 106 fever. | Trouble toilet training |
| A | F | 12-5 | 84 | 79 | 92 | 15 mos. stopped talking. | Didn't start to talk again until 6 yrs. |
| M | F | 10-5 | 88 | 82 | 96 | 7 yrs. behavior disorder | Normal |

*N.R. = Not Recorded

(Subjects who did not Receive the Rorschach)

| Subject | Sex | Age | FS IQ | V IQ | P IQ | First reported sign of disturbance | Developmental milestones |
|---|---|---|---|---|---|---|---|
| TM | M | 12-0 | 83 | 79 | 92 | 15 mos. seemed withdrawn, separation anxiety. | Normal |
| T | F | 8-7 | 98 | 98 | 98 | 4 yrs. marked behavior problems | Sick as infant, asthma |
| L | M | 9-4 | 70 | 74 | 69 | 17 mos. stopped talking | Sensitive skin |

DEMOGRAPHIC VARIABLES, cont'd
(Subjects who Received both the Rorschach and Piagetian Tasks)

| Subject | Earliest Diagnosis | Present Diagnosis | Hallucinations | Mother's Pregnancy | Birth |
|---|---|---|---|---|---|
| P | Childhood schiz. | Schizophrenic reaction | possibility | normal | transverse birth |
| V | Psychotic thinking, delusions | Schiz. with paranoid features | None reported | normal | normal |
| E | Autistic orientation | Ego deviant | None reported | N.R. | N.R. |
| PT | Childhood schiz., autistic type | Borderline schiz. with organic features | None reported | normal | incubator baby |
| S | Childhood schiz. | Depression of childhood (schiz. process) | None reported | N.R. | N.R. |
| VN | Behavior disorder | Impulse disorder (schiz. process) | None reported | normal | normal |
| J | | Chronic depression (schiz. process) | None reported | N.R. | N.R. |
| G | | Childhood schiz. | None reported | normal | Caesarean |
| D | Childhood schiz. | Childhood schiz. | possibility | normal | induced labor |
| A | Childhood schiz. autistic type | Childhood schiz. | Auditory & visual | N.R. | N.R. |
| M | Behavior disorder | Chronic depression (schiz. process) | None reported | N.R. | Premature, breech birth |

DEMOGRAPHIC VARIABLES, cont'd
(Subjects who did not Receive
the Rorschach)

| Subject | Earliest Diagnosis | Present Diagnosis | Hallucinations | Mother's Pregnancy | Birth |
|---|---|---|---|---|---|
| TM | Childhood schiz. | Chronic depression (schiz. process) | None reported | normal | Anoxia |
| T | Adjustment reaction | Depressive reaction (schiz. process | None reported | normal | normal |
| L | Childhood schiz. | Schizophrenic reaction, childhood type | None reported | normal | normal |

# Appendix F

## REMAINING CASE STUDIES OF THE CHILDREN WHO RECEIVED BOTH THE RORSCHACH AND PIAGETIAN TASKS

# REMAINING CASE STUDIES OF THE CHILDREN WHO RECEIVED BOTH THE RORSCHACH AND PIAGETIAN TASKS

M: a non 1-1 heterogeneous child.

M was a ten year old girl who had been placed in the residence one and a half years ago with the diagnosis of "ego deviant." She had been a premature baby. At three months of age she was found abandoned in the street. She became a foster child, but her foster family was physically abusive. Her developmental milestones were reported to be normal.

When I saw her she was a small wisp of a girl, rather pretty, who spoke very softly. On the cognitive tasks the whole process of questioning her answers seemed to be very disturbing to her. She appeared dejected and at times hostile. Her voice would get softer and softer so that I could hardly hear her. On the Rorschach she ended by whispering her responses.

Cognitively, M's average of 1.70 was the lowest on the cognitive continuum of the eleven children tested. Like G, she had achieved stage 2 on one-to-one and dichotomy was the only task in which she was concrete operational. She was stage 2 on one-to-one because she tended to fluctuate with the counter-suggestions. In addition, she was only able to achieve stage 1 on conservation of matter and class inclusion, and stage 1b in seriation. She was even more perceptually bound

than G and unable to block out external stimuli. For instance, in class inclusion she could only name animals that were present in the room. I had taken out the bears and donkeys before questioning her. When I asked her to name some animals she responded, "Bears, donkeys." I asked for some others and she began to give me the subset of bears, "Polar bears, panda bears." She added snakes, but then pointed to a picture on the wall that had a snake in it. She was finally able to add "bunny." She also showed, similar to G, the simultaneous functioning of earlier cognitive structure when she grouped the objects in dichotomy to form a graphic collection of a "complex object." After having spontaneously grouped the objects according to color and shape, she put a small circle above a big circle and said, "It's chubby, a chubby man." After I had repeated the directions she classified the materials according to size.

She showed more egocentric intrusions than G. There were both nonverbal and verbal assimilation of the materials to some inner theme, but they remained relatively isolated from the cognitive functioning. However, much of her mumbling and hostile behavior pointed to some intrusion of her inner world into the testing relationship. I seemed to be perceived as an "attacker."

This theme was prevalent throughout the Rorschach material where her frequent precepts of things that "sting" pointed to her experiencing the world as an antagonistic environment. M differed

from G in that she showed a high amount of primary process material; in fact, she had the highest Pripro density of all the children. The inadequacy of her defenses, as measured by her ability to maintain an acceptable measure of perceptual organization (form level), and the high defense demand resulting from a high amount of oral-aggressive content and formal deviations resulted in a low defense effectiveness. Like G the primary process material manifested in the Rorschach was still similar or below what Wulach described as average for this age (1976). And also like G, some of her most severe disturbance was in the boundary disturbance manifested on the Rorschach through behavior that was not scorable. This was evidenced in her touching and responding to the precepts as if they were real.

VN: a 1-1 heterogeneous child

VN was another one of the cognitively lower functioning heterogeneous children whose functioning was congruent with the statistical relationships found between the primary process variables and cognitive variables. Although out of the fourteen children there were two eight year olds and one nine year old who were included in the findings of those cognitive variables related to age, VN was the only eight year old (8-6) who was also given the Rorschach. The next oldest child of the eleven who were given the Rorschach was G, who was 10-2. Therefore, VN is the only example I have of one of the younger children.

VN had been institutionalized two years ago because of uncontrollable, destructive behavior. He had been diagnosed as an "Adjustment Reaction of Childhood -- Impulse Disorder," but the psychological had emphasized an underlying schizophrenic process. He was a bright child with a Full Scale I.Q. of 110, a Verbal I.Q. of 110 and a Performance I.Q. of 108.

He was a highly anxious, black boy with a large smile and a total inability to keep from moving around and handling things. There was a rather charming, funny quality to him even when he was being difficult. He sang and chanted his way through most of the Piagetian tasks.

Like D, VN was at a concrete operational level on one-to-one correspondence although he was at the lower end of the cognitive continuum with an average of 2.13. In addition, he was concrete operational on conservation of matter and class inclusion although there was evidence of the simultaneous existence of preoperational structures which was manifested in his loose, associationistic responses. For instance, on class inclusion when asked, "If I give you all the bears, what remains in my bunch?" he responded in a rapid-stacatto voice, "Bears, oh, the zebras! Oh, I mean nothing."

One of his vulnerable areas was seriation in which his inability or unwillingness to conceptualize what I was asking of him made him achieve stage 1a. He would pile the sticks on top of each other, then

begin to lay them out flat, then on realizing it wasn't correct start piling them up again, then place them "like a train that gets on line." The difficulty of this task for him: "It's too hard," intensified his anxiety and I had a difficult time keeping him in the room. He also only achieved the two spontaneous classifications of shape and size on dichotomy. There was also evidence of the simultaneous existence of earlier classification tendencies such as his not including all the objects in the classification. I had to constantly focus and structure him so that he would function up to the cognitive level he was capable of. It was interesting that one of the earliest ways of classifying, with color, was the form he left out. He was able to verbalize or sing this classification: "Oh, the red goes with the red and the blues go with the blues," but would not put them together. As with seriation it was hard to tell how much his way of coping with anxiety through oppositional behavior lowered his cognitive functioning.

VN's cognitive functioning was full of egocentric intrusions which did not appear to effect his cognitive functioning as much as his manner of coping with anxiety through oppositional behavior. Most frequently they were the assimilation of the materials to some inner fantasy: "Square, square, the family . . . and the circles are the girls and the squares are the boys." Similar to D, it was the thought process itself manifested in language that would often become assimilated to the inner world, a world where differentiation

was still a problem. For example, when asked which child would have the greater bunch, he responded: "The child that was the bears." Also similar to D, there was a rather loose, associationistic quality to his responses: "How many bears are there?" "1, 2, buckle my shoe."

As was congruent with the statistical findings, VN showed a high percentage of formal deviations; in fact, he was the only child who showed a higher percentage of formal deviations than content. An example was his fabulized combination of "puppet-rabbit-angels" (Card VII). He also showed rather good defense effectiveness and low primary process density that was congruent with his concrete operational thinking on one-to-one correspondence and class inclusion. His adequate to excellent ability to have clear, well-articulated precepts when under pressure from primary process material was responsible for his high score. This as well as a high defense demand resulted in a higher score on adaptive regression than would be expected for a child on the lower end of the cognitive continuum.

VN was also an exception to the finding that the higher the sum of egocentric intrusions the lower the defense effectiveness. His high sum of egocentric intrusions and the relatively high defense effectiveness coupled with an appropriately high defense demand points to the press of inner material being dealt with in some other way. One possibility is that VN's constant motion enabled him to

express things motorically rather than in the verbal or cognitive spheres. One difficulty with Holt's method of scoring the Rorschach is that it is inadequate for capturing the defensive functioning of children who tend to express things motorically.

S: another 1-1 heterogeneous child.

S was another child who tended to express things motorically. He was a cognitively heterogeneous child who was on the high end of the cognitive continuum and his functioning was congruent with the statistical relationships described for his cognitive level and most of the primary process variables.

He was an eleven year old boy who had been institutionalized five years earlier. He had been raised by a mother who had been diagnosed as schizophrenic. She had kept him in a crib until he was four years old. At this age he was unable to feed himself, walk properly, and showed a delay in the development of speech. Upon being institutionalized he was diagnosed as a "childhood schizophrenic."

S was a toussled-haired, good looking boy who appeared the first session with a half disgruntled, half mischievous expression on his face. He was using crutches having recently broken his leg. Of all the children I tested he was the most difficult because of his intensely oppositional behavior. If I told him not to do something he would do it; as soon as I would say he could do it he lost interest and

turned to some other forbidden area of action.

S fell in the higher end of the cognitive continuum with an average of 2.67. Like VN he was at a concrete operational level in one-to-one correspondence, conservation of matter and class inclusion. His achievement in these areas was more stable since, unlike Vincent, there was no sign of simultaneously functioning preoperational levels of thought. He was only atypical in the intensity of his oppositional behavior and the intense feelings of low self=esteem that he manifested.

His vulnerable areas were also similar to VN's. He achieved stage 2 in seriation because although he showed the ability to anticipate the whole figure and to organize accordingly, he reverted to a trial-and-error approach when handed the left-out-stick to fit into the stair-case. In addition, he only achieved stage 2 in dichotomy because of the reclassifying of the material according to an idiosyncratic classification. After having spontaneously classified the materials for size and color, S's third classification became one of "opposites," a theme that had dominated his behavior. Group II contained the opposite elements in terms of size and color of group I. If group I had a big blue square, group II had a small red square. If I placed the big blue square in group II it couldn't go because group I "would only have one square." There was the ability to shift the classification schema but what dominated was an idiosyncratic rather than socialized schema.

S's functioning on the Rorschach was similar to the other children in this population who were at his cognitive level. However, as in his cognitive functioning, there was evidence on the Rorschach of the infusion of his own idiosyncratic, possibly delusional, thinking. He kept insisting that some inkblots were drawn by artists while others were by "regular people" and that he could see the difference.

With S it seemed to be that the process of classification itself became assimilated to an inner theme that also dominated much of his behavior and that one might hypothesize played an important defensive function. This is not just the assimilation of the materials to an egocentric intrusion as with some of the other children discussed, but similar to D and VN, it is the assimilation of the thought process itself. With D, the thought is assimilated to the preoccupations themselves, with VN and S, in different ways, the thought begins to take on a defensive function.

PT and E: two 1-1 heterogeneous children who showed disturbances in the development of speech

PT: PT was an eleven year old girl who had first been institutionalized two years ago with the diagnosis of "borderline schizophrenic." Although her mother's pregnancy had been normal, she was an incubator baby. She also was a difficult baby from the start with frequent temper tantrums. She did not begin to talk until she was four years of age, and only developed sentences by the time she was six years of age.

When I saw her she was a tall, lanky girl who tended to droop herself over the nearest object in a rather passive and formless way. The day that I gave her the Rorschach she was totally affectless. According to her teacher PT was upset that day because a person who worked with her was absent.

PT achieved at a concrete operational level in all the cognitive tasks except dichotomy. A problem that appeared in seriation as well as dichotomy was what could be described as a short-circuiting of her ability to comprehend the question being asked. In seriation she had been answering all the question appropriately, but was totally thrown when asked to build the staircase behind the screen. She seemed all of a sudden to become completely disorganized and unable to comprehend the task: "What do you mean?" she responded. Previously, she had had no problem with understanding what she was to do. With an equally abrupt shift she all of a sudden understood, "I know what do," and finished the task appropriate. In dichotomy, it was also as if there were a short-circuiting of her ability to comprehend the problem. In this case, after having spontaneously arranged the materials into the two different groups of size and color, she suddenly could not understand what I meant by asking her to arrange the materials into <u>two</u> groups. In addition, she had difficulty in retaining the conceptual category of the group and would focus on the perceptual aspects when I would make a counter-suggestion by placing one

member of a group on another member of a group and asking her if it belonged. She would answer according to the perceptual discrepancy between the two pieces right then, rather than the conceptual categorization she had previously achieved. If I placed the piece near the other group's members but not on it she would be able to answer correctly, retaining the same categorization of the materials.

PT showed a low number of egocentric intrusions in her cognitive functioning. On class inclusion and conservation of matter she would frequently assimilate the materials into some fantasy of her own. The mode of this assimilation was frequently nonverbal such as her making a circle of bears around the donkeys, or making the clay into an ashtray. The intrusions did not interfere with her cognitive functioning.

Congruent with her cognitive level, PT showed a low amount of primary process material on the Rorschach which resulted in a low defense demand. In addition, her good form level resulted in a high defense effectiveness. What primary process content there was was presented in a well-socialized and acceptable way. It was in one of the two formal deviations that the severest distortion of perception occurred when a level 1 fabulized combination (C-Co 1) appeared of a butterly with feathers seen in a white space on Card II. But this was only one break in a basically (innocuous) protocol.

One last note. PT's history of being an incubator baby, as well as the "short-circuiting" quality to her cognitive functioning raise the possibility of a large organic component to her functioning.

E: E was a twelve year old boy who had been institutionalized four years ago. He had been diagnosed as having an "autistic orientation and withdrawal" as a result of a massive symbiotic tie from his mother who had been diagnosed as schizophrenic. There was no record of the nature of his mother's pregnancy or his birth. Similar to PT, there had been a delay in the development of his speech; by the time he was six it was still garbled.

When I saw him he was a quiet boy, who had seemed very shy and ill at ease. He was the only child I tested who did not seem to enjoy the one-to-one relationship with the examiner that the testing situation offered. He would sit, avoiding my eyes while combing his long and rather greasy brown hair.

E achieved at a concrete operational level in all the tasks except seriation in which he used a trial and error approach, although by the end he was beginning to be able to anticipate and therefore organize the sticks more appropriately. In addition, he found it difficult at times to retain the original question. His focus could be shifted by a counter-suggestion and it would take him a second to be able to regrasp the original question. This created a slighlty hesitant tone to many of his answers even though they were correct. This seemed

similar to PT's problem of retention and the way a shift in the external stimulus could cause a temporary disorganization of the ability to apply cognitive operations.

E showed fewer egocentric intrusions than PT. As with PT, they did not interfere with his cognitive functioning. Both of his intrusions were an assimilation of the materials to some idiosyncratic fantasy. One was the assimilation of a bear to a schema of aggression, while the other was a more neutral assimilation of a plastic square to a functional schema of a backgammon piece.

On the Rorschach E showed good defense effectiveness due to the predomination of popular form responses, and a very low quantity of primary process thinking. He was the only child to show no level 1 primary process thinking. Most of the primary process content was on a well-socialized, acceptable level. The only formal deviation that existed was one verbal slip. There was, however, one disruption of his defenses in which he showed a loss of distance. On Card IV he saw "a monster" with "big feet, like gorilla feet. . . and he's all made out of hair so you can't see his eyes and nose." It was "scary. . . because he's bigger than me."

One might describe this, as well as his difficulties on the Piagetian task, as difficulty in maintaining a stable mental representation. In both, an external stimulus, in the Piagetian tasks a question, in the Rorschach a precept assimilated to an affective schema, are disruptive

of the cognitive functioning.

Both PT and E had difficulty in maintaining a stable mental representation which resulted in a temporary disruption of cognitive functioning. However, this disruption is kept to a minimum by what appears to be good defensive functioning. In E's case the disruption seemed to result from a boundary problem -- a receptivity to external stimuli -- that he usually keeps at bay through an inhibition of his affective life and other defensive functioning. In PT's case there seems to be a larger organic component.

# Appendix G

## ADDITIONAL TABLES

Table 6

Probability Levels Using Fisher Exact Test
for Demographic Variables

| | Age | Disturbed Language Development | Onset |
|---|---|---|---|
| Sum Piaget | $p < .025$ | $p < .05$ | - |
| Minimum Piaget | $p < .005$ | $p < .025$ | |
| Seriation | $p < .025$ | - | |
| Adapt. Regr. | $p < .05$ | - | - |
| Pripro Con/For. | $p < .025$ | - | - |
| Verbal T.D. | $p < .025$ | - | - |
| Formal | - | $p < .025$ | - |
| Defense Deman. | - | $p < .025$ | - |
| Fab. Combin. | - | - | $p < .05$ |
| I.Q. | - | - | $p < .005$ |

Table 7

Reality-Orientation Scores

| Subject | Percentage Correct |
|---|---|
| P | 100 |
| V | 90 |
| E | 80 |
| PT | 50 |
| S | 90 |
| VN | 60 |
| J | 80 |
| G | 70 |
| D | 60 |
| A | 100 |
| M | 90 |
| TM | 90 |
| T | 70 |
| L | 70 |

Table 8

Egocentric Intrusion Scores

| Subject | Class inclusion | Conservation of matter | 1-1 correspon. | Seriation | Dichotomy | Sum | Severity |
|---|---|---|---|---|---|---|---|
| P | 1 | 4 | | | | 5 | 4 |
| V | 2 | 2 | 2 | | | 6 | 2 |
| E | 1 | | 1 | | | 2 | 1 |
| PT | 1 | 1 | | | | 2 | 1 |
| S | 1 | | | | | 1 | 1 |
| VN | 2 | 1 | 1 | 1 | 2 | 7 | 2 |
| J | | | | | 4 | 4 | 4 |
| G | 1 | | | | 3 | 4 | 3 |
| D | 3 | 1 | | | | 4 | 3 |
| A | | | | | | 0 | 0 |
| M | 1 | 1 | | | 2 | 4 | 3 |
| Sum | 13 | 10 | 4 | 1 | 11 | | |

Table 9

Summation Scores for
Each Child on the Rorschach

| | R | Mean Form Level | Mean Creativity | Mean Defense Effectiveness | Mean Defense Demand | Mean Adaptive Regression |
|---|---|---|---|---|---|---|
| P | 24 | 5.33 | 1.79 | 1.07 | 2.30 | 2.53 |
| V | 22 | 4.55 | 1.95 | .53 | 2.47 | 1.66 |
| E | 15 | 5.40 | 1.66 | 1.12 | 1.37 | 1.62 |
| PT | 20 | 5.10 | 1.65 | 1.10 | 1.80 | 1.60 |
| S | 15 | 4.40 | 1.53 | 1.08 | 2.17 | 2.00 |
| VN | 20 | 4.95 | 1.70 | 1.10 | 2.20 | 2.70 |
| J | 23 | 5.17 | 1.83 | .83 | 1.83 | 1.45 |
| G | 17 | 4.76 | 1.76 | .50 | 2.20 | 1.30 |
| D | 21 | 4.05 | 2.05 | .27 | 2.94 | .58 |
| A | 19 | 5.11 | 1.68 | 1.05 | 2.00 | 1.90 |
| M | 21 | 4.57 | 1.71 | .83 | 2.44 | 1.05 |
| Mean | | 4.85 | | .86 | 2.16 | 1.67 |

Rorschach summation scores, cont'd

| Subject | No. of Pripro responses | Density | Pripro Level 1 % | Pripro Level 2 % | Pripro Level 1 & 2 % | Content Level 1 & 2 % | Formal Level 1 & 2 % |
|---|---|---|---|---|---|---|---|
| P | 13 | 1.15 | 12 | 42 | 42 | 42 | 19 |
| V | 15 | 1.50 | 27 | 59 | 61 | 57 | 16 |
| E | 8 | .87 | 0 | 37 | 37 | 33 | 6 |
| PT | 5 | .90 | 5 | 17 | 22 | 12 | 10 |
| S | 6 | 1.17 | 7 | 33 | 33 | 27 | 13 |
| VN | 5 | 1.10 | 7 | 20 | 25 | 10 | 15 |
| J | 12 | .96 | 7 | 43 | 48 | 43 | 7 |
| G | 5 | 1.40 | 0 | 29 | 29 | 23 | 18 |
| D | 18 | 1.72 | 43 | 71 | 81 | 62 | 57 |
| A | 10 | 1.45 | 16 | 50 | 55 | 45 | 16 |
| M | 9 | 1.77 | 17 | 38 | 43 | 43 | 21 |
| Mean | | | 13 | | 43 | 36 | 18 |

Table 10

Comparison of Means between Normal Children's Primary Process and Schizophrenic Children's Primary Process

| | Wulach normal transi-tional | Wulach normal oper-ational | Safrin normal latency | Matalon normal 10 year olds | Oram schizo-phrenic |
|---|---|---|---|---|---|
| Mean Age | 6.95 | 8.10 | 8.85 | 10.0 | 11.18 |
| Mean Form Level | 4.51 | 4.91 | - | 4.80 | 4.85 |
| Mean Defense Effectiveness | .59 | 1.05 | .71 | .74 | .86 |
| Mean Defense Demand | 2.19 | 2.35 | - | 2.03 | 2.16 |
| Mean Adaptive Regression | 1.31 | 1.88 | - | 1.39 | 1.67 |
| Mean Pripro Level 1 | 19.4 | 25.2 | - | 7.6 | 13.00 |
| Mean Pripro Levels 1 & 2 | 48.9 | 50.00 | 46.3 | 45.4 | 43.00 |
| Mean Content Level | 33.8 | 37.3 | 30.3 | 36.7 | 36.00 |
| Mean Formal Level | 25.5 | 27.8 | 26.7 | 16.5 | 18.00 |

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