

A STUDY IN PSYCHOLOGICAL ECOLOGY:  
STRUCTURAL PROPERTIES OF CHILDREN'S BEHAVIOR  
BASED ON SIXTEEN DAY-LONG SPECIMEN RECORDS

by

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## CHAPTER I

### INTRODUCTION

#### Psychological Ecology and Psychology

This is a study in psychological ecology. Basic concepts and methods used in the study have been introduced and developed by Roger G. Barker and Herbert F. Wright at the University of Kansas. This introductory chapter about psychological ecology and methods of the present research is abstracted from a series of publications by these authors and their associates of the Midwest Social Psychology Field Station (3, 4, 5, 6, 7, 8, 19, 20, 21, 22).

The term ecology comes from a Greek word meaning home or homeland. In the biological sciences, ecology refers to the study of the relations between the homelands or habitats of plants and animals and their functions, structures, and population characteristics. The work of the Midwest Social Psychology Field Station is a psychological analogue of this conception of ecology. It is concerned with the psychological habitats of Midwest children and with the structure, dynamics, and content of their behavior in these habitats.

Psychology has been predominantly an experimental science. The first psychologists were experimenters who worked in laboratories. The descriptive, natural history, ecological phase of science, so strongly represented in the biological sciences, in sociology, in anthropology, in the earth sciences, and in astronomy has had virtually no counterpart in psychology. This has left a serious gap in psychological knowledge. We know how people behave under the conditions of experiments and clinical procedures, but we know little about the distribution of these conditions outside of laboratories and clinics.

It is different in other sciences. Geologists, biologists, chemists, and physicists know in considerable detail about the distribution in nature of the materials and processes with which they deal. Chemists know something about the laws governing the interaction of oxygen and hydrogen, and they also know how these elements are distributed in nature. Entomologists know the biological vectors of malaria, and they also know about the occurrence of these vectors over the earth. Sociologists and cultural anthropologists have learned a great deal about the distribution of their variables in nature. But psychologists know little more than laymen about the frequency and degree of occurrence of their basic phenomena in the lives of men--of deprivation, of hostility, of freedom, of friendliness, of social pressure, of rewards and punishments. Although we have daily records of the behavior of volcanoes, of the tides, of sun spots, and of rats and monkeys, there have been few scientific records of how a human mother cared for her young, how a particular teacher behaved in the classroom and how the children responded, what a family actually did and said during a mealtime, or how any boy lived his life from the time he awoke in the morning until he went to sleep at night. Because we lack such records, we can only speculate on many important questions:

What changes have occurred over the generations in the way children are reared and in the way they behave?

How does life differ for children in large and small families?

How frequently is success achieved in everyday life and what are its consequences for subsequent behavior?

How, in psychological terms, does life differ for rural, town, and urban families?

Are American children disciplined differently from English and French children? If so, does this affect the national character of Americans, Englishmen, and Frenchmen?

Before we can answer these kinds of questions about behavior and the development of personality and character, we must know more than the experimentally established laws of behavior. We must know how the relevant psychological conditions are distributed among men.

Moreover, the lack of field data limits the discovery of some of the laws of behavior. It is often impossible to create in the laboratory the frequency, the duration, the scope, the complexity, and the magnitude of some conditions that it is important to investigate. In this, psychology has much in common with meteorology. Some of the principles of the whirlwind and the thunderbolt can be studied in the laboratory, but to extend the curves into the high values, and to include all complicating factors, it is necessary to go out to the western plains. In principle, the same is true in psychology for studies of conditions which are frequent in daily life but which are difficult to create experimentally. This should not be discouraging. Experiments in nature are occurring every day. Psychologists need only the techniques and facilities to take advantage of them. Public health scientists have long used naturally occurring differences in sanitation, population characteristics, and nutrition to test hypotheses regarding the etiology of health and disease. Astronomers, agronomists, geologists, paleontologists, and anthropologists regularly test basic scientific theories in naturally occurring situations. From a consideration of the great theoretical advances made by these so-called descriptive sciences, it would appear reasonable to hope that similar advances can be made in psychology by field studies. In leaving out ecological methods, psychology has almost completely omitted a basic scientific procedure that

is essential if some fundamental problems of human behavior are to be solved.

The Midwest Field Station was established with the hope that a station for making ecological studies of human behavior and its natural, psychological habitat would contribute similarly to the solution of practical and theoretical problems of psychology.

#### Ecological Methods Basic to this Study

Of the various procedures developed and used at the Midwest Station, three are used extensively in the present investigation. These three, The Specimen Record, Episoding, and the Behavior Settings Survey are described below.

#### The Specimen Record

The specimen record is a detailed, sequential, narrative of a long segment of a child's naturally occurring behavior and situation as seen by skilled observers. It describes in concrete detail the stream of the child's behavior and psychological habitat. In its most extensive form, the specimen record covers a day's activities. Such a record is made by a team of 7 to 9 observers taking turns throughout the day. The report usually covers 300 or more typed pages. The process of collecting specimen records has been discussed in detail elsewhere (19).

#### Episoding

The process of dividing the behavior continuum represented in a specimen record into psychologically meaningful parts is a problem which has occupied an important place in the Midwest research. Since the process of episoding specimen records is the foundation upon which the

present study of behavior structure is built, this method will be considered in some detail.

Episoding is the process of dividing a specimen record of behavior into action-and-situation units called episodes. There will be presented here as means to the explication of this process (1) the primary criteria for the discrimination of episodes, (2) an illustrative, episoded excerpt from a specimen record, and (3) data relevant to the problem of the reliability of episoding.

### Primary Criteria of Episodes

The first criterion of an episode derives from a principal characteristic of molar behavior, directedness. It provides that the behavior from the beginning to the end of an episode is constant in direction. Constant direction refers to the fact that all parts of the action in an episode appear to carry the person toward a particular behavioral end. An episode of behavior is seen by observers to be aimed at, directed toward, or converging upon a special behavioral resultant. This criterion means that for every change in the direction of behavior a change in episode occurs. Muenzinger (17) has made direction constancy the most essential feature of a start-end unit, which has other features in common with an episode. The directional characteristic of behavior has been noted by many writers. Several marks of directedness as a property of behavior are listed below, each with a psychologist who has advocated it.

1. Action persists in the absence of instigating conditions (McDougall: 16).
2. Change in position toward a part of the environment is renewed after forced digression or delay (McDougall: 16).
3. "Preparatory adjustments" appropriate to imminent situational change, toward which the observed action contributes, accompany the action (McDougall: 16).

4. Sustained locomotion is abruptly discontinued after an end, provisionally identified by the observer, has been reached (McDougall: 16).
5. Action between observable beginning and end points shows continuity (Koehler: 11).
6. Action between beginning and end points follows the shortest available path (Wheeler: 18; Adams: 1).
7. Variance in behavior is concordant with variance in the position of an environmental object (Baldwin: 2).

All of these indices are available alike to observers and to analysts of molar behavior and its conditions. Although they are not necessarily used in episodizing in an intentional and systematic way, it is assumed that these and probably other equally important signs of behavioral direction are used almost inevitably, both as evidence that an action by a person is in progress and as a means of telling one action from another, in common social intercourse and similarly in dividing a specimen record. The point is that these indicators establish the empirical manageability of direction as an attribute of molar behavior units.

Notions that have been particularly useful for the determination of both constancy and change in direction are those of present position, change in position, and terminal intended position. Synonyms of terminal intended position are goal and end. The episoder continually looks ahead to diagnose the end or the position intended from the present position of the person. Once a particular end has been fixed, all behavior seen to bring the person nearer to it is considered to lie in the same direction. The observed progress can be great or small or in the limiting case it can be zero. Also, a change in position can occur when there is no observable movement in physical space. The person can move in a social sphere of

action, as when a child speaks a piece, or in an intellectual sphere, as when a child solves a mathematical problem.

The behavior theory from which the episode stems is that an action changes the position of the person on a path in a space formed by a situation; the person locomotes on this path to or toward a sought end, a new, intended position. The test, then, of whether a particular action proceeds at a given moment in the same direction as a preceding, simultaneous, or subsequent one is this: Does the action carry the person nearer to the end diagnosed for any one of the compared actions? If it does not, its direction is different and the uniqueness of the action is established. Two processes in episodizing are implied here. The first consists in diagnosing the end toward which the person is moving; and the second consists in judging whether the "movement" brings the person nearer to that end. The total process is clearly circular. The new position is determined from the behavior of the person and the direction of the behavior is determined from its relation to the new position. In reality, however, the required judgments usually are not analytical. The direction of the behavior in relation to the new position and vice versa generally are immediately apprehended; the unity of the action in an episode generally is perceived almost as immediately as the unity of a visual form or an auditory pattern.

In using the present criterion, it is important to recognize that direction is a genotypic factor in behavior which can be clothed in diverse phenotypes; there are no behavioral specifics for either constancy or change in this behavior factor. One must also recognize that direction refers to an attribute of behavior as it is for the behaving person. This means that the observation of its constancy or change must always be tentative. One continually tests such observation in daily life by question-

ing the other person or by trying out various responses which prove more or less conclusively what the other person is "driving at" or aiming to get done. A similar experimental approach must be followed in the episodizing of a record. The same tests cannot be literally applied. Yet somewhat equivalent hypothetical tests are possible. The major requirement of episodizing from the standpoint of the direction guide, however, is considered to be a mastery of the genotype and wide familiarity with its differing manifestations.

The second primary criterion of an episode concerns its size. It states that an episode falls within the normal behavior perspective of the person which means that the episode occurs within the span of attention or clear perception by the person of his own behavior-in-progress. In the ordinary course of living, episodes are among the features of behavior which people see. Neither instruments nor inferences are needed to discern them. Behavior episodes are analogous to physical objects which can be seen with the "naked eye." They are the common "things" of behavior; they correspond to the stones, chairs, and buildings of the physical world. An episode of behavior, as defined in this research, is perceived without instruments or elaborate analyzing and synthesizing behavior by both the behaving person, himself, and by those who view his behavior "from the outside." In both cases, behavior episodes are within the ordinary behavior perspective of normally sensitive persons.

The maximum behavior perspective is achieved only by special techniques, as in cases of "insight" under clinical direction. This does not mean that the normal behavior perspective is rigidly fixed. It varies instead from moment to moment, although its limits appear to be quite sharply defined. The behavior units outside this range are real and legitimate. They are

left out of direct account in episodizing, however, for the reason that, by definition, a behavior unit which falls outside the perspective by the person on his own behavior is not an episode. Considered as a device of the present method, the behavior perspective is an aperture past which the continuum of action by a person must pass and through which one can see episodes of behavior. This perceptual coordinate, in other words, is a range finder. One can use it to say how big episodes are, to identify units of the prescribed size, and to exclude those which are either larger or smaller. On the other hand, it says nothing about the essential nature of an episode. Nor should it be taken to imply that episodes have only an heuristic, perceptual significance. An episode rather is a natural unit of action and situation with an integrity which depends first upon its dynamical and structural properties.

In the practical application of this criterion, it is recognized that the behavior perspective of a person, like the direction of his behavior, is defined in terms of what exists for the person which means that, like direction, it cannot be observed directly. No observer can pretend to get into private worlds in using this or any other test for an episode. Yet certain marks of action limits are perceived no better by the person than by an observer. The observer sees from the outside what the person sees from the inside. The result is that we all are able to detect, in the continuing behavior of our associates, units that evidently match well their behavior perspectives. Even children are remarkably sensitive to the intended boundary lines between the actions of their mothers, fathers, and teachers; children of five and six years know rather well, many exceptions to the contrary notwithstanding, when to break in or hold back on occasions when adults are intermittently busy.

Persons could not hope to get on well with others without ability to discriminate their intended actions. We have to know with a good deal of precision when the things our associates do and mean to do begin and end. This ability seems as indispensable to our social relations as object discrimination to our nonsocial relations. Without it, to say the least, we and others would be continually interrupting one another. But this does not hold; others do not generally cut in on our actions as we see them; nor do they complain generally of the reverse. On the other hand, persons do not commonly see in the daily lives of their associates long trains of behavior which encompass lesser actions that differ in direction. It is only when one deliberately adopts the characteristic orientation of the psychiatrist, the counselor, or the biographer that this happens.

The third primary criterion of an episode refers to the potency relationship of part to whole within the total episode unit. It provides that an episode as a whole has greater potency than any of its parts.

Episodes are sometimes undivided, single-molar-unit events, as when a child only says "Yes" or "No" to a question. More often than not, however, an episode is divided into consecutive parts. These parts of the total episode are all lesser action-and-situation units. It holds, for every divided episode, moreover, that the person is "involved in" one of its part units or another at every moment while he is involved in the whole. The whole and the part coexist as units with some degree of independence, with each part both an action and a minor, dependent, included situation.

As a subordinate complex, every part unit of an episode makes a greater or lesser contribution while it is in progress to the whole of the ongoing behavior; each, compared with the whole, has a greater or lesser degree of importance for the total behavior of the person. In the con-

ceptual language of Lewin (15), every part, relative to the whole, has a greater or lesser degree of potency or weight. The potencies of the whole unit and any part unit are by definition relative to one another, so that, when the weight of either goes up, that of the other goes down. An important feature of this relationship is that the relative weights of part and whole can differ from one segment of an episode to another. The third primary criterion of an episode states that the potency of the whole episode must always be superior to that of any of its parts.

From this it follows that, if any part unit of a behavior sequence with a constant direction either exceeds or equals the whole in potency, that unit becomes a separate episode. The basic rationale of the principle is that when a part unit in the stream of behavior does equal or exceed in potency an including whole unit, established as such by constancy in behavioral direction, it takes precedence over the whole in the behavior perspective of the person and in the total dynamics of the continuing behavior.

In the application of this criterion during the episodizing process, indicators of high potency which have been found useful are (1) wide involvement of motor, verbal, and other behavior mechanisms, (2) indifference to potentially distracting conditions, and (3) high energy level of the behavior. Additionally, certain factors in the situation of the child are associated with high potency. These include (1) high resistance or obstruction and (2) strong interpersonal stimulation.

#### Episoded Excerpt from a Specimen Record

In order to illustrate briefly the analytical process described above, a short excerpt from an episodized specimen record is reproduced below and supplemented by references to the criteria of episodes. This excerpt is

taken from a day record on Dutton (Chuck) Thurston. The sequence begins at 7:32 in the evening on November 3, 1950, in the back yard of the Thurston home, where Chuck is sitting on the hood of a truck, while his father stands nearby.

Going Inside

7:32 The father called good-naturedly,  
"Come on, Chuck. Come along, boy."

Chuck jumped down easily and quickly.

He trotted a few steps ahead of his father.

Mr. Thurston caught up at the back door of the house. There he said briskly, as he opened the door, "Come on; let's get inside."

Chuck bounded into the house.

He walked quickly through the kitchen and dining room into the living room, where his mother sat resting on a couch.

He started to peel off his jacket.

Commenting on Cold

At the same time, he remarked companionably to his mother, "It's cold outside. It's really cold out there".

He said this in a very adult way.

Only smiling pleasantly, his mother seemed to take it that way.

Talking Off Wraps

7:33 Chuck pulled his jacket down from his shoulders; but it stayed on because the sleeves jammed against the bulky gloves he was wearing.

Taking Off Wraps

Getting Mittens Off

Chuck demanded of no one in particular, "Mittens off!"

His mother said nothing and made no move to help.

Chuck resolutely walked over to his mother.

Standing before her with his coat sagging, he soberly held out his hands.

The mother reached over toward him.

Then, while he helped by pulling back a little, she tugged off his gloves.

Chuck wriggled on out of his coat, letting it drop where he stood.

Putting Wraps Away

His mother said firmly, "Chuck, put your hat and coat away."

He just stood there.

Chuck asked, looking impish, "Shall I get the ruler, Mommie?"

Earlier in the day Chuck had refused to put away his wraps, whereupon his mother had said threateningly, "Now, where is my ruler?" So, in asking now if he should get the ruler, Chuck evidently was just beating his mother to the draw.

Chuck did not press the question about the ruler. Before his mother could answer it, he picked up his hat and coat.

Then he carried the wraps into the bedroom. He was smiling.

He returned to the living room at once.

The direction criterion is exemplified by the judgment that, so long as he behaved in the episode, Going Inside, Chuck was engaging without a break in the action which took him from a starting position—outdoors, on truck, near father—to a new position, inside the house, which he had intended to reach from the starting position. It is exemplified also by the judgment that, when Chuck began to take off his wraps, his behavior took a new directional "tack," whereupon a new episode began; and so on through the marked units.

Each of the episodes in this sequence of behavior illustrates action which lies within the behavior perspective of the person. In the judgment

of the episoder, the behavioral end which was most clearly in focus just after 7:32 for Chuck was to get inside the house. Other smaller units, such as the steps he took in going inside, seem to "go off" without any concern on Chuck's part. Nor is there any indication that what is marked as an episode, Going Inside, is in reality but a smaller included part of some longer unit such as "Having a good time with Father." The behavior might be so classified for some purposes but it was considered unlikely that Chuck saw it that way. After getting inside, Chuck begins a new episode, Taking off Wraps. At the same time, he remarks to his mother about the cold. This introduces a complication in episodizing which will be considered in more detail in the next chapter. It is that the person can engage in more than one goal directed action at a given time. When this occurs, the episodes are said to overlap. In the excerpt, Taking off Wraps and Commenting on Cold are overlapping episodes.

Finally, the third primary criterion of an episode is illustrated by the episode Getting Mittens Off. The action in this episode was considered to have the same direction as the action in Taking Off Wraps. But the episoder judged that, while Chuck was involved with the troublesome mittens, this lesser, included unit had at least as much weight or potency as the whole of the larger, containing segment of behavior. Getting Mittens Off was therefore singled out as a separate episode. Units which are individuated in this way by superior part potency are called contained episodes.

Before turning to a report of the reliability of episodizing, it should be stated explicitly that the above presentation of the episodizing process is only an outline of the most central ideas involved. A comprehensive discussion of this problem is beyond the scope of the present writing. A

systematic formulation of the basic principles of episoding has already been published (19) and a forthcoming publication (3) includes a consideration of many aspects of the problem.

### The Reliability of Episoding

Most of the episoding of specimen records at the Field Station was done during one year by a team of five analysts which included a supervisor who reviewed all of the work by the other four. The supervisor made some changes in the original episoding. Usually such changes were made only after consultation with the analyst concerned so that continuous training was provided.

Throughout, application of the method has been supplemented by procedures to test its reliability. This report includes findings obtained by use of these procedures on fourteen day records.

Sections varying in length from 30 minutes to 90 minutes and covering approximately one-fourth of the subject's waking time during the recorded day were marked off in each record. There were 50 sections in the total sample. These were chosen from different parts of the records to give variety in kinds of behavior and situation.

Eight analysts were paired under a rotation scheme which minimized disproportionate teaming of any two persons. One of the fifty sections was assigned to every pair, each member of which independently divided into episodes a transcript of the sequence recorded in the section. Following work on a sequence, the members of every pair jointly compared the independently divided transcripts. They recorded the title of every episode which either analyst had discriminated and checked all instances of agreement and disagreement. Agreement was credited whenever an episode marked by one analyst was essentially the same in span, content, and identifying

participial phrase as an episode marked by the other. Differences in the marking of units as isolated or overlapping were not scored as disagreements. As a rule, however, where there was agreement upon the identity of an episode, there also was agreement with respect to its position. Other characteristics of episodes were not considered in the comparisons.

For each of the episoded sections in the sample an agreement percent was secured by means of the following formula in which X and Y represent any two independent analysts.

$$\begin{array}{r}
 \text{Agreement} \\
 \text{Percent}
 \end{array}
 =
 \frac{\begin{array}{c}
 \text{Number of episodes discriminated} \\
 \text{by X discriminated also by Y}
 \end{array}}{\begin{array}{c}
 \text{Total Number of epi-} \\
 \text{sodes discriminated} \\
 \text{by X}
 \end{array} + \begin{array}{c}
 \text{Total Number of Epi-} \\
 \text{sodes discriminated} \\
 \text{by Y}
 \end{array}}
 \begin{array}{c}
 \\
 \\
 2
 \end{array}$$

The numerator of this formula is the number of episodes upon which the two independent analysts agreed. This is the best evidence we have of the correctly identified episodes. It is not, however, the true number of episodes, for it includes "episodes" with respect to which both episoders made the same error, and it does not include episodes correctly identified by one episoder and not so identified by the other. The denominator is the best estimate available of this true number of episodes. It is the mean number of episodes discriminated by both analysts. Its rationale is based upon the assumption that any competent analyst, trained in the method, will approximate the correct total number of units which the method defines as episodes, but that he will make errors of two kinds:

he will identify two or more episodes where there should be one (overestimate the number of episodes) and he will combine into a single one, two or more episodes where there should be more than one (underestimate the number of episodes). If these are chance errors, the averaging of the judgments of more than one judge should provide a better estimate of the true number of episodes than the judgments of a single judge. Thus, the quotient gives that proportion of the "true" number of episodes which were "correctly" discriminated by both of the analysts independently.

Application of this formula to the fifty sequences of the sample yields agreement percents ranging from a low of 72 to a high of 92. Table 1 presents a frequency distribution of these measures. An overall agreement percent was computed by summing for all 50 sections and then

Table 1

Frequency Distribution of Agreement Percents  
Obtained in Tests of Episoding Reliability

Agreement Percent	f
72-74	3
75-77	4
78-80	16
81-83	11
84-86	10
87-89	5
90-92	1
Total Number of Sections	50

substituting in the formula. This computation gives a value of 81.11, which represents the central tendency shown in the table.

The question of how to test statistically the significance of these data on interanalyst agreement presents a difficult problem in sampling theory. Some progress has been made in this area by Guetzkow (9) in his treatment of reliability problems met in "unitizing" the qualitative data in interviews, autobiographies, and the like. But for the present, the reported percents will be left as they stand.

### The Behavior Settings Survey

A third major method in psychological ecology requires brief identification. It concerns the community units which have been used in Midwest to study the psychological living conditions of children. These community units are called Behavior Settings. A behavior setting is defined as a standing pattern of behavior of men en masse together with the discriminable part of the physical-social-temporal milieu to which the behavior is attached with a perceived fittingness. For example, the behavior setting, Clifford's Drug Store, consists of the standing behavior pattern--buying, selling, visiting, taking refreshments, etc.--and the physical-social-temporal locus of this behavior, i.e., the building known locally as Clifford's drug store during business hours. The perceived fittingness of this standing pattern of behavior for this milieu locus means that the included behaviors are seen as appropriate to this particular place-time complex and that other behaviors are seen as inappropriate, e.g., dancing, singing, playing games.

Other standing behavior patterns and the milieu contexts to which they are attached are readily observable in Midwest. No special instruments are necessary to see the extraindividual wave patterns of behavior which persist despite constant changes in the individual persons involved in such behavior milieu complexes as the Presbyterian Worship Service, the High

School Basketball games, and the Post Office. Anyone in Midwest on a Sunday at noon can see the churches suddenly pour forth their congregations to hurry sedately away down streets and sidewalks. On any morning at 8:30 the behavior pattern is unmistakable in the Post Office: efficient business against a background of the relaxed conversation of the loiterers.

The behavior settings survey is a catalogue and description of the behavior settings of the community. According to the procedures developed at the Midwest Field Station, such a survey is highly comprehensive; it is estimated that the behavior settings of Midwest include 95 percent of all the behavior that occurs within the community (3). At the same time, the number of identifiable behavior settings in a town the size of Midwest is not only finite but manageably small. There are 2040 behavior settings in Midwest of which 1445 are within Midwest's families and 585 are public or community settings. The ordinary child has potential access to 10 or 15 family behavior settings in his own and other families plus the 585 community settings, making a potential world of 600 behavior settings (3). The behavior settings survey provides a psychological map of Midwest representing those areas of the town that have general behavioral significance to the citizens.

While the most significant value of behavior settings is their usefulness as community units for general descriptive and analytical purposes, they are also valuable as guides for the sampling of individual behavior within the community. As will be discussed in greater detail in the next chapter, the behavior settings survey was used in the present investigation for the latter purpose.

### The Problem of this Study

To episode a specimen record is to find boundaries between the parts of a whole behavior sequence. Once this is done, it is then possible to inquire into the relations of part to whole and part to part within the sequence without any reference to what the parts contain. This is to ask about the structure, anatomy, or geometry of the behavior continuum. The problem is analogous to the one presented by relations of part to whole and part to part of a skeleton, a plant, or a rock formation, except that, in the case of behavior with its context, the whole is extended in time as well as space.

Given a behavior sequence through a known period of time, to what extent, in the first place, is it differentiated into parts? How many episodes does it include? How many "things," for example, does a normal Midwest two-year-old do in a day? A Midwest four-year-old? How are the episodes of a behavior sequence related interpositionally, whatever the degree in which the total sequence is divided? To what extent do they occur one by one in single file? To what extent, on the other hand, do they overlap? And what variations occur in the form and complexity of such overlapping? This line of inquiry raises in turn a number of questions about factors associated with the anatomy of behavior. What conditions in the habitat of a person act at the beginning of an episode to get it underway or at its end point to break it off? Under what conditions does the behavior stream bifurcate so that episodes overlap? One can ask also about cross effects between different units of a sequence. When episodes overlap, for example, in what degree may they interfere with, complement, or reenforce one another? Such questions identify the problem of behavior structure.

## CHAPTER II

### WORKING PROCEDURES

#### Source Materials and Method of Sampling

The data of this study are based upon analysis of 16 episoded day-long specimen records, including 12 on Midwest children and 4 on physically disabled children of nearby communities. Brief descriptions of these children and their life situations at the times of their respective records are presented in the appendix.

For certain purposes, which will be considered later, all of the 14,991 episodes in the 16 records were used. For other purposes, however, efficiency required a sampling of this total episode population. A method was adopted whereby the episodes in the behavior settings entered by these children were sampled on a random basis.

An important value of behavior settings and the behavior settings survey is in providing guides for sampling the behavior in a community which are less arbitrary and closer to psychological reality than are the usual guides such as age, sex, and social class. The same principle holds for the sampling problem in the present study, viz., to select from the nearly 15,000 episodes in the 16 records a manageable sample of behavior with a minimal amount of bias. In this case, sampling in terms of the behavior settings which the children entered is less arbitrary than any other available method.

Earlier work by the Field Station staff included a complete analysis of each day-record according to the behavior settings which the child entered during the day. This analysis established for every entry of the child into a behavior setting the number and name of the

setting, the identifying numbers of all included episodes, and the time of occurrence and duration of behavior in the setting. The results of this analysis provided, then, a comprehensive, minute by minute breakdown of each recorded day in terms of behavior settings. It was decided to include in the episode sample from every record all the episodes that occurred during alternate entries into each setting.

This selection procedure had to be modified in order to avoid disruption of naturally occurring behavior sequences. In practice, this aim was achieved by respecting the structural integrity of episode linkages. A linkage is defined below (see p. 49) as a sequence of episodes connected with each other by overlapping. If any part of a linkage fell in a sample, the entire linkage was either assimilated to it or excluded; a linkage was included if only a few episodes outside the sampled setting were involved. These modifications made relatively small net differences in the number of selected episodes.

A major advantage in this basis of selection is that it gives approximately proportionate representation to behavior settings of widely differing degrees of importance, as measured by time spent in them by the children. Thus, nearly 40 percent of the behavior in the 16 records occurred in the setting, Home Indoors. The sampling scheme gives a similar proportion of episodes from this setting. Another advantage in the plan is that it preserves the natural continuity of extended behavior sequences.

These procedures gave a total sample of 7,749 episodes from nearly all of the different behavior settings entered by the 16 children. This is 51.6 percent of the entire episode population. The samples range in size from 45 percent to 56 percent of the episodes in each record.

## Descriptive Categories

With exceptions to be noted, the data reported in the chapter on results were obtained by applying special descriptive categories to all episodes in the sample from the 16 records. Some of these categories deal with purely structural characteristics of episodes, while others are concerned with dynamical factors or conditions related to behavior structure. Each category is itemized and defined below.

### Structural Characteristics of Episodes

#### 1. Episode Length

- 1 15 sec
- 2 30 sec
- 3 1 min
- 4 2 min
- 5 3 min
- 6 4 min
- 7 5 min
- 8 6-7 min
- 9 8-10 min
- 10 11-14 min
- 11 15 or more min

Category 1 provides a measure of length of episode in clock time. Each episode in the sample was rated on this variable. The judgments are made on a "nearest to" basis. For example, when an episode is checked One Minute, this means that, of the time intervals itemized in the category, a minute is nearest to the judged duration of the episode.

In judging length of episode, the analyst is guided by time notations recorded by the observer and the description of the child's behavior. The estimates required of the analyst here were considered to be such as to obviate necessity for systematic agreement tests.

2. Total Number of Overlapping Episodes

1	1
2	2
3	3
4	4
5	5
6	6-8
7	9-11
8	12-14
9	15 or more
10	DNA

As stated in Chapter 1, an important aspect of behavior structure is the overlapping of episodes. This category is used to record for the episode under analysis, or target episode, the total number of other episodes which overlap with it throughout its entire course. In Figure 1, for example, we find by counting that episode 1 has five other episodes overlapping with it. Episode 1 is tabulated, therefore, under item 5 of the category. Episodes 4 and 5 are both tallied under item 2, since each has 2 others overlapping with it. Every remaining episode in Figure 1 has only one other overlapping with it; hence, each is tallied with item 1. Episodes that have no other overlapping with them at any time are tabulated under item 10, Does Not Apply.

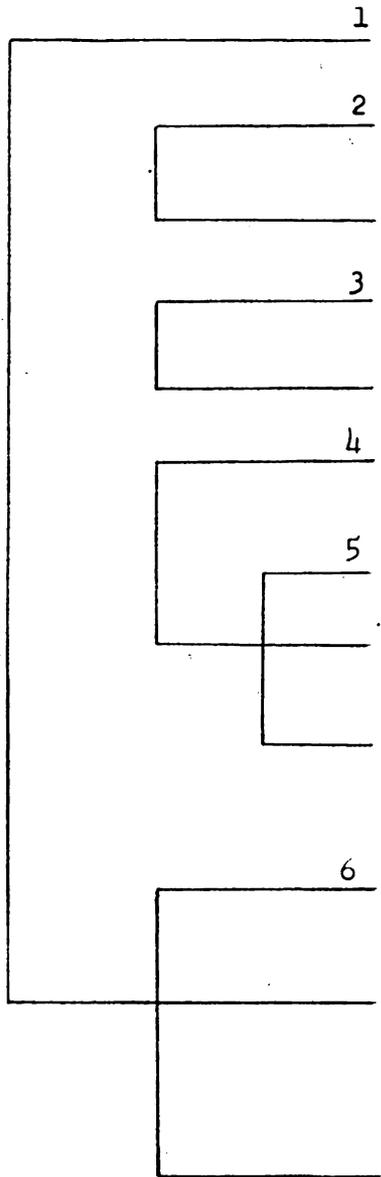


Figure 1

Different Ways of Tabulating Overlap Phenomena  
(see text, Categories 2 and 3)

For this category, as for categories 3 through 6, below, the evidence of reliability in application is indirect. Each of these categories deals with an aspect of behavior structure identified in the episoding process. The task of the structure analyst was only a matter of inspecting episode brackets or of counting episodes; interpretations which had been made previously as a part of the episoding process were noted and recorded. Thus, the question of reliability goes back in each case here to the episoding process itself, the reliability of which was tested by procedures described in Chapter 1 (see pp.16-19).

Our tests of episoding reliability, as may be recalled, measure only agreement between independent analysts on presence or absence of episodes. Such determinations as the position of units in relation to others were not considered in the agreement computations. It is clear, therefore, that the episoding agreement percents can be taken as only indirect and partial evidence of reliability of the present categories. It is considered, however, that where the reported agreement levels were high, agreement on episode interrelations is likely to have been satisfactory. It has seemed highly improbable that two episoders could agree acceptably in identifying particular episodes and yet disagree seriously on such variables as number of overlapping episodes or type of overlap. In view of these considerations, categories 2 through 6 have not been subjected to special reliability tests.

3. Maximum Number of Simultaneously Overlapping Episodes

- 1 1
- 2 2
- 3 3
- 4 DNA

Category 3 is used to record for the target unit the largest number of episodes which overlap with it at any one time during its course. Reference to Figure 1 will clarify the difference between this variable and Total Number of Overlapping Episodes. It was noted above that episode 1 in figure 1 has a total of five other episodes overlapping with it and that it is tallied, therefore, under item 5 of category 2. However, it will be seen that the largest number of episodes which overlap with episode 1 at any one time is two. Accordingly, item 2 of the present category applies to episode 1. On the same basis, item 1 applies to episodes 2, 3, and 6, and item 2 to episodes 4 and 5.

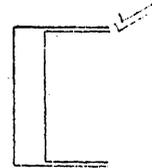
4. Type of Overlap

- 1 Coinciding
- 2 Enclosing
- 3 Enclosed
- 4 Interlinking
- 5 Interpolated
- 6 DNA (Isolated Episode)

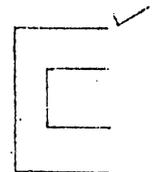
Attention is turned now from quantitative to qualitative aspects of overlapping phenomena. Category 4 is used to describe the structural form of relationships between overlapping episodes.

In applying this category, the analyst records the form of the relationships between the target episode and other episodes by checking one or more of the six items. These items are defined and illustrated below. Each bracket represents one episode as in the excerpt beginning on page 12, and every check mark denotes an episode to which the definition on the left refers.

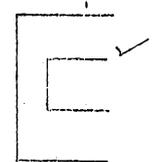
A coinciding episode is one such that the whole of it overlaps with the whole of another.



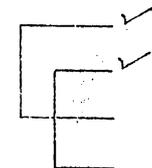
An enclosing episode is one such that a part of it overlaps with the whole of another.



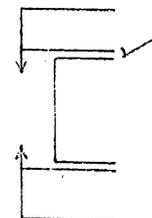
An enclosed episode is one such that the whole of it overlaps with a part of another.



An interlinking episode is one such that a part of it overlaps with a part of another.



An interpolated episode is one which occurs between segments of a discontinuous episode.



An isolated episode is one which does not overlap with any other.



Item 5, Interpolated, raises the related questions of the continuity and the completeness of behavior episodes. Although these questions are considered in detail under categories 6 and 11 respectively, the episoding practices which underlie the marking of interpolated episodes need to be indicated here.

One obvious fact about molar behavior is that it does not always proceed directly and continuously from a starting point to an originally intended terminal position. Sometimes, after having set out toward a goal, a person may either temporarily or permanently abandon his efforts to reach it. In episoding a specimen record, the practice has been to identify the temporary abandonment of an episode by breaking the vertical line of the episode bracket and adding downward and upward pointing arrows to the earlier and later segments, respectively, of the bracket. This is illustrated in the diagram opposite the definition of an interpolated episode, above. These markings identify a discontinuous episode. Episodes which occur between the segments of a discontinuous episode are interpolated. Other examples of interpolated episodes are shown in Figure 2. In this figure, episodes 11-c and-d, 12-c,-d, and-e, and 13-c,-d,-e, and-f are interpolated.

In contrast to other categories, the items of this category are not mutually exclusive. Wherever a target episode sustains more than one type of overlap relation to others, each type is checked. Thus, in Figure 2, episode 6-a is interlinking in relation to episode 6-b, but enclosing in relation to 6-c. For episode 6-a, therefore, both items, Enclosing and Interlinking, are checked.

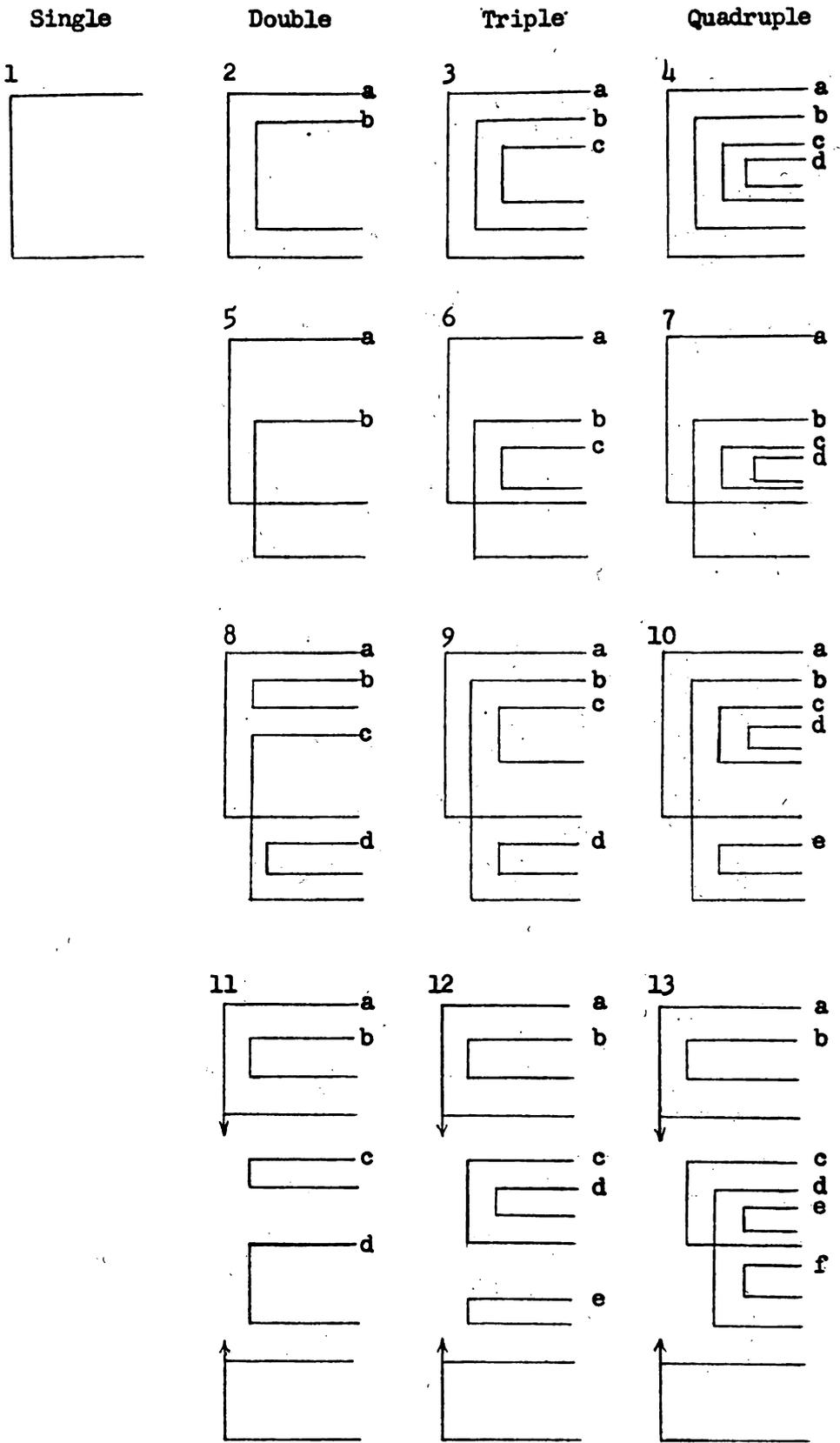


Figure 2

Common Linkage Types

## 5. Form of Transition

- 1 Abrupt
- 2 Merging

Category 5 is concerned with the structural relationship between the target unit and other episodes at its terminal point, i.e., at the point of transition to the immediately subsequent behavior segment, which can be a new unit or the remaining part of a more extended overlapping episode. The category might be said to measure smoothness of behavior flow. Where an abrupt transition occurs, the target unit is immediately succeeded by a break in the behavior sequence. Where, on the other hand, a merging transition occurs, the target unit ends while an overlapping episode is still in progress. Figure 2 shows that, among others, episodes 1, 2-a, 6-b, and 12-c are characterized by abrupt transitions. Examples from this figure of merging transitions include episodes 2-b, 6-a, and 12-b.

## 6. Continuity of Episode Course

- 1 Continuous
- 2 Discontinuous

The occurrence of discontinuity in the temporal course of an episode has been discussed earlier. It is necessary here, however, to specify more precisely the basis for a judgment of the continuity of an episode course.

Item 1, Continuous, applies where the target episode proceeds continuously from its beginning to the point of final termination. In terms of the conceptual criteria described earlier, an episode is considered continuous if it is judged to maintain potency greater than zero throughout its course, regardless of whether the goal of the episode is reached.

Item 2, Discontinuous, applies where the judged potency of an episode drops to zero at some point short of the goal and then later assumes again a value greater than zero. This may occur more than once during the course of a single episode and in fact was judged to occur no less than 20 times in one case.

From these definitions it is clear that judging the continuity of an episode amounts to estimating whether its potency drops to zero at some point short of the goal. The concept of potency refers specifically to the degree in which the total behavior of a person is determined by the forces of a situation which the person has entered and in which the person is presently behaving. To say that a person is in a situation is to say that its forces are now operative in some degree, so that it has some importance for the total ongoing behavior. Conversely, the judgment that a situation has zero potency means that the person is not in the situation, that its forces are not operative and that it has no importance for the total ongoing behavior. Thus, for example, the episode, Eating Supper, in the Mary Ennis record was judged to be discontinuous when she left the table for a few minutes shortly after starting the meal to visit energetically with some newly arrived playmates in the backyard. In this case, the Eating Supper episode was judged to have zero potency during the time occupied by the episode, Telling Friends About Sand-pile.

It should be noted that this category is in no way concerned with the ultimate completeness of an episode. A judgment is not made here as to whether the child ever reaches his intended terminal position. The question of completion or incompleteness is raised by a later category.

Conditions Related to Behavior Structure

7. Actone Interference Between Overlapping Episodes

- 1 Simultaneous Occurrence of Same Actones
- 2 Simultaneous Occurrence of Different Actones
- 3a Partly Same Actones
- 3b Alternating Occurrence of Different Actones
- 4 Alternating Occurrence of Same Actones

Actones have been defined as molecular behavior units that mediate or implement molar behavior (19, pp. 88-96). The present category attempts to measure the extent to which actones implementing two simultaneously overlapping episodes are interfering. It differs from all other categories of the instrument in that the target of analysis is not an individual episode, but one aspect of the relationship between episodes which overlap.

The category provides for judgments on different combinations of two variables, namely, (1) simultaneity of occurrence of actones and (2) similarity of actones. A single rating expresses the extent of interference between mediating actones in terms of these two variables.

Actones implementing different overlapping episodes are considered to be simultaneous only if they actually occur at the same moment of clock time, so far as the analyst can judge from the observer's report. This judgment always is made in terms of what actually happens, not in terms of what could occur. Consider, for example, Asking Mother about Father and Looking Out of Window as overlapping episodes. It is possible for the actones of these two units to occur simultaneously; one can talk and look at the same time. But this is not the question. Rather, we want to record whether the "talking" actones and the "looking" actones actually

do occur at the same time. In this example, they did occur simultaneously, which means that item 2 applies; but they could have occurred alternately, in which case item 3b would have applied.

Similarity of actones is judged in terms of three possibilities. The analyst indicates whether the two overlapping units utilize the same actones, whether some but not all actones are common to both, or, finally, whether the actones are entirely different. For example, Watching TV and Looking Out of Window are mediated by the same looking actones and no others. Playing with Toy Truck and Watching Mr. Thomas are mediated by some of the same actones, namely, those involved in looking; but crawling and manipulation of objects are unique to the truck unit. Finally, Eating Supper and Listening to Conversation have no actones in common.

Whether actones are considered the same or not depends, in part, upon how specifically they are identified. If one wants to be highly specific, every actone is different from every other, e.g., writing requires slightly different hand movements than does drawing. It is also possible to use such broad classifications that only gross differences are recorded, e.g., motor, perceptual. Our policy has been to identify the actones on an intermediate level of generality in which similarity is coordinated roughly to the capacities of the person which are utilized in the behavior. At this level we identify actones such as "using hands" and "using feet," rather than motor; "looking" and "listening," rather than perceptual.

The analyst considers only those actones which are most specific to the execution of the behavior of the episode. In general, the actones which are specific to an episode stand out from other, more general ones in a way which is analogous to a figure-ground relationship. For example, the actones which are specific to Eating Supper, are "using hands," "oral

movements," and "looking." But there are others which provide something of an actone background in the sense that they are more or less common to all episodes, e.g., "postural adjustments" and "thinking." For the purposes of this category, these background actones are not considered. Thus, although Eating Supper and Listening to Conversation do involve some of the same background (postural) actones, we record a rating of 2, i.e., simultaneous occurrence of different actones, for the special actone systems of "using hands" and "listening."

The five items of the category provide a series of unevenly distributed points on a rough continuum of interference ranging from low interference (item 1) to high interference (item 4) as shown below.

1. Simultaneous occurrence of same actones. Here, a sequence of movements is at the same time a part of different simultaneously occurring actions. Like a stretch of roadway which for a short way effectively carries different highways going in different directions, actones which are concurrently functioning parts of different actions cannot be seriously interfering. When the same part is included in two or more simultaneously functioning wholes, its dual aspects must be highly congruent. When Sue Dewall ignored a questioning classmate by pointedly continuing with her coloring, her hand movements concurrently performed two actions, i.e., "coloring" and "being occupied." The dual significance of the same actones is sufficiently frequent to be described in common speech by such expressions as "killing two birds with one stone" and "double talk."

2. Simultaneous occurrence of different actones. If an arrangement such as that described under item 1 cannot occur, the possibility of simultaneous actones in overlapping episodes is limited, for one of the basic characteristics of the psychological person is its unitary nature. A person cannot "go off in all directions at once." At all levels, both molecular and molar, and motor, perceptual, and conceptual, the number of different actions which can simultaneously occur is strictly limited. A person cannot study a complex legal brief and follow the propositions of a geometrical theorem at the same time. Automatization of one of the overlapping actions increases the possibility of their concurrent occurrence. But automatization of molar actions has very limited possibilities; directedness by the self is a fundamental feature of molar behavior. Some interference is inevitable when different actones occur simultaneously. On the other hand, the fact that the actones occur simultaneously means that the interference is not complete. Otherwise they would occur in alternation. The simultaneous occurrence of different actones indicates some, but not maximal, actone interference. An example of this occurred when Ray Birch listened to his parents' conversation while eating his breakfast.
- 3a. Partly same actones. This item covers overlapping episodes in which both identical and different actones were involved and where the former occurred in alternation and the latter either simultaneously or in alternation. For example, as Sue Dewall

was getting dressed in the morning, she gave the observer a smiling glance of recognition. In this case, both episodes utilized "looking" actones in alternation, but Getting Dressed employed other actones, e.g., "using hands," which continued while Sue looked at the observer. The degree of interference characteristic of episodes checked on this item derives in some degree from the conditions described under item 2, 3b, and 4. In a population of unselected cases of overlap with partly same actones, the degree of interference would lie between items 2 and 4 of the scale.

- 3b. Alternating occurrence of different actones. Alternation has to occur when the two sets of actones are seriously interfering. However, it may occur when the interference is not so great as to require alternation, as in item 2. In any mass of unselected alternating actones, the degree of interference will be greater than that described under item 2, but less than maximal. One example of this item occurred when Sue Dewall momentarily stopped building a barn with blocks in order to beg the teacher to prevent the other children from tearing it down.
4. Alternating occurrence of same actones. The occurrence of the same actones in alternation between two episodes represents the highest degree of actone interference on the scale. When, for example, Sue turned from her conversation with Hilda to answer Verne's question, the degree of interference between the actones implementing these episodes was high in the sense that they were mutually exclusive.

These five items are conceived to span only an intermediate part of the interference continuum. Below the low end of the scale are all instances of overlap involving contained and containing episodes, which by definition (see pp. 10-16) do not differ in direction and are, therefore, congruent. But for its high potency, each contained episode would be a part of the parent unit with which it overlaps. Accordingly, overlapping contained and containing units are excluded from analysis by the category. Above the high end of the interference scale are interpolated and isolated episodes whose incongruency with other units is so great as to preclude overlap with them.

This is one of four categories upon which specific agreement tests were made. An assistant applied each of these categories to a number of episodes which the principal analyst had previously judged. In all, there were eight blocks of 50 episodes each in the agreement sample. These blocks were taken from eight different records. They were selected, moreover, from different behavior settings in order to provide a variety of target material.

Two hundred and fifty three cases of simultaneous overlap occurred among the 400 episodes of the sample. In 66 percent of these, the independent analysts agreed completely in applying the category. The agreement percents for the eight blocks of episodes range from 43 to 89 with a median of 67. These relatively low values are mitigated somewhat by the further finding that, in 70 percent of all disagreements, items checked by the analysts were adjacent on the scale (counting items 3a and 3b separately). In other words, the analysts agreed within one point in 90 percent of the cases.

## 8. Basis of Episode Discrimination

- 1 Direction
- 2 Potency (Contained Episode)

Category 8 differentiates between contained episodes discriminated solely on the basis of their relatively high potency (see pp. 10-16), and episodes discriminated on the basis of unique direction.

The analyst merely notes whether the target unit has been marked a contained episode during the episoding process. Thus, the question of reliability again goes back to agreement on episoding. In this case, however, no evidence of interanalyst agreement is available; differences between independent episoders as to whether a given episode was contained were not considered in the episoding agreement tests.

## 9. Relative Weight

- 1 Primary
- 2 Primary, Tied
- 3 Secondary
- 4 Tertiary
- 5 Primary, Secondary
- 6 Primary, Tertiary
- 7 Secondary, Tertiary
- 8 Primary, Secondary, Tertiary
- 9 Does Not Apply (Isolated Episode)

Category 9 is concerned with the potency, or relative importance to the total behavior of the child, of different simultaneously overlapping episodes. The weight of every episode among two or more involved in an overlap at one time is ranked in order from primary through

tertiary. Occurrence of more than three simultaneously overlapping episodes has been found so rarely in our records that no provision was made for this in itemization of the category.

The first item applies when the target episode clearly outranks the other overlapping units in potency throughout its entire course. Item 2 applies when the first rank in potency is shared by the target unit and another episode at some point during the course of the target episode, i.e., when neither episode appears to have greater potency than the other. Actually, an episode of secondary weight could be equaled in potency but our experience has not required provision for this possibility. Whenever three episodes were found to overlap simultaneously, one of them was always clearly tertiary.

The remaining items represent combinations of items 1, 3 and 4. These are used when an episode of some length is judged to have different weights at different times during its course. The relative weight of a long, enclosing episode, for example, is not necessarily constant throughout its course but may vary from time to time, depending upon the characteristics of the episodes which it encloses. Thus, for example, item 5 applies when the target episode is primary in potency through a part of its course but is secondary at one or more points.

As mentioned earlier, the indicators of high potency which have been used in episodizing the records include (1) wide involvement of motor, verbal, and other behavior mechanisms, (2) indifference to potentially distracting conditions, (3) high energy level of the behavior, (4) high resistance or obstruction, and (5) strong interpersonal stimulation.

Judging episodes on relative weight becomes a matter of deciding which of the overlapping units makes the most difference to the total behavior of the child in terms of these indices.

The category was judged on the basis of relative weight markings which were placed on the episode lines as a final step in the episodizing process by the leader of the episodizing team. Since no agreement checks were conducted, the results from this category must be offered on this qualified basis.

#### 10. Episode Initiation

- 1 Spontaneous
- 2 Instigated
- 3 Pressured
- 4 Can Not Judge

Category 10 stems from an interest in the extent to which the structure of naturally occurring behavior is self-regulated rather than regulated from without.

The first item, Spontaneous, applies whenever the action of an episode begins in the apparent absence of external instigation, defined as any observed and reported change in the child's situation. In these cases, the child is seen to behave as if he "just happened to think of something to do"; i.e., action is initiated without evident dependence upon active behavior objects. When, in the case of social behavior objects, the child is seen to react to the presence, as opposed to the activity, of an individual, the initiation is considered spontaneous, as when Lewis Hope was observed to interrupt his paper-reading father long enough to get some information about a camera. In all cases of spontaneous initiation, the essential element is an apparently voluntary "selection" of action by

the subject. One clearly cannot assume in any such case anything like complete detachment from environmental conditions. Yet it has been found that behavior with the appearance of spontaneity stands out in the records, and it is believed that sense made by findings to be reported has justified special consideration of this behavior.

Item 2, Instigated, applies when the child is seen to respond to some observable event or change in his situation, provided only that the event or change does not constitute "pressure" as this is defined below. An event or change here means any observed and reported occurrence referable to some source other than the subject. Someone enters the subject's presence; a tractor drives past on the street; someone speaks; a paper flutters; a whistle blows; a clock chimes; a book falls. This item aims to measure the extent to which the child behaves in response to such incitement.

The third item, Pressured, applies when an episode appears to begin as the result of any form of pressure upon the child. Pressure means here external influence of any kind which is in any way inconsistent with the child's own momentary needs and goals. Although social pressure accounts for a majority of these cases, other kinds of pressure are included, as when Raymond Birch was "forced" by rain to leave his play and go indoors. Practicing Piano Lesson, which began when Raymond's mother called him in from his play to carry out this apparently unpleasant ritual, exemplifies the more common socially pressured initiation.

Results of the agreement tests on this category show exact agreement between independent analysts in 91 percent of 400 episodes. Taken separately, the agreement percents for each of the eight blocks of episodes range from 80 to 98. The median of these values is 91.

11. Episode Issue

This category is used in an attempt to describe some aspects of the psychological significance of the target episode for the child at the point of episode termination. It seems important to ascertain the frequency with which such psychological outcomes of behavior units as "success" and "failure" occur in any attempt to study the structure of behavior.

In applying the category, a decision was made first as to whether the episode was complete or incomplete. In the case of transitive or goal-seeking behavior, this amounted to deciding whether or not the child reached his goal. In the case of consummatory behavior, i.e., behavior within a goal region, the analyst judged only whether or not satiation occurred. When confident judgment as to the completeness of an episode could not be made, the analyst marked the unit Can Not Judge. If, however, the analyst was able to make a judgment as to episode completeness, the category was applied as it is itemized below.

- |                   |   |                        |
|-------------------|---|------------------------|
| Complete Episodes | 1 | Acquittance            |
|                   | 2 | Attainment             |
|                   | 3 | Gratification          |
|                   | 4 | Success                |
|                   | 5 | Consummation: Satiated |
|                   | 6 | Other                  |

- Incomplete Episodes
- 7 Nonattainment
  - 8 Frustration
  - 9 Failure
  - 10 Consummation: Not Satiated
  - 11 Other
- 12 Can Not Judge

A set of criteria was adopted for each item. Any given item applies only when all of the stated criteria are met. These items, together with the criteria and references to examples from the specimen records, are shown below.

1. Acquittance

- a. The action consists of a single minimal molar unit.
- b. The action is characteristically brief.
- c. Resistance against action is virtually zero.
- d. The episode is "unimportant." If involved in an overlap, its relative weight is secondary or less.

Example: At 9:48 in the morning of the Ben Hutchings record, Ben was busily occupied at his desk with the reading lesson for the day which involved reading, coloring, and some writing. While doing this, he glanced up momentarily to look at the first graders who were reciting orally to the teacher. This episode, Noting First Graders, meets the stated criteria for the issue, acquittance.

2. Attainment

- a. The goal in the episode is reached only after the child has overcome appreciable resistance.
- b. The child does not attribute credit to himself or to anyone else for reaching the goal; there is satisfaction but neither pride nor gratitude.

Example: At 6:03 p.m., Douglas Crawford climbed high up in a large elm tree in his yard. After finding a suitable perch, he worked vigorously in cutting a small branch from the tree with a knife. After about two minutes of engrossed work, he cut through the branch and threw it to the ground, satisfied with the accomplishment.

### 3. Gratification

a. The goal is such that the child could not reach it, if he were to do so by his own efforts, without overcoming appreciable resistance.

b. The child attributes credit for reaching the goal to someone besides himself or to external circumstances.

Example: When Dutton Thurston's brother, Al, spontaneously offered him a piece of chewing gum, the episode, Getting Gum from Al, was considered to meet the above criteria.

### 4. Success

a. The goal in the episode is reached only after the child has overcome appreciable resistance.

b. The child attributes credit to himself; there is satisfaction and pride in accomplishment; the child feels that he has "done something."

Example: On the evening of the Margaret Reid record, she, her mother, and her grandparents spent more than an hour in the yard enjoying the pleasant June evening. At 8:05, Margaret's grandfather noted that her 18 month-old brother had wandered off to the back part of the yard. Margaret at once caught up with him and gave him a couple of swats with a small stick. She then returned to the adults announcing, "I gave him a big spanking." She seemed very proud of her accomplishment which she justified by saying, "He did something wrong once."

### 5. Consummation: Satiated

a. Resistance against locomotion is virtually zero; the child is free to move about with little or no difficulty.

b. All activity regions are homogeneously positive; there is virtually no valence differential between any present position and any next step.

c. Distance to ends sought is virtually zero.

d. The episode terminates because the child becomes satiated with the goal activity; the activity becomes neutral in valence.

Example: At 8:07, Roy Eddy sat down to breakfast with his older siblings, two sisters and one brother. The breakfast consisted of prepared cereal, buttered toast and hot chocolate. These foods seemed to be Roy's favorites for he ate heartily and with obvious pleasure. He appeared to be just where he wanted to be doing just what he wanted to do for the next 15 minutes. That the episode terminated in satiation is indicated by Roy's comment as he pushed himself away from the table with a big sigh, "Whohh, I'm plumb full now."

6. Other (Complete)

This item is used when a judgment of "complete" seems correct, but when the criteria for no one of the above issues are met.

7. Nonattainment

- a. The child gives up only after overcoming appreciable resistance.
- b. The child does not place any blame for not reaching his goal; the nonattainment is taken for granted.

Example: At 7:40 p.m., Margaret Reid, with the assistance of her mother, tried to learn how to whistle. Her mother demonstrated whistling and Margaret tried several times to imitate her mother's action. After about a minute of this experimentation, Margaret gave up, apparently tired of the effort, without making a whistle which suited her. This episode, Trying to Whistle, exemplifies this issue. Item 9, Failure, would have applied in this case if Margaret had blamed herself. There is no evidence that she did. Rather, she apparently decided that this skill was only to be mastered by older persons, thus she did not feel "bad" about her own inability to whistle.

8. Frustration

- a. The child gives up only after over coming appreciable resistance.
- b. The child places blame for not reaching the goal upon someone besides himself or upon external circumstances.

Example: In the afternoon after school on the day of the Ben Hutchings record, Ben and his friend, Morris, were playing "war" with toy soldiers and airplanes on the floor of the kitchen in the Hutching's home. At 4:30, the boys got into a quarrel about the rules of their game. The quarrel deteriorated into a scuffle which ended only with the intervention of Ben's mother. Since Ben failed after considerable effort to reach his objective in this Quarreling Over Rules episode, and since it was clear that he blamed Morris and his mother, the episode exemplifies the issue, frustration.

9. Failure

- a. The child gives up only after overcoming appreciable resistance.
- b. The child places blame for the failure upon himself; he feels not only dissatisfaction, but also some shame.

Example: Raymond Birch went out in the yard to watch his father practice casting with a fishing rod. When he had a turn at casting, Raymond tried three times to make the plug land in a basket some distance away. He missed the first two times and produced a backlash on the third try. Raymond commented, "I can't put it in the basket" (6, p. 33).

10. Consummation: Not Satiated

- a, b, c. Same as for item 5, above.
- d. The episode terminates because of a factor other than satiation, e.g., new positive valence, social pressure.

Example: About 10:39 a.m., Mary Chaco, who was playing with first one thing and then another in her yard, picked up the rope tied to the handle of her wagon and pulled the wagon a short distance, apparently just for the fun of it. Then, as though struck by a new idea, she dropped the wagon handle and went to her tricycle. The episode, Pulling Wagon, is representative of many episodes involving essentially consummatory behavior which terminate, not as a result of satiation, but of an environmental change, such as a new positive valence, as in this case.

11. Other (Incomplete)

This item is used when a judgment of Incomplete is made, but when the criteria for no one of the above issues are met.

Results of the agreement tests show that exact agreement between independent analysts occurred in 56 percent of 400 episodes. The agreement percents for each of the eight test blocks range from 26 to 74, with a median of 59. These data for the individual items of this category are not reassuring. They leave open to question findings on the precise termination of individual episodes. However, it is important to remember here that we are dealing with large numbers of cases. If the errors of judgment are random, as there is reason to believe they are, considerable

confidence can be placed in the frequency of occurrence of different kinds of episode issue. Separate agreements were computed for judgments on episode completeness. They show that the analysts agreed on 81 percent of the 400 episodes. The percents on each block of fifty range from 64 to 98, with a median of 83. This means that judgments as to whether episodes terminated, in general, satisfactorily (complete) or unsatisfactorily (incomplete) were made with a good degree of agreement.

## 12. Episode Termination

- 1 Spontaneous
- 2 Instigated
- 3 Environmental Cessation
- 4 Pressured
- 5 Can Not Judge

This category complements and is patterned after category 10, above, on episode initiation. Item 1, Spontaneous, applies where the action of the episode appears to terminate from within. If the child apparently just quits on reaching his objective or tiring of the action, termination is judged to be spontaneous. Ruled out here are all cases of termination in response to observed and reported change in the child's situation.

Item 2, Instigated, applies where termination of the episode appears to occur in response to an external change or event provided that this change (a) does not consist in reaching the goal of the episode, and (b) does not conform to items 3 and 4 below which, as will be seen, are only

special cases of instigated termination. This item is directly analogous to the one of the same name under category 10; the definitions and examples cited there are applicable here as well.

The third item, Environmental Cessation, applies where the episode terminates owing to withdrawal of necessary behavior supports, as when one stops watching a movie because the film breaks. This, as anticipated above, may be considered a special type of instigated termination. Not all instances of environmental cessation are as clear cut and obvious as that of the cited example. This kind of termination occurs whenever the behavior of the episode is sustained by forces external to the child and then brought to an end by disappearance of these forces. Dutton Thurston is playing with his truck on the floor. He looks up to answer a question put by his mother only to find that she has left the room. Here, the terminating factor in Answering Mother's Question was judged to be environmental cessation. A somewhat different example of the same kind of termination is given by the episode, Watching Observer, which terminated when the observer left the room.

Item 4, Pressured, applies where the episode terminates as a result of external pressure on the child. The definitions and examples given for the item of the same name in category 10 can be adapted here.

Agreement tests show that independent analysts achieved exact agreement on this category in 82 percent of 400 judgments. The percents for each block of fifty range from 70 to 94, with a median of 82.

### Special Pattern Factors

The marking conventions used in episodizing a specimen record hold information about the patterning and differentiation of behavior sequences which can be obtained readily by simple inspection and counting procedures. Such procedures have been used to obtain data on both episodes and linkages as behavior parts. These data are based upon study of all episodes and linkages in each of the 16 episodized day records. They are derived partially from distinctions as to kinds of linkages, which will be identified briefly before turning to the chapter on results.

A linkage is a sequence of episodes connected with each other by overlapping. The minimal sequence is an isolated episode, otherwise identified as a link. Linkages range upward in complexity to those including as many as 50 or 60 episode links. Figure 2, presented earlier, illustrates some of the more common patterns formed by these linkages. The columns show different complexity levels of simultaneously overlapping episodes, ranging from the isolated episode or single link to the pattern of four simultaneously overlapping episodes. The examples in each row are intended to show that the number of episodes which overlap sequentially is variable for each pattern of simultaneous overlap. Thus, in the case of linkages at the level of triple overlapping, exemplified in the third column, the total number of episodes may vary from a minimum of 3, as in the first row, through 6, as in the last row, on up to as many as 50 or 60. Data on these different patterns have been tabulated and are reported in the next chapter.

CHAPTER III  
RESULTS AND DISCUSSION

Findings of this study will be presented under (1) purely structural characteristics of behavior and (2) conditions related to behavior structure. In the case of each variable, the order of consideration of results will be (1) the basic results for the 12 Midwest children, (2) any evidence on relationships with age, and (3) comparisons between the physically normal children of Midwest and the four disabled children.

The data on disabled children are too limited to permit definite conclusions; but it is hoped that they may provide leads for later and more extensive studies.

The results to be reported will represent only a part of the available data. Problems not considered include questions of relationship between structure variables and behavior settings, the sex, social class, and family situations of the subjects, and also questions of relationship between major variables of the descriptive scheme. These are some possibilities for future investigations which would use the present data.

Aspects of Behavior Structure

Number and Duration of Episodic Linkages

Table 2 shows some of the results from the study of linkages in the 16 records; the spatial groupings separate the twelve physically normal Midwest children, Mary Chaco through Claire Graves, from the four physically handicapped children, Wally Wolfson through Verne Trennell.

Within each group, the children are listed here and in subsequent tables in order of increasing age.

The first column shows that the number of linkages in each record varied from 135 to 683, with a median for the Midwest children of 428.

In order to make valid comparisons between the different children, it was necessary to adjust the figures in Column 1 for differences between children in length of day record. The difference in time between the longest record (Mary Ennis; 14 hrs., 27 mins.) and the shortest (Lewis Hope; 11 hrs., 8 mins.) was 3 hours and 19 minutes. Obviously, such differences must be taken into account in comparisons which are, in part, dependent upon the duration of the record. Therefore, the figures given in Column 1 were adjusted for these time differences by applying the formula below to the data from each record. This reduced all records to the temporal base of the shortest day, i.e., 11 hrs., 8 mins.

$$\text{Adjusted N of linkages in record X} = \frac{\text{Duration of shortest record}}{\text{Duration of record X}} \left( \text{Actual No. of link-ages in record X} \right)$$

The adjusted numbers of linkages are given in Column 2, which shows a range from 105 to 683. The differences between children are not distributed randomly; there is a relationship with age, as shown by a rank order correlation coefficient between adjusted number of linkages and age of -.67, significant beyond the 1 percent level.\*

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\* The term "level" as used in connection with tests of statistical significance refers to an absolute probability, P, i.e., a "two tailed" test of significance. For example, the phrases "5 percent level of significance" and "P equals .05" are synonymous.

In Column 3 of Table 2, the average number of episodes per linkage is given for each child. Here, Jimmy had the smallest average, 1.56, and Claire the largest, 3.66. The median for the Midwest children is 2.35. Again, relationship with age is apparent from inspection of the table; and this is demonstrated by a rank order correlation of .73, significant well beyond the 1 percent level.

Finally, the data on average duration of linkage are shown in Column 4. For these values, the range is 0.98 minutes to 6.37 minutes, the median duration is 1.88 minutes, and the correlation with age  $+ .67$ , definitely significant, again. The data in Columns 3 and 4 are not, of course, independent of those in Column 2; for, with length of record held constant, where the total number of linkages in a record is smaller, each linkage must include more episodes and last longer.

These data indicate that for the older children there is consistently a higher degree of connectedness among the episodes; the older children tend to keep more activities going at a given time; they more frequently begin a new action while still finishing an earlier one. On the other hand, the younger children are more often completely absorbed by a single action and do not as frequently begin a new one without ceasing the earlier action. Typical sequences for younger and older children are shown in Figure 3. Five linkages are shown for the younger child and one for the older; the data in Column 2 show that in some cases, as in that of Lewis (2-11) versus Claire (10-9), this ratio is more than 6 to 1.

There is no suggestion of a difference in the linkage patterns of disabled and normal children. This is of some importance for its

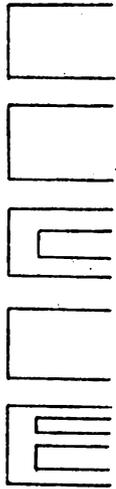
Table 2

## Number, Partition, and Duration of Episode Linkages

Child	Age to Nearest Mo. (yrs.-mos.)	Col. 1 Actual No. of Link- ages	Col. 2 Adj. No. of Link- ages*	Col. 3 Ave. No. of Episodes per Linkage	Col. 4 Ave. Duration (Minutes)
Mary Chaco (MC)	1-10	667	626	1.65	1.06
Jimmy Sexton (JS)	1-11	656	653	1.56	1.02
Lewis Hope (LH)	2-11	683	683	1.95	0.98
Dutton Thurston (DT)	3-10	544	471	2.13	1.42
Margaret Reid (MR)	4-6	427	357	2.48	1.87
Maud Pintner (MP)	5-0	499	491	2.39	1.36
Roy Eddy (RE)	6-2	249	206	2.80	3.24
Ben Hutchings (BH)	7-4	296	264	2.28	2.53
Ray Birch (RB)	7-4	430	353	2.32	1.89
Mary Ennis (ME)	8-7	370	285	2.62	2.34
Douglas Crawford (DC)	9-2	307	240	3.06	2.78
Claire Graves (CG)	10-9	135	105	3.66	6.37
Wally Wolfson (WW)	4-3	390	381	2.32	1.75
Sue Dewall (SD)	7-1	138	113	5.59	5.66
Bobby Bryant (BB)	7-4	225	193	3.03	3.45
Verne Trennell (VT)	7-5	307	238	3.18	2.80

\*Adjusted for differences between children in length of day record

Younger



Older

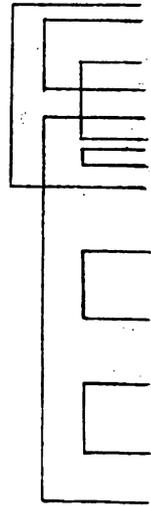


Figure 3

Typical Sequences of Episodes  
for Younger and Older Children

suggestion that peripheral disablement does not necessarily interfere with behavior complications of the kind occurring in long linkages. Of especial significance in this regard is the fact that Sue Dewall, despite severe motor disability, had the highest number of episodes per linkage.

#### Levels of Overlap in Linkages

Table 3 shows the percent of linkages occurring at each of the four levels of episode overlapping illustrated in Figure 2. It is clear from this table that single links or isolated episodes are preponderant. A trend, suggested by inspection, toward a higher percentage of linkages in the older Midwest children at the dual, triple, and quadruple levels of overlapping is not demonstrated by a significant rank correlation when each level is treated apart from the others.

It is important to note that every unit contributing to the percents in the single column represents a single isolated episode, whereas in the other columns, each unit must include at least 2 episodes and often as many as 25 or 30. Table 4 gives the percent of episodes at the triple and quadruple levels. For example, Table 3 shows that only 2 percent of the linkages in Mary Chaco's record occurred at these levels of overlapping but, from Table 4, we see that this 2 percent included 8 percent of the episodes in Mary's day. This discrepancy is even more striking with the older children. Thus, although 7 percent of the linkages in Douglas Crawford's record occurred on the triple or quadruple levels, the episodes in these linkages comprised 32 percent of all the episodes in his day.

The percents in Table 4 for the Midwest children range from 3 to 41, with a median of 31. These values show a rank correlation with

Table 3  
Percent of Linkages at Each of  
Four Levels of Episode Overlapping

Child	Single	Dual	Triple	Quadruple
Mary G.	72	26	2	0
Jimmy	79	20	1	0
Lewis	69	26	5	0
Dutton	67	29	4	0
Margaret	63	32	5	0
Maud	65	28	6	1
Roy	62	30	7	1
Ben	71	22	6	1
Ray	66	29	5	0
Mary E.	66	29	4	1
Douglas	57	36	7	0
Claire	60	33	6	1
Wally	67	28	4	1
Sue	57	32	9	2
Bobby	56	37	5	2
Verne	68	26	5	1

age of .61, significant beyond the 1 percent level. There is no evidence in these data that disabled children cannot have as many complex linkages of episodes as normal children.

The triple and quadruple levels of episode overlapping represent the most complex behavior structure in our records. That the proportion of episodes in complex patterns of interconnected behavior units should increase with age is not surprising in view of findings from psychological tests and experiments which have demonstrated increase with development

Table 4

Percent of Episodes Occurring Within Linkages  
at Triple and Quadruple Levels of Overlapping

Child	Percent of Episodes	Child	Percent of Episodes
Mary C.	8	Roy	34
Jimmy	3	Ben	32
Lewis	21	Ray	31
Dutton	22	Mary E.	32
Margaret	26	Douglas	32
Maud	36	Claire	41
Wally	23	Bobby	30
Sue	49	Verne	32

in the complexity of numerous psychological processes. Our findings, however, add to other evidence that children in their everyday lives not only can, but do, engage in more complex behavior as they grow older.

Number and Duration of Episodes

Table 5 presents, for episodes, data comparable to those shown in Table 2 for linkages. The actual number of episodes in each record is given in Column 1. Just as with linkages, the original number of episodes is not directly comparable from record to record owing to differences between the children in length of day. Consequently, these figures were adjusted by a formula analogous to that used with the number of linkages. The adjusted figures are shown in Column 2.

It will be seen that the actual number of episodes for the Midwest children ranges from a low of 494, for Claire, to 1335, for Lewis, with a median of 1013; when length of day is reduced to the shortest day (11 hours, 8 minutes), the range is from 383 to 1335. These figures for Claire and Lewis represent a striking difference in the behavioral partitioning of the two days. Claire's day was made up of a relatively small number of large parts. Several of Claire's episodes lasted as long as 50 minutes, one of them 2 hours. Lewis, on the other hand, engaged in few long episodes. His day consisted of many small parts. Comparisons of other older and younger children reveal similar differences.

The age relationship suggested by inspection of these data is borne out by a rank correlation coefficient of  $-.61$ , significant beyond the 1 percent level. Column 3 presents the same results in different terms. These figures were obtained by dividing the total number of minutes in the day by the actual number of episodes for each child. The age relationship for Column 3 is, of course, identical with that of Column 2

Table 5

## Number and Average Duration of Episodes

Child	Age	Col. 1	Col. 2	Col. 3
		Actual No. of Episodes	Adj. No. of Episodes*	Average Duration (minutes)
Mary C.	1-10	1103	1036	0.64
Jimmy	1-11	1027	1022	0.65
Lewis	2-11	1335	1335	0.50
Dutton	3-10	1159	1004	0.66
Margaret	4-6	1059	885	0.75
Maud	5-0	1196	1178	0.57
Roy	6-2	699	579	1.15
Ben	7-4	675	603	1.11
Ray	7-4	1000	821	0.81
Mary E.	8-7	969	746	0.89
Douglas	9-2	940	735	0.91
Claire	10-9	494	383	1.74
Wally	4-3	907	887	0.75
Sue	7-1	771	629	1.01
Bobby	7-4	683	587	1.14
Verne	7-5	977	759	0.88

\* Adjusted for differences between children in length of day.

with the sign reversed. A finding of fewer episodes and episodes of longer duration as age increases is clearly established for these children.

From inspection of Table 5, it is apparent that the four disabled children do not differ significantly from the Midwest children in differentiation of their days into episodes. On a plot to show relationship with age, the curves for the two groups are scarcely distinguishable.

#### Length of Episodes

Beginning with Table 6, all reported results are based not upon the entire record on each subject, but upon the sample consisting of about one half of the episodes in each record.

Looking first, in Table 6, at the overall distribution of the percents of episodes with different temporal durations, perhaps the outstanding finding is that, with every child, more than 70 percent of the episodes lasted less than two minutes. The number of episodes lasting 2 or more minutes totals no more than 26 percent in any case, and, in one, amounts to less than 8 percent. These findings are consistent with those in Table 3 on average duration of the total number of episodes in each record. We have noted that the mean duration ranged from half a minute to a minute and three quarters. These data can be said to show that, on the average, the children set out toward a new goal once every 45 seconds. Table 6 shows that this average is heavily weighted by many very short episodes and that relatively few of the episodes lasted more than five minutes.

The two rows immediately below the data for the Midwest children record rank correlations with age, together with significance measures. The

coefficients show that correlation between age and length of episode is significantly negative for the shortest episodes, and gradually shifts to positive for longer episodes until it reaches a highly significant positive value with the longest episodes. Change from a negative to a positive correlation occurs between the time intervals of 30 seconds and one minute. The generally prevailing reversal was implied earlier by figures on average episode duration for each record; but the point at which the shift occurs is shown here. So also are relatively high correlations with age for the very short episodes at one extreme and the longest episodes at the other. Again there is no evidence that the disabled children differed from the Midwest children.

These data on the number and duration of episodes are basic data on the partitioning of behavior in naturally occurring situations. They show that the children of Midwest did from about 500 to about 1300 "things" in a day, that the average duration of these commonly discriminated units of action was from half a minute to one and three-quarters minutes, that the number of episodes was negatively correlated with age, that the duration of episodes was positively correlated with age, and that there was no suggestion of evidence that the disabled children differed from the normal children in these respects.

#### Frequency and Complexity of Overlapping

Data on episode overlapping are presented in Tables 7 through 11. They supplement and refine some of the information from analysis of linkages.

Table 6

Percent of Episodes with Stated Length

Child	Age	N	$\frac{1}{4}$ m	$\frac{1}{2}$ m	1 m	2 m	3 m	4-5 m	6-10 m	11 m or more
MC	1-10	615	50	20	21	4	2	1	1	+
JS	1-11	490	54	22	18	4	1	1	1	+
LH	2-11	653	53	20	17	6	1	1	1	+
DT	3-10	633	58	19	12	4	2	2	2	+
MR	4-6	582	39	33	18	4	2	2	1	2
MP	5-0	607	51	21	18	5	2	1	1	1
RE	6-2	326	29	22	31	8	3	2	2	3
BH	7-4	358	32	23	25	9	4	1	3	2
RB	7-4	511	42	18	24	9	2	2	2	1
ME	8-7	545	41	18	27	5	2	3	2	2
DC	9-2	422	42	20	22	7	2	2	1	3
CG	10-9	233	27	20	28	11	4	4	3	4
Age vs. Column: Tau A			-.45	-.21	.48	.54	.44	.62	.59	.74
Significance Level			.05	.37	.04	.02	.06	.01	.01	.001
WW	4-3	499	45	18	25	5	3	2	2	1
SD	7-1	423	40	21	26	4	2	2	2	3
BB	7-4	337	30	20	30	9	3	3	3	2
VT	7-5	513	36	24	27	5	2	2	2	2

To what extent did overlapping of episodes occur in these recorded days? Table 7 answers this question in terms of the percent of all episodes in each record which were found to overlap with one or more other episodes. The table shows that, of the Midwest children, Jimmy behaved in the smallest, and Douglas the largest, proportion of overlapping episodes, as indicated by percents of 51 and 83 respectively. The median percent of overlapping episodes is 73. A relationship

Table 7  
Percent of Episodes Which  
are Overlapping

Child	Percent of Episodes	Child	Percent of Episodes
Mary C.	53	Roy	77
Jimmy	51	Ben	75
Lewis	67	Ray	63
Dutton	64	Mary E.	76
Margaret	75	Douglas	83
Maud	71	Claire	78
Wally	66	Bobby	80
Sue	89	Verne	74

between amount of overlapping and age is demonstrated by a rank correlation coefficient of .61, significant beyond the 1 percent level. It appears, then, that only about one-fourth, and never more than one-half, of the episodes in the days of these children occurred in

isolation. For the most part, the children did not do one thing at a time, they were involved during a greater part of their time in multiple-track action. In general, moreover, this was true more frequently of the older than of the younger children.

Although Sue, one of the disabled children, has the highest percentage of overlapping episodes, the four disabled children as a group do not appear to differ greatly from the Midwest children on this variable. The relatively high percent for Sue may be a function of the ubiquity of social behavior objects in her life situation. From the descriptions of these children in the appendix, it may be noted that Sue spent her entire day at the Lawton school where solitude was not often possible.

Overlapping episodes differ with respect to the number of episodes that overlap with them. This difference has been measured in two ways. We have determined for each overlapping episode, first, the total number of other episodes which overlap with it throughout its course and, second, the largest number of episodes which overlap with it at any one time during its course (see categories 2 and 3, above). Results of these analyses are shown in Tables 8 and 9. Since the base for the percents in these tables is the number of overlapping episodes, the N column values are not the same as in preceding tables.

The overall pattern of the data in Table 8 shows that most of the episodes overlap with only one other episode. Those overlapping with more than one episode total no more than 30 percent for any child.

There is no significant relationship between these percents and age except for the greater-than-5 column which yields a rank correlation coefficient of .50, significant at the 3 percent level. In view of the

Table 8

Percent of Overlapping Episodes Which Have  
Stated Number of Other Episodes Overlapping  
With Them

Child	N	Number of Episodes					
		1	2	3	4	5	>5
Mary C.	327	83	10	2	1	2	2
Jimmy	250	88	6	2	1	+	2
Lewis	437	73	15	5	3	1	3
Dutton	406	83	10	2	1	+	3
Margaret	439	82	10	2	2	+	4
Maud	432	75	17	3	1	1	3
Roy	252	82	8	3	0	+	6
Ben	267	73	16	2	2	1	5
Ray	322	80	11	3	1	1	4
Mary E.	415	82	9	2	+	2	4
Douglas	351	75	16	2	1	1	5
Claire	182	79	12	3	3	0	4
Wally	331	80	12	2	2	1	4
Sue	375	82	11	1	+	+	5
Bobby	269	83	9	1	1	2	5
Verne	379	84	8	2	1	2	4

earlier findings to the effect that the older children had longer episodes and showed more overlapping in linkages, it is not surprising to find more occurrences of complex overlapping of their episodes.

Table 9, as mentioned above, shows for each child the percent of overlapping episodes which have a stated maximum number of other episodes overlapping with them at any one time.

The data show that simultaneous overlapping with the target episode is for the most part limited to one other unit in these records. Simultaneous overlapping of two or more episodes with the target unit accounted for percents of overlapping episodes ranging from a low of 1, in the Jimmy Sexton record, to a high of 21, in the Ben Hutchings record, with a median of 9. These percents are somewhat higher for the older than for the younger children. A rank correlation of .38 suggests relationship in the expected direction, but the significance of this coefficient is doubtful ( $P = .10$ ).

There is no evidence to suggest that the disabled children differ from the nondisabled with respect to overlapping.

It may be noted that this analysis of episodes is similar to that of linkages, represented above in Table 2. Both analyses deal with overlap phenomena. While the data in Table 9 are generally consistent with those in Table 2, there are differences which require explanation. Most notably, relationships with age are more significant for linkages than for episodes. One factor tending to produce differences between these sets of results is the way in which discontinuity was handled. For the analysis of linkages, interpolated episodes, i.e., episodes occurring between segments of a discontinuous episode, were counted as overlapping, whereas this did not hold for the episode analysis. Thus, some episodes

Table 9

Percent of Overlapping Episodes Which Have  
Stated Maximum Number of Other Simultaneously  
Overlapping Episodes

Child	N	Number of Episodes		
		1	2	3
Mary C.	327	95	5	0
Jimmy	250	99	1	0
Lewis	437	84	16	0
Dutton	406	96	4	0
Margaret	439	91	9	0
Maud	432	82	18	0
Roy	252	91	9	0
Ben	267	79	20	2
Ray	322	91	9	0
Mary E.	415	91	9	0
Douglas	351	83	17	0
Claire	182	87	13	0
Wally	331	82	11	0
Sue	375	90	10	0
Bobby	269	90	10	0
Verne	379	93	7	0

classified as isolated in the episode analysis were counted as instances of dual overlapping in the linkage analysis. It will be shown later (see p. 72) that the number of interpolated episodes is larger for older children. Another factor in this difference is that the percents in the two tables are computed from different bases. All episodes in each record enter Table 2 but only the overlapping episodes in the sample enter Table 9; it has been shown that the ratio of overlapping episodes to total number of episodes varies from child to child (see Table 7).

#### Type of Overlap

Overlapping episodes differ with respect to their interpositional relations. This is the variable we have attempted to measure by means of category 4, Type of Overlap. Results from classification of overlapping episodes according to this category are given in Table 10. The table shows that, for every child, most of the overlapping episodes were of the enclosed type. These and enclosing episodes account for about 90 percent of the overlapping in the 16 day records. Interlinking episodes are relatively rare; and all combinations of differing types of overlap taken together total no more than 11 percent of the overlapping units in any case.

The almost total lack of coinciding episodes, i.e., episodes which both begin and end simultaneously, probably reflects an interpretational bias on the part of the episoders toward combining into a single unit discriminable activities which, from another point of view, could be treated as separate episodes. Consider, for example, 7-year-old Wilma, who walks to school in the morning with her friend, Norah. As the

Table 10  
 Percent of Overlapping Episodes of  
 Stated Type

Child	N	Coin- ciding	Enclosing	Enclosed	Inter- linking	Combinations
Mary C.	327	0	27	65	4	4
Jimmy	250	0	28	70	0	2
Lewis	437	0	20	68	3	9
Dutton	406	4	23	69	4	4
Margaret	439	0	15	78	1	5
Maud	432	0	19	70	3	8
Roy	252	0	16	77	2	5
Ben	267	0	13	73	3	11
Ray	322	0	25	68	2	4
Mary E.	415	0	17	78	1	4
Douglas	351	0	15	78	1	6
Claire	182	0	16	77	2	5
Wally	331	0	18	73	1	10
Sue	375	0	10	85	1	3
Bobby	269	0	17	78	1	3
Verne	379	0	14	81	2	3

episodes saw this behavior, it would be one action, a single episode, Walking to School with Norah, in which the activity of being with Norah was merely a social part of the total situation. However, it can be argued that the being with Norah is an activity which has independence and significance as something to be done, no less than the activity of going to school, and that these are really separate, although coterminous activities, corresponding to separate, independent goals. Whatever the merits of these alternative interpretations of such behavior, our decision in favor of the former is reflected in the near absence of coinciding overlap. However, it must also be considered here that the episodes noted only rarely instances of possible coinciding overlap comparable to the one just cited.

The data from twelve Midwest children indicate that the frequency of occurrence of both enclosing and enclosed episodes is correlated with age. Rank order coefficients for these two types of overlapping respectively are  $-.45$  and  $.52$ , with corresponding significance levels of  $.05$  and  $.03$ . These findings, taken together, give further evidence that the behavior of the older children occurred in units of longer duration, and that the older children managed to maintain goal directed actions with greater persistence in the face of potentially interrupting action units. The findings are consistent with those reported above on number and duration of episodes and linkages. No evidence was found that the disabled children differed from the nondisabled.

#### Form of Interepisode Transition

Results from category 5, Form of Transition, are shown in Table 11. The percents in this table are based upon the total number of episodes in

the respective samples, not only the overlapping episodes, as in the immediately preceding tables. These data are not entirely independent of other results presented above, nor are they duplicative. They represent a somewhat different approach to the general problem of describing the structural interrelationships of episodes.

Table 11 shows that the different transition forms occur with varying frequencies in the behavior of different children. In Jimmy Sexton's record, over 67 percent of the episodes were characterized by abrupt termination, while only about 33 percent were characterized by merging transitions, i.e., were linked by overlapping with a continuing episode. With the older children in general, these percents are reversed. For example, they are 37 and 63 respectively for Claire. The median percent of merging transitions for the Midwest children is 55. A rank correlation of .64 ( $P = .01$ ) was obtained between age and percent of episodes marked by merging transition. These data substantiate earlier evidence that the behavior of the older children was less broken or saltatory than that of the younger children. The younger children tended to do things sequentially, one at a time; the actions of the older children were more interlaced. There is no consistent pattern of difference between the disabled and the nondisabled children.

#### Continuity and Interpolation

The final results on structural characteristics of behavior are given in Tables 12 and 13 which show data on the continuity of episode course and on the incidence of interpolated episodes, i.e., episodes occurring between segments of discontinuous units. From Table 12 it is

Table 11

Percent of Episodes with Stated Form  
of Transition at Point of Termination

Child	N	Abrupt	Merging
Mary C.	615	66	34
Jimmy	490	67	33
Lewis	653	54	46
Dutton	633	55	45
Margaret	582	40	60
Maud	607	48	52
Roy	326	38	62
Ben	358	42	58
Ray	511	56	44
Mary E.	545	38	62
Douglas	422	34	66
Claire	233	37	63
Wally	499	48	52
Sue	423	24	76
Bobby	337	38	62
Verne	513	39	61

apparent that discontinuous episodes comprise a very small proportion of the total number; the largest value in the table is 3 percent for Bobby Bryant. There is no correlation between age and the percents in the table.

Table 12

Percent of Episodes  
Which are Discontinuous

Child	Percent of Episodes	Child	Percent of Episodes
Mary C.	1	Roy	2
Jimmy	1	Ben	1
Lewis	2	Ray	2
Dutton	2	Mary E.	2
Margaret	2	Douglas	2
Maud	2	Claire	4
Wally	1	Bobby	3
Sue	2	Verne	2

The data in Table 13 on percent of interpolated episodes suggest some correlation with age, as indicated by a rank correlation coefficient of .42, with a P of .07. Thus, there is indication that, while the proportion of discontinuous episodes remains roughly constant from record to record, the proportion of units interpolated between the different segments of these discontinuous episodes tends to be somewhat larger for the older children. This finding could be taken to

suggest manifestation under naturally occurring conditions of an increase with age in ability to sustain need tension corresponding to an incomplete action.

The findings in Tables 12 and 13 on the disabled children differ little from those on the nondisabled. A weak tendency is apparent in Table 13 toward more interpolated episodes for the disabled children than for their nondisabled age-mates. Bobby Bryant had more interpolated episodes than even the oldest nondisabled child. A possible psychological correlate of peripheral motor disability suggested here is an

Table 13

Percent of Episodes  
Which are Interpolated

Child	Percent of Episodes	Child	Percent of Episodes
Mary C.	1	Roy	9
Jimmy	1	Ben	2
Lewis	3	Ray	5
Dutton	7	Mary E.	8
Margaret	4	Douglas	2
Maud	7	Claire	8
Wally	4	Bobby	12
Sue	6	Verne	7

increased ability to maintain tension toward the goal of an incomplete action through a number of interpolated episodes.

## Conditions Related to Behavior Structure

Turning now from purely structural characteristics of behavior, some related factors and conditions will be considered.

### Actone Interference

Table 14 presents data on interference between actones implementing the actions in every two-unit overlap which occurred in the sample from each record. It is emphasized that the N upon which the percents of Table 14 are based is neither the number of episodes in the sample nor the number of overlapping episodes, but the number of pair relationships between simultaneously overlapping units.

Previously reported data show that these children did two or more things at a time in one-half to three-fourths of the episodes and that the younger children complicated their lives in this way less frequently than the older children. The present results tell us something about how this overlapping is accomplished.

Table 14 indicates that, for most of the children, overlapping was accomplished most frequently by utilizing partly the same actones in the two episodes, as when Ray Birch, while riding his bike to school, glanced back to see whether the observer was keeping up with him. For the Midwest children, the percents of cases involving partly same actones range from 22 to 60 with a median of 44.

When the actones specific to the two episodes occur simultaneously, they are characteristically different, as when the child is Eating Supper and Listening to Conversation. The simultaneous occurrence of different actones accounts for between 25 and 56 percent of the cases of two-

Table 14

Percent of Two-Episode Relationships with Stated Type of Actone Interference

Child	N	Simul- taneous Same 1	Simul- taneous Different 2	Partly Same 3a	Alter- nating Different 3b	Alter- nating Same 4	CNJ
MC	198	2	44	46	7	1	+
JS	164	1	34	55	8	2	0
LH	326	2	46	35	13	1	3
DT	266	4	25	60	8	2	+
MR	364	3	34	22	39	2	1
MP	328	1	51	27	15	6	+
RE	196	2	42	48	5	1	2
BH	219	+	29	37	30	+	4
RB	234	2	31	55	10	1	1
ME	319	2	35	52	10	0	1
DC	303	+	41	42	14	1	2
CG	129	0	56	41	2	0	1
WW	240	2	36	44	12	4	1
SD	318	2	42	50	3	1	1
BB	230	1	56	18	20	3	2
VT	309	2	38	47	8	2	3

episode overlap; the median percent is 38. Simultaneous occurrence of the same actones was rare in these records, totaling no more than 4 percent in any case.

When the actones specific to the two episodes occur in alternation, they generally are different and only rarely are the same. The percents of cases involving the alternating occurrence of different actones range from 2 to 39 with a median of 10 while the alternating occurrence of the same actones accounts for no more than 6 percent of the cases in any record.

Considering the data in Table 14 in terms of the interference continuum described earlier, the distribution of the median values is highest at the point of medium interference and that it takes a form which, although approximately normal, is noticeably skewed toward the low end of the interference continuum. From these data it would appear, then, that when overlapping occurs, the actone manifolds mediating the two episodes are, in general, neither highly congruent nor seriously interfering; rather, the degree of interference between the two sets of actones is usually either medium or between medium and low.

There appears to be no relation between the data of Table 14 and age. Neither do the results on the disabled children differ in any consistent way from those on the nondisabled children.

#### Incidence of Contained Episodes

Table 15 shows the incidence of contained episodes in each record, expressed as the percent of the number of overlapping episodes. For the Midwest children these percents range from a low of 4 for Margaret and Ray to 14 for Claire with a median value of 8. There is no correlation

between these data and age. Among the four disabled children, the range is as great as that for the Midwest children, i.e., 2 to 12. These results are important to a study of behavior structure because contained episodes constitute a special source of overlapping. Each episode contributing to the percentages in Table 15 is a part of a larger, unidirectional unit from which the part is segregated solely on the basis of its high relative potency. The data of Table 15 indicate that the

Table 15  
Percent of Overlapping Episodes  
Which are Contained

Child	Percent of Episodes	Child	Percent of Episodes
Mary G.	10	Roy	7
Jimmy	6	Ben	10
Lewis	9	Ray	4
Dutton	9	Mary E.	7
Margaret	4	Douglas	7
Maud	9	Claire	14
Wally	12	Bobby	2
Sue	8	Verne	6

frequency with which parts of episodes become so segregated varies from child to child. It may be that equal or even greater variation occurs for the same child in different situations. An adequate accounting for these variations could be made only by a special investigation.

Relative Weight

Table 16 gives the results from classifying overlapping episodes according to relative weight. These data show that between 65 percent and 85 percent of the overlapping episodes were of primary weight for at least a part of their duration. Or, conversely, only 15 to 35 percent of the overlapping episodes never reached a rank order potency higher than secondary. Episodes which were never less than primary, tied total between 55 and 72 percent of the overlapping units. There are no significant relationships here with age, nor do there appear to be group differences between the disabled and the nondisabled children.

Episode Initiation

Table 17 gives data on episode initiation. The results for the Midwest children form a clear pattern. For all but two children the percent of spontaneous starts is greater than the percent of instigated starts which is, in every case, much greater than the percent of pressured starts. Ignoring the size of the differences, it is possible to measure the consistency of this highest, next highest, and lowest pattern for spontaneous, instigated, and pressured starts respectively among these twelve children by Kendall's coefficient of concordance,  $W$  (10, p. 81). This coefficient for the Midwest children was found to be .862, significant well beyond the 1 percent level. This statistic indicates that the consistency of the initiation pattern among these children is greater than could be expected on the basis of chance alone. The data show that observable instigation from without operated in a lesser degree than spontaneous initiation of episodes in the days of these children.

Table 16

Percent of Overlapping Episodes  
With Stated Relative Weight

	Relative Weight							
	1	1'	2	3	1,2	1,3	2,3	1,2,3
Child	1	1'	2	3	1,2	1,3	2,3	1,2,3
Mary C.	41	19	20	1	18	0	0	1
Jimmy	51	12	21	0	16	0	0	+
Lewis	37	18	23	1	17	+	0	3
Dutton	22	42	27	1	8	0	0	+
Margaret	45	27	15	+	10	0	0	2
Maud	40	28	14	1	13	+	0	3
Roy	39	21	24	1	12	0	+	2
Ben	29	35	18	1	12	1	+	3
Ray	22	37	31	2	7	+	0	+
Mary E.	33	23	35	1	7	+	+	1
Douglas	34	37	17	1	8	0	+	3
Claire	42	19	23	+	12	+	0	3
Wally	37	25	26	1	9	0	0	2
Sue	45	20	27	+	6	0	0	2
Bobby	27	38	24	2	7	+	0	2
Verne	42	22	25	+	10	0	0	2

Table 17  
 Percent of Episodes with Stated  
 Type of Initiation

Child	Spontaneous	Instigated	Pressured	Can Not Judge
Mary C.	59	35	5	1
Jimmy	58	40	2	1
Lewis	62	35	2	1
Dutton	62	34	4	1
Margaret	49	43	8	1
Maud	56	42	2	1
Roy	49	45	1	6
Ben	40	50	7	3
Ray	56	40	3	1
Mary E.	53	42	3	2
Douglas	60	34	3	1
Claire	42	54	0	5
Wally	50	47	2	2
Sue	45	54	1	1
Bobby	36	63	1	1
Verne	44	53	2	1

There is a weak negative relationship between age and percent of spontaneously initiated episodes, as shown by a rank correlation coefficient of  $-.33$ . Although it does not meet customary standards of significance ( $P = .16$ ), this coefficient suggests greater spontaneity in the initiation of action units among the younger children. It does not follow, however, that this is necessarily a function of age per se. It has been shown elsewhere (3) that children of different ages enter different behavior settings and that different behavior settings require different kinds of behavior. One possibility is that many behavior settings entered by the older children, e. g., school settings, organized group meetings, are more directly coercive with regard to particular molar actions than are the settings in which the younger children spend much of their time, e.g., Home Indoors. An analysis of episode initiation in different behavior settings might very well produce more definitive trends than those suggested in the present data.

The data in Table 17 on the disabled children provide an interesting contrast with the data on the Midwest children; the pattern mentioned above is partially reversed in that, for three of the four disabled children, the percent of instigated starts exceeds the percent of spontaneous starts. The coefficient of concordance,  $W$ , for this pattern is  $.813$ , significant at the 5 percent level, which means that its consistency among the children is greater than chance allows. Thus we see that the Midwest children tended to have consistently higher percents of spontaneous starts and the disabled children tended to have consistently higher percents of instigated starts.

In interpreting this reversal, differences in behavior settings again seem important. Sue Dewall spent her entire day, and Verne Trenell spent a large part of his day, in the Lawton school where individual freedom was necessarily limited by group routines. Bobby Bryant, who has the highest percent of instigated starts, was constantly surrounded by solicitous associates.

#### Episode Issue

Table 18 shows the results on category 11, Issue of Episode. In accordance with the original itemization of the category, issues are grouped in the table according to whether the episode was judged to be complete or incomplete.

In view of the results of the agreement tests on this category perhaps the most dependable finding is the one on completeness of episodes. Complete units make up between 72 and 83 percent of all episodes for the Midwest children with a median of 76 percent. The percents of incomplete episodes range from 4 to 17 with a median of 11. The data indicate, further, a negative relationship between age and percent of incomplete episodes, shown by a rank correlation coefficient of  $-.74$ , significant well beyond the 1 percent level. These data indicate, therefore, that all of the children usually finished things they started, but that the younger children stopped short of the goal more frequently than the older children.

A somewhat surprising result shown in Table 18 is the low frequency of occurrence of success, frustration, and failure. Summing the percents for these three issues for each of the children, the resulting values range from less than 1 percent to 7 percent with a median of 2 percent.

Table 18

## Percent of Episodes with Stated Issue

## Issue of Complete Episodes

Child	Acquit- tance	Attain- ment	Gratifi- cation	Suc- cess	Consum. Sat'd	Other	Total Completed Episodes	Can Not Judge
MC	9	8	2	2	4	49	74	10
JS	10	8	1	2	8	44	73	12
LH	11	7	3	1	3	56	80	9
DT	18	9	4	4	6	32	72	12
MR	12	10	2	1	2	47	74	10
MP	8	4	1	+	2	63	78	10
RE	10	5	2	2	2	52	74	15
BH	11	8	2	1	2	49	73	16
RB	16	15	2	2	7	40	81	10
ME	14	5	1	2	3	60	83	10
DC	12	6	+	+	2	58	79	12
CG	13	3	3	+	+	61	81	15
WW	12	5	1	1	3	49	71	10
SD	20	3	4	1	+	51	78	11
BB	13	4	2	1	3	63	86	9
VT	11	2	2	1	1	60	76	9

## Issue of Incomplete Episodes

Child	Nonattain- ment	Frustra- tion	Failure	Cons. Not Sat'd	Other	Total Incomplete
MC	2	3	+	6	6	17
JS	2	0	0	5	7	14
LH	1	1	0	4	5	11
DT	5	3	+	5	1	12
MR	5	2	0	5	3	15
MP	1	+	0	3	6	11
RE	1	1	0	6	3	11
BH	8	1	0	2	+	11
RB	1	2	+	4	2	9
ME	+	0	+	3	3	6
DC	1	+	0	3	5	9
CG	+	0	0	2	1	4
WW	2	+	0	8	8	18
SD	1	0	0	5	4	10
BB	2	0	0	1	2	5
VT	+	1	+	5	9	15

Life for these children appears to have been less a matter of high ups and low downs than one might be led to expect from the amount of attention often given to these outcomes of action in research and writings on children's behavior.

It is interesting to compare the percents of "good" outcomes, i.e., attainment, gratification, and success, with the percents of "bad" outcomes, i.e., nonattainment, frustration, and failure. For every child, the percent of good outcomes or endings is higher than the percent of bad endings; for the Midwest children, the median percents are 11 and 2, respectively. While the differences between the percents of good and bad endings are not great (median difference = 7 percent), the consistency of this relation from child to child is striking.

Both good and bad endings show weak negative correlations with age. The rank correlation coefficient between age and percent good endings is  $-.36$  ( $P = .11$ ) and is  $-.42$  ( $P = .07$ ) for bad endings. Note that the decrease with age is slightly more pronounced for bad than for good endings.

A somewhat similar trend is apparent in the data on consummatory episodes. The rank correlation coefficient between age and percent consummatory episodes is  $-.45$ , significant at the 5 percent level. Considering the nonsatiated consummation issues alone, the rank correlation with age is  $-.53$ , significant at the 2 percent level. Activity valued as an end in itself evidently declined with age.

Finally, we note the relatively high frequency of occurrence of the issue, acquittance. This issue is checked, it may be recalled, for very short and unimportant episodes. The table shows that acquittance issues

account for between 8 and 18 percent of all episodes. This would indicate that a sizeable portion of the episodes in these records consists of units best described as brief distractions from the main course of events.

Once again there is no suggestion of difference between the disabled and the nondisabled children. It is noted especially that these data offer no evidence to support a contention that motor disability necessarily implies more frequent occurrence of bad episode endings.

#### Episode Termination

Table 19 presents findings on episode termination. The overall pattern shown by these data is even more consistent than that for the data on episode initiation. For every child the rank order is the same, viz., spontaneous, environmental cessation, instigated, and pressured in order of mention. Thus for the Midwest children, this pattern yields a coefficient of concordance,  $W$ , of 1.0. Although this coefficient leaves out of account the size of the differences between the four possible kinds of termination, the table shows large differences between columns. These findings, together with those reported above on episode initiation, indicate that these children displayed marked independence in starting and stopping their action units; they were not often forced to start or stop their activities.

In general, the data for the disabled children follow the pattern of those for the Midwest children, i.e., the percents have the same rank order. The disabled children, however, have somewhat lower percents of spontaneous and pressured terminations than the Midwest children. This trend is in the same direction as that noted above for episode initiation,

Table 19

Percent of Episodes With  
Stated Type of Termination

Child	Spontaneous	Environmental			Can Not Judge
		Instigated	Cessation	Pressured	
Mary C.	62	11	18	6	4
Jimmy	62	11	22	2	2
Lewis	65	8	19	4	4
Dutton	65	10	16	3	6
Margaret	57	11	21	6	5
Maud	62	11	18	4	6
Roy	51	11	26	2	10
Ben	59	10	21	4	7
Ray	67	8	19	1	5
Mary E.	66	5	22	2	6
Douglas	63	9	17	5	6
Claire	59	6	23	0	12
Wally	54	14	24	2	6
Sue	55	8	26	1	10
Bobby	56	9	29	1	6
Verne	52	13	27	2	6

but here the difference is less clear cut. The two sets of data suggest, however, that behavior structure was determined more by external forces among the disabled children.

### Summary of Results and Conclusions

The larger significance of the data on behavior structure is necessarily limited at the present time because other facts about the structure of naturally occurring behavior are not known and because current theories do not focus on behavior structure. However, suggestions arising out of the data are presented below together with a summary of the main findings of the study.

### Reliability of Structure Analysis

Perhaps the most important single result of the study is the demonstration that the stream of behavior has characteristics which can be reliably described in terms of behavior structure, as here defined. The evidence supporting this conclusion is of three kinds, namely, (1) the degree of agreement with which records can be episoded, (2) the degree of agreement with which descriptive categories can be applied to episodes by independent workers, and (3) the internal consistency of different aspects of the structure data.

The results of the episodizing agreement tests (see pages 16-19) range from 72 to 92 percent identification of the estimated true number of episodes by both of two independent episodizers. This means that the behavior of children, as reported in the specimen records used in the study, displays structural characteristics of sufficient clarity to permit quite highly consistent discrimination of episodes as units of behavior structure.

Systematic agreement tests were made for four of the twelve descriptive categories (categories 7, 10, 11, and 12). In these tests, independent analysts made identical judgments upon 59 to 91 percent of the episodes. The lowest of the agreements indicates that this judgment was made with only low assurance that another analyst would agree upon the judgment of a particular episode. Nevertheless, even this degree of agreement allows the category to be used in some kinds of analysis. Indirect evidence that five of the categories (categories 2, 3, 4, 5, and 6) had sufficient reliability for our purposes was available. This evidence was afforded by the satisfactory results of the episoding reliability tests inasmuch as each of these categories deals with an aspect of behavior structure identified in the episoding process. Three categories (categories 1, 8, and 9) were used despite the absence of reliability data.

#### General Characteristics of Behavior Structure

Our data show that the Midwest children did about 1,000 "things," on the average, in one day. These episodes of behavior generally lasted less than one minute, although they ranged in length from a few seconds to two hours. Clusters of interconnected episodes, called linkages, usually numbered about 400 per recorded day, lasted about two minutes, and included an average of two episodes.

One-half to three-quarters of the episodes were involved in some kind of overlapping with one or more other episodes. This is to say that the children very often did more than one thing at a time. However, the number of action units which occurred at one time was sharply limited; only about ten percent of the overlapping episodes had more than one other

episode overlapping with them. Most of the overlapping episodes occurred as units intervening between the beginning and ending of a longer episode. More than half of all episodes ended by merging structurally into the subsequent unit.

The incidence of discontinuous episodes, i.e., episodes which were started, abandoned, and later resumed, was low; such episodes made up no more than 2 percent of those in any of the day records on Midwest children. Interpolated episodes, i.e., units occurring between segments of discontinuous episodes, also were infrequent, totaling 4 to 6 percent of all episodes in the record.

As noted above, the children did two or more things simultaneously in one-half to three-quarters of the episodes. For most of the children, this was usually accomplished by using some of the same actones in both episodes as well as some actones that were unique to a particular overlapping unit. Often, however, overlapping was effected by the simultaneous employment of actones unique to each of the overlapping units. In general, when overlapping occurred, the actone manifolds mediating the two episodes were neither highly congruent nor seriously interfering.

While most of the episodes in each record were identified on the basis of their directional properties, some were discriminated solely on the basis of their high potency. These so-called contained episodes made up between 4 and 14 percent of the episodes in each record.

Few of the episodes in these records were initiated in response to direct pressure on the child. Most of them started with apparent spontaneity, while others, about one-third to one-half of the total per day, were initiated in response to observable change in the child's situation other than direct pressure.

These children ultimately completed during the course of the day more than 70 percent of the things they started. Incomplete episodes, i.e., those in which the child did not reach his objective, comprised less than 20 percent of the episodes in every record. For every child, the percent of episodes having "good" endings or issues (attainment, gratification, or success) was higher than the percent having "bad" endings (nonattainment, frustration, or failure). The difference in favor of "good" endings was usually about 7 percent. These data on episode completeness and issue suggest that the Midwest culture provided psychologically satisfying situations for children. Perhaps most students of child behavior would agree that situations which enable the child to complete most of the things he starts and in which the proportion of "good" endings exceeds the proportion of "bad" ones are likely to favor healthy psychological development.

The data show that most of the episodes terminated spontaneously. These children were not often subjected to pressure to cease an activity, but episode termination in response to other kinds of external change was quite common. Taken together, the results on episode initiation and termination indicate that the children displayed marked independence in starting and stopping action units; they were not often forced to start or stop. These findings throw some additional light upon the nature of the psychological living conditions which children found in Midwest. Like results on episode initiation and termination would seem improbable in a highly restrictive culture. It would appear that flexibility and freedom in at least some aspects of behavior were characteristic of the stage upon which these children played their roles.

Relationships Between Structure Variables and Age

Since the subjects of this study ranged in age from 2 to 10 years, it was possible to investigate relationships between behavior structure and age. The clearest of these relationships concern the number and duration of episodes and the complexity of behavior structure.

The younger children did more things in a day and their action units were, on the whole, shorter than those of the older children. These data on the partitioning of behavior in naturally occurring situations show that, for these children, the number of units (both episodes and linkages) was negatively correlated with age and that the average duration of units was positively correlated with age.

The complexity of the children's behavior structure increased with age. This is evidenced by the findings that the older children as compared with the younger showed

more episodes in each linkage;

more overlapping episodes;

more instances of 3 or more simultaneously overlapping episodes;

more instances of 5 or more sequentially overlapping episodes;

more episodes which ended by merging into the subsequent behavior unit;

more episodes interpolated between the segments of discontinuous episodes;

more completed episodes.

These findings appear to be mutually supporting. They produce an overall picture of marked differences in structural characteristics of behavior between younger and older children. The younger children tended to do things sequentially, one at a time, to shift frequently from

one action to another, and to persevere in a given activity a relatively short time, whereas the older children tended to engage in actions of longer duration, to pursue more than one action at a given time, and to carry to completion a higher proportion of their episodes.

The internal consistency of these findings, i.e., the fact that different indices of behavior complexity show the same trend toward greater complexity in the behavior of older children and that none of the findings are at odds with this trend, provides further evidence for the reliability of the present methods.

These data on relationships between behavior structure and age present points of affinity with certain theories of development.

In terms of the theory of development presented by Lewin (13, 14) and Kounin (12), which we will only review in outline here, the psychological person is structured into parts or regions which are coordinated to different behavior possibilities for the person. According to this theory, the degree of differentiation of the person increases with age. Thus an older person normally has more possibilities for action in a given situation than a younger one. The regions of the psychological person necessarily have boundaries. One postulated property of these boundaries is their rigidity, defined as the inverse of communication between neighboring regions of the person. Thus, the more rigid the boundary between two regions, the less a change in one affects neighboring regions. Further, the degree of rigidity of the person increases with chronological age. The psychological structure of the person is characterized, therefore, not only by a higher degree of differentiation into parts with increasing age but also by a higher degree of independence as between these parts.

The findings, reported above, that the older children had more long episodes and that they completed a higher proportion of the things they started than the younger children appear to be consistent with this theoretical formulation. The longer average duration and more frequent completion of episodes in the days of the older children could be conceived as a function of a higher degree of rigidity; for, since the theory provides that change in one region as a consequence of change in a neighboring region decreases with increase in rigidity, and rigidity increases with age, one can derive from this representation lesser susceptibility to distractions and diversions in the older children. Greater ability on the part of the older children to maintain simultaneously different courses of behavior, as shown by the increase with age in frequency of overlapping episodes, also can be derived from the greater rigidity of the boundaries which separate their need and ability systems.

Baldwin (2), in his description of the maturity continuum, holds that expansion of the psychological world is one of the major characteristics of the developmental process. One feature of this expansion, in Baldwin's formulation, is an increase with development in the temporal and spatial remoteness of objects with which the child is concerned. This means that the older child is to a lesser degree subject to the coerciveness of the immediate situation, the here and now, than is the younger child. One implication of this formulation, as far as behavior structure is concerned, might be that the older child, with his ability to relate himself to more remote objects, would have longer episodes and would show more persistence in reaching his goals than would a younger child. Such differences between the behavior structure of older and younger children were clearly demonstrated for the subjects of this study.

Comparison of Findings on Disabled and Nondisabled Children

One important and surprising finding of this study is that the behavior structure of the disabled children did not appear to differ appreciably from that of the physically normal children. Beyond the indication that the disabled children were less spontaneous in the initiation and termination of episodes, none of the variables measured in this study offered any suggestion of a real difference between the disabled and the nondisabled children as groups. This suggests that peripheral motor disability does not appreciably affect the structure of molar behavior, i.e., molar behavior structure would appear to be centrally determined.

## ABSTRACT

This is an investigation of the structure of children's molar behavior. Behavior structure refers to the anatomy or geometry of behavior as distinguished from its content. The study of behavior structure is the study of the partitioning of a behavior sequence into parts and the relations of part to whole and part to part within the behavior sequence without reference to what the parts contain. The source materials used in this investigation were day-long specimen records from the library of the Midwest Social Psychology Field Station. Twelve physically normal Midwest children and 4 physically disabled children of nearby communities were the subjects of these specimen records.

A method is described for dividing the behavior continuum into psychologically meaningful units called episodes. An episode is defined in terms of three basic attributes, viz., constancy in the direction of behavior, occurrence within the normal behavior perspective, and potency of the whole unit greater than potency of the parts. The structural characteristics of episodes and of their interrelationships were described in terms of 8 categories and certain other descriptive measures. These measures are concerned with such variables as total number of episodes in the day, length of episodes, and frequency and complexity of episode overlapping. Certain dynamic factors related to characteristics of behavior structure were described in terms of 4 other categories. Each of these descriptive procedures is defined and illustrated and results of reliability tests are reported.

The definitions and methods of this investigation yielded four kinds of results: (1) Reliability of structure analysis. Evidence of the reliability of the methods used in this study indicate clearly that behavior has structure which can be reliably described. (2) General characteristics of behavior structure. The basic data describing the structural properties of the behavior of the Midwest children provide a normative baseline of potential usefulness in comparative studies of other children in different cultural settings and at different times. (3) Relationships between structural variables and age. Since the subjects of this study ranged in age from 2 to 10 years, it was possible to investigate relationships between variables of behavior structure and differences in age. The most clear cut of these relationships concern the number and duration of behavior units and the complexity of behavior structure. (4) Comparison of disabled and nondisabled children. Although the number of disabled children studied is too small to permit definite conclusions, the comparative data do provide leads for later and more extensive studies.

## APPENDIX

### SUBJECTS OF THE SPECIMEN RECORDS

The following sketches from the files of the Midwest Social Psychology Field Station describe the children who served as subjects of day-long specimen records. Each sketch includes information about the child, his family, home, and friends. At the beginning of each sketch are listed the name, sex, and age of the child, the date of the study, and the hours of the day which were included. The 12 Midwest children are listed first followed by the 4 disabled children. Within each of these groups, the sketches are arranged in order of increasing chronological age.

SUBJECT: Mary Chaco (F, 1-10)  
TIME: October 10, 1950; 7:00 A.M.-9:45 P.M.

Mary Chaco, almost two years old, was a pert, small-boned, blond, brown-eyed girl. She was always spic and span. It was possible to understand much of her ready chatter.

Mary's first year of life had been precarious. A severe case of thrush mouth when she was only two weeks old sent her to the hospital, where she was severely burned in a steam tent. There was great anxiety, first for her life, and then for possible deformity. After several weeks in the hospital it appeared that there would be no lasting damage. However, she was still frail, and after she returned home an abscess formed under one eye which took several months to heal.

Mary's father, Gary Chaco, was a good looking young man. He was respected for the independence of his views and his energy in building up his own service station and car repair business. He was raised in a town not far from Midwest, served in the army, and returned to Midwest after WW II. He was active in the American Legion and was one of the youngest members of the Rotary Club.

Mary's mother, Odessa Chaco, was an attractive and efficient young mother. She was an excellent housekeeper, active in the Homemaker's Club, and president of the American Legion Auxiliary. The Norfolks, her father and mother, younger brother and two sisters, lived in Midwest. The Chaco children were often cared for by their grandmother and aunts.

Otto, Mary's brother, was four years old. A wiry, active boy, he loved to go to the gas station with his father. He played often with Maud Pintner.

The Chaco's rented a small, neat, frame house close to Mr. Chaco's station. The single bedroom held, Mary's crib, Otto's roll-away bed, and the parent's bed. The kitchen and bathroom were modern and well equipped. Gas stoves heated the house. The living room was attractively furnished; the dining room served as a sewing-play room most of the time. The back yard was about 40 x 50 feet but it blended imperceptibly with the yards of the two neighbors with both of whom Mary was on visiting terms.

The Chaco's owned a 1936 Chevrolet which was usually at Mrs. Chaco's disposal, since Mr. Chaco walked to work.

SUBJECT: James Sexton (M, 1-11)  
TIME: February 8, 1951; 7:20 A.M.-8:10 P.M.

At 23 months, Jimmy Sexton was a rosy-cheeked, blond boy with sparkling, brown eyes, just beginning to lose his babyish roundness. He often stumbled over obstacles out of eagerness to get places. His manner was generally alert, vivacious, and friendly. White and even teeth made his frequent smiles particularly winsome. Jimmy talked a lot, often in understandable sentences. He was especially good at manipulating such things as door knobs or toy wind-up trucks. He often wore blue jeans and shirts like those worn by older boys of Midwest.

Jimmy was an only child. His most frequent playmate was Jack Bodin, who was two years and four months old. He also played with other young children when he accompanied his mother to meetings, Sunday School, or downtown. He had some contacts with older neighbor children and with baby sitters, with whom he seemed to get along well.

James Sexton, Jimmy's father, was a tall, rangy, dark-complexioned young man in his late twenties. He had an easy, deliberate manner, a whimsical smile, and liked to "kid" about things. After attending high school in Midwest, he had gone to State College for a short time, until called into the Army, with which he served in the Philippines, among other places. On leaving the army, he had a severe time with asthma, which led him to spend a couple of years in Arizona, after which he returned to the old home farm near Midwest and purchased an additional acreage. He married in 1946. In 1948 he rented a house in Midwest from which he operated his two farms. He and his wife sponsored the Methodist Youth Fellowship and he was active as well in other church groups, the American Legion, and the Masonic Lodge.

Jimmy's mother, Amy Sexton, was a slight, vivacious, blond young woman in her late twenties. She expressed herself forcefully and well. Amy was pleasant, friendly, and direct in her social contacts. She dressed becomingly, making many of her own clothes. Before her marriage, she finished Midwest High School and attended a Radio school in Capitol City. For a short time she was employed in a nearby city in an airplane factory. She returned to Midwest to take a position with the Home State Power and Light Company, which she kept until just before Jimmy's arrival. She was active in Methodist Church groups, Eastern Star, Homemakers' Club, American Legion Auxiliary, and was a leader of the Brownie Scout troop.

Both Mr. and Mrs. Sexton were raised in the neighborhood of Midwest on farms. Jimmy's paternal grandfather and an aunt lived in Midwest. His maternal grandparents lived a few miles east of Midwest on a farm.

The Sextons had a shaggy, docile, black, Scottie dog which was allowed in the house. The dog tolerated Jimmy and his rather rough playfulness very well.

The house which the Sextons rented was set on a slightly raised, grassy lot. Several fine trees and well-placed bushes added to the attractiveness of the yard. The house was a white, frame bungalow with a separate, three-story addition at the back which consisted of a basement, laundry, and glass-enclosed sleeping room. A living room, dining room, kitchen, two bedrooms, and a bathroom were in the main part of the house.

All the rooms were moderately large and light, with the furnishings arranged tastefully. Some of the furniture came with the house but the Sextons had a plastic covered davenport and chair set which was modern and new. The radio-phonograph was evidently used often, and several stacks of magazines and newspapers indicated that reading was a pastime the family enjoyed. The large dining room also served as a sewing room for Mrs. Sexton. The rooms opened into each other in such a way that Jimmy was able to follow an active play pattern in the house.

Mr. Sexton owned a 1949 Ford coupe and a pick up truck. He often used the truck to go to and from the farm, thus leaving the coupe for Mrs. Sexton.

SUBJECT: Lewis Hope (M, 2-11)  
TIME: November 21, 1950; 7:00 A.M.-9:15 P.M.

Lewis, better known as "Chuck," was almost three years old. He was the third in a family of four children. He had straight, light brown hair, a round face and big, blue eyes. Chuck was a robust, sturdily built child. He had an unusually friendly, happy, and winning manner. He spoke clearly and expressed himself well.

Chuck's father, Lewis Hope, Sr., was in his middle thirties. He was slender, of average height, and had intense brown eyes and dark hair. He gave an impression of being agile and having quick energy. Mr. Hope was graduated from the State Agricultural College and taught agriculture in a high school before his appointment as Instructor in the Veterans' Administration's Vocational Farm Training Program in Midwest, where the Hopes had lived just a year. His teaching career had been interrupted by service in the navy which included time in the South Pacific. He was a member of the American Legion, the Farm Bureau, and the Presbyterian Choir. His manner was friendly and confident. He was gentle and comrade-like with his children, of whom he was obviously proud.

The mother, Corrine, also in her middle thirties, was a petite, attractive, blue-eyed, brunette. Her habitual expression was pleasant and calm. She was graduated from the State University and taught English in a high school for several years before her children arrived and while her husband was in the service. She was an active member of the Home-maker's Club, American Legion Auxiliary, Home Demonstration Unit, Eastern Star, P.T.A., and the Presbyterian Church. She was genuinely friendly,

especially with the wives of the veterans who attended her husband's classes.

Stanton, the eldest son, was ten years old and in the fourth grade. He was a slight, handsome, blondish boy who was sometimes called "pretty," much to his disgust. He fit into the neighborhood play groups easily with both boys and girls. He took his stamp collection and the junior choir seriously. He was an active and popular member of the Cub Scouts. Stanton usually played with Chuck, according to his mother, almost as if they were the same age.

Alma, the only girl in the family, was eight years old and in the second grade. She was a dainty, fragile-looking child with dark eyes and hair. An active member of the Girl Scouts, Alma accepted positions on working committees readily. She sang in the Presbyterian Junior Choir.

Ben, the baby of the family, was 11 months old. He was a healthy, happy toddler. The family, including Chuck, seemed proud of Ben and his antics.

The Hope family had two household pets, a large yellow cat and a curly, black dog. They also had three calves and one milk cow which were housed in a small barn on their lot and pastured in a neighboring 5-acre pasture. Chuck proudly claimed one calf as his own.

The Hopes owned their five-room, one-story, white frame house located about six blocks from the business district on a 100 x 200 foot lot. A porch extended across the front of the house and a smaller, uncovered

platform was located at the back door. An old well and a small wash-house were just south of this platform. In the back yard was a cave, with a mound-like roof, where fruits and vegetables were stored. There were some fine old trees scattered about the yard but no particular attempt had been made at landscaping. A spiraea hedge ran along the south property line. Elsewhere the lot was fenced, except across the front. (The house was the same one in which the Reid's lived at the time of the day study on Margaret. See pages 108-109).

The front door of the house opened directly into a small living room, with a vented gas stove. The furniture showed the marks of many moves and of much use. The bedroom to the south of the living room was occupied by the parents, and Chuck's youth bed was there, too. Off the dining room was the other children's bedroom with bunk beds and the baby's crib. The kitchen had a better-than-average gas stove, an electric refrigerator, and a new automatic washer. The bathroom opened off the north end of the kitchen. A general impression of neatness and efficiency pervaded the home.

The Hope's car, a 1947 Chevrolet, was essential to Mr. Hope's work in visiting the farms of his Vocational Agricultural Students.

SUBJECT: Dutton Thurston (M, 3-10)  
TIME: November 3, 1950; 7:06 A.M.-9:16 P.M.

Dutton Thurston, nicknamed Chuck, was three years and ten months old on November 3, 1950, the time of the day study. He had black hair, dark eyes fringed with long, black eyelashes, and a cheerful, sometimes impish grin. He was a sturdily built, active, well-coordinated child.

Dutton was the youngest in a family with three children. His babyhood and growing up time had been marred by attacks of asthma. The family had talked of moving to a different climate because of Dutton's asthma, but it appeared that his improvement would make this unnecessary.

Dutton's most constant playmates were his big pet dog, Spot, and a kitten, called Inky, which belonged to his sister. No family with children lived near the Thurston's.

William Thurston, Dutton's father, was a slender, medium-tall, dark-complexioned man. He had been brought up on a farm in the county and had farmed for most of his life. He was also a good mechanic. The Thurston's rented a place just at the edge of Midwest, with something under sixty acres of pasture land. Mr. Thurston also owned some land within five miles of town which he farmed. The Thurston's had several dairy cows on their rented place, and also a number of pigs, chickens, and horses. Adding to the work these entailed, Mr. Thurston had recently accepted full time employment at the Midwest Hardware and Implement Store as a mechanic.

Mrs. Thurston was a tall, attractive, brunette. She had been brought up on a farm in the country and had completed high school in a neighboring town. She was energetic and gave the impression of being a person

who worked hard. She was president of the P.T.A. and a member of the Homemaker's Club. Mrs. Thurston raised chickens and helped take care of the milk cans, but she did no work in the barn. She clerked on Friday mornings and all day Saturday's in Cabell's Department Store.

The oldest child in the family was Alfred Thurston, commonly called Al, who graduated from Midwest High School in 1950. He starred in football and basketball. He was a good-looking, dark haired young man. He lived at home and was employed as a mechanic at the Midwest Hardware and Implement Store where his father worked.

Shirley, who was fifteen years old, was a sophomore in high school. She was an attractive, dark-haired, dark-eyed girl, with a warm and friendly manner.

The maternal grandparents lived in Midwest. Dutton's grandfather worked in Hopkins Feed Store. The paternal grandparents still lived about six miles from Midwest.

The house which the Thurston's rented was a recently painted, big, farm house. It was attractively located in a large, grassy, fenced-in yard with the barns and other outbuildings some distance away on the other side of a drive-in area. It had electricity but no running water. The stoves were kerosene, wood, and oil, since no gas line extended to the house.

Dutton shared a down-stairs bedroom with his parents. Alfred and Shirley each had a room upstairs.

The Thurston's had a big 1948 International truck. Al owned a car which the family used on occasion.

SUBJECT: Margaret Reid (F, 4-6)  
TIME: June 2, 1949; 8:00 A.M.-10:17 P.M.

On June 2, 1949, Margaret Reid was four years and six months old. She was a daintily-built child of average height for her age. Margaret looked fragile, but she had a good health record. She was animated and alert with a happy disposition. Her light blue eyes had a saucy, upward tilt at the outer corners which gave her a pixy expression. Her silvery blond hair was kept curled by her mother. Her mother and maternal grandmother made her many pretty clothes. Margaret attended Vacation Church School.

Although seemingly shy at first glance, Margaret adjusted quickly to new people and situations. The playmate nearest her own age in the neighborhood was Wally Crowther, who lived only a few houses away. Across the street lived ten-year-old Ellen Thomas for whom Margaret showed great admiration and affection.

Margaret's family was composed of her father, mother, and 18-months-old brother, Bradley. Both maternal and paternal grandparents lived in Midwest and were frequent visitors at the Reid home.

Milton Reid, Margaret's father, was one of a pair of twin boys. He was a large-framed, blond, young man about 26 years of age. He worked in Kerr's Grocery. Milton Reid's chief hobbies were raising hunting dogs, and hunting -- the kind that consisted mostly of listening to and following the hounds. He owned fourteen dogs which were penned in the Reid's back yard. Milton and Frances were married soon after their graduation from Midwest High School. He was not in the armed services because of residual effects of rheumatic fever.

Frances Reid, Margaret's mother, was a pretty, vivacious, velvety-eyed brunette, about 24 years of age. She wore her hair in a long, youthful bob. She possessed a beautiful singing voice and actively participated in many social affairs in the community because of this talent. Mrs. Reid was a friendly person and fit into the community comfortably and happily. She was active in Methodist Church groups and attended the Methodist Sunday School with Margaret and Bradley.

Bradley was a chubby youngster who delighted in "getting into" everything. His parents and grandparents tolerated this as a "boyish" trait since Margaret had not been so inquisitive.

Tiny, a small puppy, was the children's pet. Margaret was possessive about the puppy. It was kept in the wash-shed near the rear of the house. Because of its young age, it was not allowed to run freely in the house.

The Reids owned their home, which was a one-story, white, frame building consisting of a living room, dining room, kitchen, bathroom, a bedroom for the parents, and a bedroom for the two children. It had plenty of shade and play space around it. The home was heated with gas stoves.

Mrs. Reid used a 1935 Ford for herself and the family. Mr. Reid had a 1936 Ford, fixed with a crate arrangement to transport his hunting dogs.

SUBJECT: Maud Pintner (F, 5-0)  
TIME: December 5, 1950; 8:26 A.M.-7:44 P.M.

Maud was just a few days over five years old on the day of the study. She had not yet entered school. She was a blond, blue-eyed girl of small, wiry, build with more than average agility and pertness. Her face was mobile, reflecting her emotions readily. On ordinary days, she dressed in brightly colored, cotton flannel shirts and jeans; at Sunday School or parties, however, she wore pretty dresses.

Maud learned to talk early and, before she was two, knew by heart many nursery rhymes. The family had a recording of these made by her when she was three years old. Maud often enlivened Sunday School programs and Ladies' Aid meetings with a recitation or song.

Maud's most frequent playmate was Otto Chaco, a boy about a year younger who lived several blocks away. She also played with some younger children of the neighborhood with whom she often assumed the role of leader. She attended the Presbyterian Sunday School and was eager to attend public school.

Maud's family consisted of her father and mother, her twenty-months-old brother, Frederick, and her maternal grandmother, who was a permanent invalid due to arthritis. Until a few weeks before the day study, her uncle, Tom Wiley, a lawyer in his middle thirties, made his home with them. At this time he married and rented an apartment a few blocks away. He still was an important member of the family in that his piano hadn't yet been moved and his music pupils came to Maud's house for their lessons.

Charles Pintner, Maud's father, was a dark-haired, slight, easy-going man in his late twenties. He was always well-dressed. Although rather quiet in social situations, he was a very popular member of the younger businessmen's group in the community. He was graduated from the local high school, had a year of college work, and also had some specialized bookkeeping training. He served in the army and when he was discharged, he went, with his wife and baby daughter, to Alaska, to join a brother in the operation of a store there. The family was not happy so far from home. They returned to Midwest in the summer of 1948, and moved back with the maternal grandmother where they had lived previously. Charles joined his brother-in-law, Peter Wiley, in the abstract business and later took over completely the operation of the company. Charles Pintner belonged to the American Legion, and the Presbyterian choir.

Della Pintner, Maud's mother, was in her late twenties. She married Charles a year or two after she was graduated from high school. She was a petite, blond, fragile-looking woman with a quick, emphatic manner and an attractive smile. She was born and raised in Midwest. She worked as a stenographer in the County Welfare Office in Midwest after she was graduated from high school and for a brief time in the bookkeeping department of the Army before she and Charles married. Della belonged to the Eastern Star, the Presbyterian Church Choir, the American Legion Auxiliary, and a womens social club.

Freddy Pintner was a blonde, blue-eyed, active child, quite able to put up with Maud's occasional fairly rough activities.

No report of the family would be complete without mentioning Kemo, the rather nondescript, large, long-haired dog, who was eager for affection and a long-suffering playmate. He had a lap-dog disposition with an outdoor-dog size.

The modern, white, frame house in which the Pintners lived belonged to Maud's maternal grandmother. It consisted of a living room, music room, dining room, kitchen, dinette, 4 bedrooms, and a bathroom, all on one floor. The house furnishings, many of which were antiques, were attractive and arranged tastefully, though casually. Many full book shelves, a record player, and a grand piano indicated some of the family pastimes. The yard surrounding the house was unusually well landscaped which added to the total impression of charm and comfort.

The Pintner car, a '37 Plymouth, was used chiefly by Mrs. Pintner for shopping in town or taking trips to neighboring towns.

SUBJECT: Roy Eddy (M, 6-2)  
TIME: February 22, 1949; 7:00 A.M.-8:31 P.M.

On February 22, 1949, Roy Eddy was just over six years of age. He was of about average height and weight for his age. He had medium brown hair which he wore in a modified crew cut; large, inquiring, grayish eyes, and a rather quiet, relaxed manner. Roy looked quite robust, in spite of having had pneumonia the previous winter. Roy was in the first grade in school. He lived with his father, mother, two older sisters and one older brother.

An outstanding characteristic of Roy's life was his independence. Mr. and Mrs. Eddy worked outside the home and the older children were often away. Many times Roy went home and prepared his own lunch and quietly read during the lunch hour before returning to school, and it was not unusual for him to get home in the evening before the rest of the family, to put on the light (which he had to stand on a chair to reach), and get himself to bed.

Roy often played with Thomas Woodale, Geoffery West, Raymond Birch, Fred Wecker, and Blake Herzog, all 6 or 7 years old. Sometimes he played with neighbor children, among them nine-year-old Douglas Crawford. Roy frequently played on the Court House lawn near the cafe where his mother worked. His chief play interests were cowboys and cars. His constant prop was a toy gun.

Roy attended the Presbyterian Sunday School regularly, along with his older sisters and brother. He won a perfect attendance award in 1948-49.

Martin Eddy, the father, farmed until about 1945 when he moved to town because of his health. He worked on the County road crew. He was a tall, slender, dark-complexioned man with bushy, black hair. He had a pleasant, deliberate manner of speaking and was well liked by the men about the town square. He liked a game of pool and a card game now and then. Martin Eddy was one of the advisors for the 4-H group, which indicated his genuine interest in his children.

Claudia Eddy, the mother, was a brisk, busy woman. She seemed to have a large fund of both patience and good nature. Mrs. Eddy was a sincere, friendly, communicative person. She always looked neat and well-groomed. She worked as a cook in a local cafe, helping to plan and manage as well as cook. Besides this, she managed to encourage and work with her children, especially in their 4-H projects. Mrs. Eddy seldom got to Sunday church functions because of her job, but she willingly took her turn in helping with Sunday School class parties, Ladies' Aid dinners, and meetings of the Parent-Teachers Association and the 4-H Club.

The entire family, Roy excepted, contributed to the family economy. The oldest sister, Lola, was a junior in high school and worked at Poole's Grocery after school. She was president of the local 4-H group. Mollie, a freshman in high school, was an unusually pretty, dark-eyed girl who was popular with her age group. She was paid by her mother to do most of the housework. She, also, was very active in 4-H work. Vernon, a twelve-year-old, was a big-boned, pleasant boy who looked much like his father. He was very interested in 4-H work and was raising two

calves besides milking the family cow. He delivered the weekly advertising sheet for Kane's Grocery.

Mr. and Mrs. Eddy were natives of Midwest State and both had been reared on farms. At this time, Mrs. Eddy's parents lived in a small, nearby town while Mr. Eddy's parents were on a farm near enough to Midwest that they often attended the Presbyterian Church services.

One got the impression of real family unity and enjoyment of each other from stories which the Eddys told. They joked about how a deck of cards saved their marriage and their sanity during the depression days. A Cocker dog was an accepted part of the family group, with much affection lavished on it. The entire family seemed to feel responsible for Roy but he didn't seem to be babyish because of it. The Eddy home was often thrown open to groups such as the 4-H Club and Sunday School class parties. It was a family with a busy air, with many people coming and going freely, and a generally pervasive feeling of friendliness.

The Eddys rented an old, one-story, white, frame house. There were two bedrooms, a dining room, kitchen, bathroom and living room. All meals were eaten in the large-sized kitchen, leaving the dining room for Roy and Vernon as a sleeping room. The furnishings throughout the house were sturdy and worn. The floors were covered with linoleum rugs and the house was heated by gas stoves. The lack of closet space and the varied activities of the family resulted in many things being left out in sight. The upright piano was laden with papers and magazines as well as music. The sewing machine, open as if used often, was piled with partially made garments.

The family car, a '38 Dodge, was usually seen with young people in it, since neither parent used it for transportation to work.

SUBJECT: Benjamin Hutchings (M, 7-4)  
TIME: November 23, 1948; 7:33 A.M.-8:00 P.M.

Benjamin Hutchings at seven years and four months of age was a slender, dark-haired, sober-faced child. He appeared quiet and seemingly preoccupied a good deal of the time but this was offset by his alertness and sparkle when entertained or aroused. Ben, as he was most often called, was taller than the average for his age group. He was in the second grade. His most constant playmate was Morris Bryan, a first grader, but he also played with other children in the neighborhood.

James Hutchings, Ben's father, had a law office over the bank in Midwest. Mr. Hutchings was tall, slender, and dark, with a reserved but friendly manner. He had his law degree from the State University and had been established in Midwest about five years. Verna Hutchings, Ben's mother, was a short, vivacious brunette. She worked part-time as secretary in her husband's office. She had worked as a newspaper woman after completing college and before her marriage. Both Mr. and Mrs. Hutchings were active in the Methodist Church. She had been president of the Methodist Ladies Aid and he, chairman of the church governing board. The Hutchings were active also in community and social circles, with membership in bridge clubs, a women's social club, the Rotary Club, and the Parent-Teachers Association. Mrs. Hutchings, as chairman of the troop committee, had kept the Girl Scouts afloat as a community organization.

Ben's sister, Sarah, was ten years old and in the fifth grade. She was a cheerful, efficient child and active in school, church, Girl Scout, and 4-H groups. Ben shared two pet dogs and one pet cat with his sister.

The Hutchings lived in their own home, a roomy, two-story, white, frame house on a spacious corner lot. The landscaped grounds included an outdoor fireplace, picnic table, grassy play space, chicken and play houses. A fair-sized vegetable garden was an annual family enterprise. The house was equally comfortable and attractive inside, with each child having a bedroom and sharing an attic playroom. Music and books were easily available to the children, which added to the general impression of comfort and ease in the home. A 1947 Plymouth provided the Hutchings with transportation.

SUBJECT: Raymond Birch (M, 7-4)  
TIME: April 26, 1949; 7:00 A.M.-8:33 P.M.

Raymond Birch was a sturdy boy, slightly shorter and heavier than the average boy of his age. At seven years and four months, he was the youngest among the second graders in the Midwest school. His dark hair was usually slicked down and his brown eyes often lit up with a friendly smile. Grownups of Midwest remarked that he was good-looking and impish.

Raymond was an only child. He had no relatives in Midwest, but both his maternal and paternal grandparents lived on nearby farms and he was a frequent visitor in their homes.

Jack Birch, Raymond's father, was a dark, friendly man in his early thirties. Raymonds mother, Joan Birch, was an attractive, well-groomed brunette in her late twenties. After graduating from the same high school in a small town near Midwest, both Jack and Joan Birch had been employed in a government agricultural office in Midwest. They were married in 1941. Raymond was born a year later. Mr. Birch took a position in a nearby war plant where the government classified him as essential for the war's duration. The family lived in a housing unit near the plant. When the plant closed down after the war, Mr. Birch returned to Midwest to accept a position with The Midwest Hardware and Implement Company. Mrs. Birch did not work outside the home until Raymond entered school, when she took a position in the office of the County Clerk.

Honey, a black and white fox terrier, was old, fat, and broad. She was considered to be almost a member of the family, especially by Raymond.

The Birch family rented an apartment in a white, frame house, which though more than sixty years old, was well preserved and modernized. There was an adjacent apartment on the ground floor and one above them. Since the Birches had more than half the space in the house, they were also responsible for the care of the premises. The house was on a corner lot along the side of which ran the town's busiest highway. There was a tall barn, a double garage, place for a vegetable garden, and a well kept lawn. The whole place looked neat and comfortable.

The apartment had a living room, dining room, kitchen, two bedrooms, and a bathroom. The rooms were light and clean. In Raymond's room his boyish treasures were in full view. These included a small basketball goal, fixed to the back of his bedroom door.

The family car, a 1936 Chevrolet, was used largely for visits to the relatives and for fishing trips.

SUBJECT: Mary Ennis (F, 8-7)  
TIME: May 12, 1949, 7:00 A.M.-9:25 P.M.

Mary Ennis was a blond, blue-eyed, eight-year-old; she was rather small-boned and dainty. She was in the third grade. She took piano lessons, sang in the Junior Choir, belonged to the Brownie Scouts, and attended the Methodist Sunday School. Mary often played with Constance Sherwin, Susan Hebb, and Betty Reeves, neighbor girls about her age.

The family dog, Chico, a large, white Shepherd, was much beloved by Mary. He enjoyed running with her when she rode her new bicycle.

Arthur Ennis, Mary's father, was a civil engineer employed by the Federal Government; he was in charge of a county-wide project. He had had specialized college training for his work. Mr. Ennis had remained an active reserve officer following extended service in the army. He was active in the community, belonging to the Rotary Club, teaching an adult Sunday School Class, and singing in the Methodist Church Choir and a male quartet.

Mary's mother, Penelope Ennis, besides being a good housekeeper was also a mainstay of a number of community activities. She directed the church choir, was president of the Methodist Women's Evening Guild, belonged to a women's social club, the Rotary Anns, and the American Legion Auxiliary. She was in demand as an accompanist or soloist at musical functions. Before her marriage, Mrs. Ennis had taught rural school following a short training course.

Timothy, the long-awaited second child was a happy, healthy, seven-months-old boy.

The Ennis family had lived in Midwest three years. They bought their home and had done much to make it efficient and attractive. The house was furnished entirely with antiques or good reproductions many of which had been refinished by the Ennis family.

The house, all on one floor, had a living room, a dining room, two bedrooms, bath, a modern kitchen, a large screened back porch and a basement laundry and utility room.

A Spinet piano added to the charm of the living room, and a new gas furnace added to the comfort of the house.

The Ennis home was cater-corner from the Hutchings. It had a relatively small yard (40 x 50 ft), but a magnificent tree, with a wonderful swing, shaded an attractive play place.

Mr. Ennis used his 1937 Plymouth in his work which carried him all over Midwest County.

SUBJECT: Douglas Crawford (M, 9-2)  
TIME: April 18, 1949; 7:28 A.M.-9:45 P.M.

Douglas Crawford, on April 18, 1949, was nine years and two months old. He was in the third grade, and larger than any other child in the third and fourth grade room. Douglas was well built, weighed about ninety pounds and had an enviable reputation for strength, toughness, and physical prowess. He was a fearless tree climber. In this connection, his father said not to worry, "he has a fine sense of balance just like me." Douglas had a lively interest in hunting and fishing and also in rocks, fossils, flowers, and animals.

Douglas was a blue-eyed, blond boy, dependent on his glasses for adequate vision, and greatly bothered by them in his playing. His genuine good looks were sometimes marred by a sober, moody expression.

Douglas' immediate family consisted of his father, mother, thirteen-year-old brother, Thomas; and six-year-old sister, Norah. Also, very important to the whole family were the maternal grandparents, the Tiltens, who lived on a farm about a mile south of town. Thomas lived with his grandparents much of the time to help his grandfather with the chores.

James Crawford was in his middle thirties, a well-proportioned, six-footer -- proud of his strength. He kept some cows to milk, raised some pigs, owned ten acres west of town, and had acquired some land adjoining the maternal grandfather's land. He did farm labor for others as well as sawing timber with a motor driven saw. Just preceding his marriage, some fifteen years before, he was injured when

a team ran away with him. As a result of this injury, he had to give up farming, and for a time kept a small grocery store in town. Later he drove a transport truck on a regular route. Although James was graduated from the local high school, his family home was in Illinois.

Polly, Douglas' mother, was the younger of two daughters. She was a stout, energetic woman. Both sides of her family were old county residents. Her father's family was in the banking business; and her mother's father ran a bookstore. Polly's sister was graduated from State College and was employed in adult education work. Polly chose to marry when she completed high school. She worked hard at the never completed tasks of housekeeping, taking care of milk, sewing, and helping with the animals and the garden.

Thomas was a husky, six-foot, eighth grader. He had worked in Denton's drug store, besides helping at his grandfather's farm. Norah was a sociable, independent child. She had just turned six and would enter school the next fall. She, also, was somewhat large for her age.

All the family attended the Presbyterian Sunday School. Douglas was well on toward his seventh year of perfect attendance, and the other children were equally regular. Mrs. Crawford was secretary of the Ladies' Aid and a member of the Missionary Society. None of the family stayed for church service regularly.

Douglas played a good deal with 12-year-old Vernon and six-year-old Roy Eddy who lived just a block away. He also played often at the Howells' house with Van, who was 11 years old. He sometimes helped his grandfather by running a tractor.

The Crawfords lived in a large, old, white, frame house with about an acre of land around it. The house was heated by gas stoves. There was electricity and city water but no bathroom. Downstairs there was a kitchen, dining room, living room, the parents' bedroom, and a utility room. Norah and the boys had bedrooms upstairs. The boys' room was full of trains, comics, and rocks. Norah's room was newly decorated and neat. The rooms were somewhat crowded by extra furniture just inherited from Mrs. Crawford's paternal grandmother.

Between their house and their neighbor's, was a large lawn. West of the house were a number of miscellaneous sheds and chicken yards in which there were always chickens, pigs, and a cow or two. The Crawfords always planted a large vegetable garden. Douglas helped to care for the animals and the garden.

A Model-T Ford truck, mounted with a power saw for felling trees, was not only an essential piece of equipment for Mr. Crawford's work but also provided the family with transportation.

SUBJECT: Claire Graves (F, 10-9)  
TIME: January 28, 1949; 7:20 A.M.-9:40 P.M.

Claire Graves, ten years and nine months old, was a slight child with dark eyes and curly, black hair. When animated she was vividly pretty. Her health had been generally good. She was about medium height for her age, but looked less mature than many of her classmates. Claire belonged to the Girl Scouts and attended the Methodist Church where she sang in the Junior Choir.

Claire's parents, James and Betsy Graves, were married when they were graduated from high school. They were in their middle thirties. They both came from Midwest County families. Mr. and Mrs. Graves decided that a large family did better living in a small town, so they had moved to Midwest about five years before, though Mr. Graves continued to work in the city.

Mr. Graves was a rather short, stocky, man; he was quiet, and pleasant faced. He worked in the city at the railroad yards at construction work. He was subject to transfer, however, to other yards in the general area. At best, he got home twice a week.

Mrs. Graves was a slender, attractive woman with vivid coloring. She had been critically ill before Charles' birth and afterward. At the time of the study, however, she was in fair health but, as she said, "always doctoring." Mrs. Graves was president of a club of young married women which she had helped to organize. She was a member of the Parent-Teachers Association and the Methodist Church.

The children in the family were Wendell, a high school junior; Ruth, a sophomore; Stanley, an eighth grader; Claire, a fifth grader,

Frances, a fourth grader, and Charles, who was four years old and not yet in school.

Wendell and Stanley worked regularly mowing lawns, shoveling snow, and operating an evening paper route. Ruth took much responsibility at home and did some baby sitting. Frances was a quiet child and she and Claire were good playmates. Charles, the youngest, was bright-eyed and active.

Claire had definite duties at home in connection with the house work and the care of her youngest brother. She sometimes helped her older brothers with their paper route, and she often helped with the shopping.

Included in the family were a big dog and several cats. Mrs. Graves made an effort to keep them outdoors.

The large living room and kitchen of the Graves' one-story frame house were the center of the family activities, particularly in winter when the coal stove kept these rooms warm. There was a bedroom for the girls, one for the older boys and one for Charles and his parents. The kitchen had running cold water and a gas cooking stove. There was no bathroom in the house, which was located where city water and gas had only recently become available.

The large yard provided plenty of play space, room for a big vegetable garden, and a chicken yard.

Mr. Graves used the 1937 Ford to get to and from work, so it was usually available to the family only on week ends.

SUBJECT: Wally Wolfson (M, 4-3)  
TIME: July 9, 1951; 8:00 A.M.-7:35 P.M.

Wally Wolfson, four years and three months old, was an attractive, blond child of a little more than average height and of about average build. He lived with his family in Manchester, a small town near Midwest. Wally was unable to walk because of the sequela of polio-myelitis. He could stand with support and pulled himself up on things readily with his strong arms and shoulders. He had full leg braces which he used when he walked with crutches. Ordinarily, though, around the house, Wally either crawled on his hands and knees, which he did very adeptly, or he was carried. Outdoors he used his express wagon; he put one knee in the wagon and pushed with the other leg.

Wally was usually dressed in overalls and a T-shirt. Every effort was made by his mother to keep him clean and neat. Crawling, though, wore out his overalls and got them unusually soiled.

Wally's health was excellent except for his disability. He was a little past two when he had polio. At that time he was not very sick. The family failed to recognize his illness as serious until he was unable to use his legs. Because of the mildness of the acute stage, the doctors at first thought Wally would not be permanently paralyzed. Since leaving the hospital he had had physical therapy treatments and electric stimulation in a nearby city. In addition, Mrs. Wolfson gave Wally infra-red heat treatments and massage twice a day.

Wally's parents regarded him as a brighter than the average child, and more thoughtful. His aunt remarked that other children just barged ahead and tried something out, but Wally had to think it over. She thought this made him seem more mature than other four-year-olds.

Wally's immediate family consisted of his father, his mother, and a younger sister, Maud, not quite two years younger than he.

Almost within the family circle were Wally's aunt, uncle and his four cousins, who lived in the next house. His cousins were Dorothy, thirteen; Jimmy, eight; Ben, six; and Betty, two. These children were Wally's and Maud's constant playmates.

Two younger brothers of the father, Phil and Rex, were often in Wally's home. Wally's paternal grandparents lived on a nearby farm. The Wolfson family were Midwest county people and a good many branches of the family lived in the vicinity.

Mr. Douglas Wolfson, the father, was in his middle twenties. He was a veteran of World War II. At the time of the study, Mr. Wolfson was doing carpenter work on an individual basis, but he had recently been employed by a contractor over a period of months in State Capitol. Doug Wolfson was a tall dark complexioned man who gave the appearance of having a good deal of physical strength.

Mrs. Wolfson's family lived in southern California, but they came from Manchester. Mrs. Wolfson went to High School in Manchester where she knew Doug. They met again when he was stationed in California, and were married there. The Wolfson's tried living in California, which she liked, but Doug preferred living near his family. Wally had visited his maternal grandparents in California, and they were in close contact with the family.

Wally's younger sister, Maud, was a very attractive blond child, active and a little shy. She was able to talk quite well for a child of her age. In the home too, there was a hunting dog which had a litter

of very young puppies at the time of the study. It was obvious that both the father and mother were affectionate and warm in their dealings with their children.

The Wolfson's lived in an old, white, frame, two-story house. The living room looked as if it could have been modeled from a magazine advertisement. It had chartreuse plastic drapes, a green and gray blocked linoleum floor covering, wine colored furniture and unusually modern ivy wallpaper on a dark background. There were two bedrooms upstairs. The house belonged to the Wolfson's and they had done a great deal to improve it. Manchester lacked city water so the Wolfson's had a pump and an outdoor toilet.

Wally had a number of play things-- a wagon, a tricycle and quite a few toy trucks. There was a blanket on the front lawn for the children to play upon.

The Wolfson's owned a 1941 Plymouth Sedan which appeared to have had very hard use.

SUBJECT: Sue Dewall (F, 7-1)  
TIME: June 6, 1951; 6:30 A.M.-8:08 P.M.

Sue Dewall was almost a month over seven years old. She was in the first and second grade group at the Lawton Foundation, a private school for crippled children, located in Capitol City.

She was a slight, small-boned, fair-skinned girl with straight, taffy-blond hair. She had a round, almost boyish, face, accented by sharp features and straight hair which was cut just below her ears. She moved characteristically in a quick way. Sue's manner was intent, childishly serious and vigorous. She usually wore a short, clean, cotton school dress, orthopedic shoes, and anklets. She also wore plastic-framed glasses to help correct a rather severe myopia. The impression of serious intensity was derived, in part at least, from the way she bent her head close to whatever she was doing.

Sue was forty-five inches tall and weighed just under 50 pounds. She was diagnosed cerebral palsy, spastic type, and although her general health on entering the Foundation was poor, she was in fair health at the time of the study.

Sue had less strength than a non-handicapped child, yet she stood out in the group at the Foundation as one of the more active children. Sue could do almost anything expected of a normal child, although she would be perceived to be a handicapped child. In general she handled herself so well that her appearance minimized rather than accentuated her handicap. She walked on the balls of her feet and, as she hurried along, held her arms akimbo. When she ran, it was with an unsteady,

tripping flurry, not as fast as a normal child, but with as much energy. Her picture coloring with crayons was not particularly neat, but this appeared to be not so much a function of her physical impairment, as of her energetic, forceful personality.

Sue was born three months prematurely; she weighed only 29 ounces at birth. Her mother died soon after Sue's birth and Sue was raised by an older, married sister until her admittance to Lawton at five years of age. Since then, she had been a full-time resident of the Foundation.

Sue was described at the time of her entrance into the Foundation as having few social graces. The staff members mentioned such things as her disorderliness and destructiveness in connection with her own clothes and toys. During her two years at the Foundation, she had learned to keep herself and her things neat and clean.

Staff members who had been around Sue for a considerable length of time pointed out her social techniques for getting the things she wanted. Although this was sometimes seen as "soft-soaping" it appeared to be a symptom of Sue's real need for affection. The brightest days in Sue's life were the rare ones, often two or three months apart, when she received a letter from one of her sisters. On these days she was jubilant and wanted to show the letter to everyone.

The Lawton Foundation staff members often had a difficult time keeping Sue in her bed at night. She got up, played around, went to the bathroom, did everything but stay in bed. Sue herself told stories of the difficulties she had at night, of being unable to sleep and of frightening dreams.

Sue's father was a man in his early forties, who worked intermittently as a day laborer.

The Dewall's house was a small, unpainted shack, in poor repair. Sue's oldest sister, whose husband was employed by a public utility company, kept a pleasant, simple home.

Sue was the youngest of seven children, all of whom lived with the father except the oldest sister and Sue herself. Of the other children in the family, one sister was married and lived in the father's home with her husband and a young child. This sister made an effort to keep the home going. Other children in the family were a thirteen-year-old sister, an eleven-year-old brother, and an eight-year-old sister. Since coming to Lawton, Sue had rarely seen any of her family.

SUBJECT: Bobby Bryant (M, 7-4)  
TIME: March 26, 1949; 8:35 A.M.-9:42 P.M.

At seven years, four months of age, Bobby Bryant was living a very restricted but, for him, busy and interesting life. He had been a "pink and pretty" baby at birth but almost immediately his skin coloring became a noticeable blue from lack of oxygen; his lips a deep purple. His condition was diagnosed as Eisenmengers Complex. Because of the opening in the interventricular septum much of his blood, after returning to the heart, entered the peripheral circulation without first going through the lungs. As he developed physically, his wrists remained unbelievably thin and his match-stick fingers blunted at the tips. Bobby grew, despite negative prognoses, and hope also grew that his condition might be helped. When he was five years old, Bobby was taken to Johns Hopkins Hospital at Baltimore, Maryland, for examination. The doctors indicated that if he could be kept alive for two years longer, perhaps an operation could be performed. The two years passed. Bobby's growth seemed to be at a standstill. It was still very uncertain that anything could be done surgically for Bobby.

Bobby's family was composed of his father, mother, two brothers, and his paternal grandmother. Bobby's father, Mr. Bryant, was a professional man whose work kept him away from home a good deal, but he tried; in spite of this, to keep up a warm and positive relationship with his three sons.

Bobby's mother, Mrs. Bryant, was an attractive woman in her thirties. She had married before completing high school. Although her main interest was to make a comfortable home for her family, she also was active social-

ly in the group made up of her husband's colleagues and their wives. Mrs. Bryant felt more keenly, perhaps, than anyone else, the responsibility of Bobby's care.

Bobby's brothers, Kenny, an eleven-year-old, "All-American boy" and Jack, an active three-year-old, spent much of their time with other children. However, in their moments with Bobby, Kenny was likely to treat him with gentle, teasing brusqueness, partly, perhaps to cover up the fact that he knew much about Bobby's disability, while Jack seemed entirely innocent of the fact that his brother was not like other children.

An important member of Bobby's family was Grandmother Bryant, who had come to live with them when Bobby had first shown a desire to "learn." She was the widow of a Methodist minister and had been a public school teacher, so that she had the required background for tutoring Bobby, as well as the understanding and love required to deal with Bobby's particular situation. At sixty-five, she was warm-hearted, youthfully white-haired, and knowledgeable--a mainstay for every member of the Bryant family. She accepted Bobby as her particular charge.

The Bryant's house, a white, two-story frame structure, was in a middle class neighborhood. It was about sixty years old. It had an elusive sort of charm in both its outside and indoor appointments. Set on a large lot, it was surrounded by trees and shrubs which softened its severe lines. It was located on a much traveled street, but

there was ample space around it since the adjacent lot was vacant.

Since the Bryant home was near Mr. Bryant's place of work, the family had no car.

SUBJECT: Verne Trennell (M, 7-5)  
TIME: June 21, 1951; 7:00 A.M.-9:32 P.M.

Verne Trennell was a seven year, five-months-old day student at the Lawton Foundation. He was a pleasant-featured boy with unusually rosy cheeks. He had straw-colored hair, a few strands of which often hung over his forehead. Verne wore plastic-framed glasses to correct his crossed eyes. He walked with Canadian-type crutches. His gait on these crutches was fascinating. Rather than placing the two crutches on the ground and swinging his body between them, Verne used the crutches as extensions to his arms and walked with a four-legged gait. He chopped along when he was in a hurry, using his arms, extended by the crutches, as extra legs.

Verne had been a day student at the Foundation for almost two years, and had made such progress in school that he expected to start as a second-grader in a parochial school the next fall.

Although his range of activities was restricted by the crutches, Verne was "all boy" in his interests. He was known around the Foundation as stubborn and a great tease, but one got the impression that he was well liked by the staff members who worked with him.

He was born on January 30, 1944, and was recognized immediately as not being a normal child. He was operated on during his first day of life. The diagnosis taken from the report of a general physical examination of Verne, in September, 1949, was as follows: "Neurogenic bladder, probably of hypotonic type, resulting from the congenital anomaly Spina Bifida". Verne's physical condition at the time of

entrance to the Foundation was complicated by several features. The rather large appearance of his head appeared in the physical examination as a slight hydrocephaly. His eye-sight was impaired by an internal strabismus. A grade two systolic murmur was noticed in the heart examination. A slightly enlarged abdomen was noted, as well as undescended testicles.

Due to neural damage, Verne's legs were partially paralyzed and he had no bladder control. He was forced, therefore, to wear a rubber urinal strapped to his right leg. A rubber tube fit rather tightly over the end of his penis and drained into the rubber bladder. The family and the Foundation Staff worked hard to teach Verne to empty this urinal every two hours. However, since he had no sensitivity to the apparatus, he was inclined to forget it and allow it to overflow. The rubber tube caused recurrent infections around the glans penis. He had been circumcised to help correct this condition, but there had been no noticeable improvement.

Verne's general health had been good, aside from the usual childhood diseases: measles, chickenpox, and scarlet fever.

On week days Verne was at the Lawton Foundation from 8:30 A.M. to 3:30 P.M. On Sundays he went to Church and Sunday School with his parents. Verne had won a perfect attendance pin the previous year. The Trennell family said grace at meals and had daily devotions.

Verne played around the neighborhood and seemed to get along rather well with children there, though he was sometimes left behind, unable to keep up with them. He liked to color and read story books from school,

especially during the winter months, but enjoyed playing outside when the weather permitted.

Verne's family consisted of two older sisters, one younger sister, and his father and mother. They lived in a working class suburb of Capitol City.

Mr. Trennell, a quiet, gentle appearing man in his middle thirties, worked at an industrial plant in Capitol City as an inspector. He was a member of his union's Executive Council, and was chief steward of the union at the plant. Working in an essential industry prevented Mr. Trennell from being called into military service. He was a member of the school board at the Lutheran School Association and Superintendent of the Lutheran Sunday School. He encouraged Verne to help him repair the car, to fix things about the house, and to be as independent as possible.

Verne's mother was a slender, talkative, rather anxious-looking woman in her middle thirties. She was neat and well groomed. She did her own housework, sewed for the girls and canned fruits and vegetables from the garden. She was active in the Church where she was a member of the choir and taught a Sunday School class. Mrs. Trennell and her husband had worked closely together in their effort to give Verne the care his handicap demanded. Necessarily, however, the main responsibility of his care was hers. However, Mr. Trennell often took over when he was home.

Verne's oldest sister, Sarah, worked as a carhop at a drive-in restaurant in the afternoons and evenings. Two sisters, Sherlyne, nine, and Saralee, five, were at home. Verne played considerably with Saralee.

Cuddles, a Fox terrier, belonged to Verne and was his close companion. The Trennells described how wide-eyed and happy Verne had been when Cuddles was given to him.

The Trennells owned a house which was located in the east part of Capitol City, on a dirt road in a section where the houses were spaced rather far apart. Almost every house in neighborhood had a garden, as did the Trennells. The house appeared to be in moderately good repair. It was a white, frame house made up of a kitchen, living room, bedroom, and bathroom. An additional room was being repaired as the girls' bedroom; meanwhile, the girls' bed was in the living room. The lawn and vegetable garden were moderately well kept. There was a large area of play space in the yard.

The family owned a 1940 Chevrolet which was in good repair, and a 1935 Pontiac, which the father used to go to and from work.

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