



21766243



This is to certify that the

dissertation entitled

CASE STUDIES OF A HYPERACTIVE CHILD AND A  
NONHYPERACTIVE CHILD: A LOOK AT THEIR  
PATTERNS OF ATTENTION/CONCENTRATION

presented by

Kathryn V. Den Houter

has been accepted towards fulfillment  
of the requirements for

Ph.D. degree in Counseling, Educational  
Psychology, and Special  
Education

  
Major professor

Date July 1988



RETURNING MATERIALS:  
Place in book drop to  
remove this checkout from  
your record. FINES will  
be charged if book is  
returned after the date  
stamped below.

MAGIC 2

NOV 26 1998

MAGIC 2

JAN 1 1999

CASE STUDIES OF A HYPERACTIVE CHILD AND A  
NONHYPERACTIVE CHILD: A LOOK AT THEIR  
PATTERNS OF ATTENTION/CONCENTRATION

By

Kathryn V. Den Houter

A DISSERTATION

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
for the degree of

DOCTOR OF PHILOSOPHY

Department of Counseling, Educational Psychology,  
and Special Education

1988



9668059

## ABSTRACT

### CASE STUDIES OF A HYPERACTIVE CHILD AND A NONHYPERACTIVE CHILD: A LOOK AT THEIR PATTERNS OF ATTENTION/CONCENTRATION

By

Kathryn V. Den Houter

Success in the school environment is often determined by one's ability to attend and concentrate. Attentional deficits appear to be the root of many learning problems. Therefore, educators need to know how to change educational environments to enhance pupils' ability to attend/concentrate. This study was an attempt to understand the role of attention/concentration in the area of hyperactivity. This was done by comparing the patterns of attention/concentration between a hyperactive child and a nonhyperactive child. The unit of analysis was the child, and the study setting was the natural environment of an on-going classroom.

The criteria used to select the two subjects from the classroom of 12 pupils were IQ and hyperactivity. These selection variables were measured by the Wechsler Pre-School and Primary Scale of Intelligence and the School Situations Questionnaire. The variables used to determine inter- and intraindividual differences were locus of control, self-efficacy, and parental acceptance. The scales used to

Kathryn V. Den Houter

measure these variables were the Stanford Preschool Internal-External Scale, the Harter and Pike Scale of perceived competence and social acceptance, and the Porter Parental Acceptance Scale, respectively. The outcome variable was the patterns of attention/concentration of the hyperactive subject and the nonhyperactive subject. These patterns were measured using the On-task/Off-task Behavior Checklist, which accompanied five hours of classroom videotaping.

The test results and observations of the subjects in the study suggested that an individual's internal control and feelings of self-efficacy appear to increase persistence to task. Teachers can encourage on-task behaviors by offering the freedom to choose in the classroom, minimizing teacher interruptions, and providing complete and adequate instructional materials.

The major finding of this study was that Daric, the hyperactive subject, spent less time on-task than did Liza, the nonhyperactive subject. Although this difference was small, a large difference was found in the amount of change from on-task to off-task behaviors. The hyperactive youngster changed tasks more often than did the nonhyperactive child. Future research needs to focus on depth of task processing and task completion, rather than on on-task and off-task behaviors.

Dedicated to  
My husband, Len, and children,  
Jonathan, Jennifer, Jessica, and Benjamin,  
who were patient through this whole process.

## ACKNOWLEDGMENTS

Many different people have assisted me on this project. The children, the parents, and the parent board of Stepping Stones Montessori School were very supportive. Special thanks belongs to Mrs. Valenti, who let me use her video camera. Without their support, this effort would have been impossible.

I also deeply appreciate the time and effort displayed on my behalf by the members of my committee. Special thanks to Dr. Walter Hapkiewicz, who had the thankless job of reviewing the written copy. Also, sincere appreciation is given to Dr. Lawrence Schiamberg, who gave the initial direction; to Dr. Gary Stollak, who provided inspiration; and to Dr. Eugene Pernell, who insisted on a certain standard of excellence. They all provided valuable contributions and insights. Sincere appreciation is extended to Susan Cooley, my editor, who guided me through the steps toward completion of the dissertation.

Finally, I would like to acknowledge the cooperation and support of my family, who were able to survive a household run by someone preoccupied by the completion of this document. Special thanks to my husband, who kept the computer running and whose persistence was not unlike the "Hounds of Heaven."

## TABLE OF CONTENTS

	Page
LIST OF TABLES . . . . .	ix
LIST OF FIGURES . . . . .	x
Chapter	
I. INTRODUCTION TO THE STUDY . . . . .	1
Statement of the Problem . . . . .	1
Methodological Approach . . . . .	6
Purposes of the Study . . . . .	8
Definitions of Key Terms . . . . .	10
Overview . . . . .	11
II. RELATED RESEARCH AND THEORETICAL BACKGROUND . . . . .	13
Definitions of Attention/Concentration . . . . .	13
Selection Variables and Attn/Con . . . . .	22
Intelligence Quotient . . . . .	22
Hyperactivity . . . . .	23
Descriptive Variables: Factors Affecting . . . . .	39
Individual Differences . . . . .	39
Locus of Control and Attn/Con . . . . .	39
Perceived Competence and Social Acceptance . . . . .	43
Parental Acceptance . . . . .	49
The Outcome Variable . . . . .	51
Attention/Concentration . . . . .	51
Research Questions . . . . .	70
III. METHODOLOGY . . . . .	71
Procedures Followed in Conducting the Study . . . . .	71
Setting . . . . .	72
Overview of the Study Variables and Rationale for Their Selection . . . . .	73
Instrumentation . . . . .	78
The Student Situations Questionnaire and Conner's Teacher Rating Scale . . . . .	78
The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children . . . . .	79

	Page
The Stanford Preschool Internal-External Scale .	81
The Wechsler Preschool and Primary Scale of Intelligence . . . . .	83
The Porter Parental Acceptance Scale . . . . .	84
The On-Task/Off-Task Observation . . . . .	85
Subjects . . . . .	87
Procedure . . . . .	91
Limitations and Generalizability of the Study . . .	92
 IV. RESULTS AND DISCUSSION . . . . .	 94
Introduction . . . . .	94
Case Study 1: Daric . . . . .	95
Physical Description . . . . .	95
Family Background . . . . .	95
School Environment . . . . .	98
Skill Areas . . . . .	99
Activity Patterns and Patterns of Attention/ Concentration . . . . .	 101
Interactions With Others . . . . .	105
Classroom Behaviors . . . . .	106
Indicators of Self-Concept . . . . .	107
Coping Style and Response to Frustration . . . .	108
Summary . . . . .	108
Case Study 2: Liza . . . . .	109
Physical Description . . . . .	109
Family Background . . . . .	109
School Environment . . . . .	110
Skill Areas . . . . .	111
Activity Patterns and Patterns of Attention/ Concentration . . . . .	 112
Interactions With Others . . . . .	114
Classroom Behaviors . . . . .	118
Indicators of Self-Concept . . . . .	118
Coping Style and Response to Frustration . . . .	119
Summary . . . . .	119
Discussion: Comparison of Daric and Liza . . . . .	120
Physical Description . . . . .	120
Family Background . . . . .	120
School Environment . . . . .	122
Skill Areas . . . . .	122
Activity Patterns and Patterns of Attention/ Concentration . . . . .	 124
Interactions With Others . . . . .	133
Classroom Behavior . . . . .	134
Indicators of Self-Concept . . . . .	134
Coping Style and Response to Frustration . . . .	135

	Page
Relation of Findings to the Literature . . . . .	135
Related Findings . . . . .	137
V. SUMMARY, CONCLUSIONS, AND IMPLICATIONS . . . . .	143
Summary . . . . .	143
Conclusions . . . . .	144
Implications for Further Research . . . . .	146
APPENDICES	
A. THE SCHOOL SITUATIONS QUESTIONNAIRE . . . . .	150
B. CONNER'S TEACHER RATING SCALE . . . . .	151
C. THE PICTORIAL SCALE OF PERCEIVED COMPETENCE AND SOCIAL ACCEPTANCE FOR YOUNG CHILDREN INDIVIDUAL RECORDING AND SCORING SHEET, FORM 1-2 . . . . .	152
D. THE STANFORD PRESCHOOL INTERNAL-EXTERNAL SCALE (1) .	153
E. THE PORTER PARENTAL ACCEPTANCE SCALE . . . . .	155
F. ON-TASK/OFF-TASK OBSERVATION FORM . . . . .	160
REFERENCES . . . . .	161

## LIST OF TABLES

Table	Page
3.1 Results on the Wechsler Preschool and Primary Scale of Intelligence . . . . .	88
3.2 Results on the School Situations Questionnaire . . . .	89
3.3 Children's Scores on All Measures . . . . .	90
4.1 WPPSI Results for the Two Subjects, November 1985 . .	122
4.2 Changes in Orienting Activity . . . . .	131
4.3 Percentages of Time On-Task and Off-Task . . . . .	133



## LIST OF FIGURES

Figure	Page
2.1 Continuum of Attn/Con . . . . .	20
3.1 Variable Matrix . . . . .	77
4.1 Incidence of Daric's Task Change . . . . .	103
4.2 Incidence of Liza's Task Change . . . . .	115
4.3 Comparison of Liza's and Daric's Incidence of Task Change . . . . .	126
4.4 Comparison of Liza's and Daric's Incidence of On-Task and Off-Task Behavior . . . . .	130
4.5 Incidence of Task-Orientation Change . . . . .	131

## CHAPTER I

### INTRODUCTION TO THE STUDY

#### Statement of the Problem

A student's ability to attend/concentrate is an important determinant of his/her success in school. Currently, educators do not have enough information to help children who have problems attending/concentrating. Three educational issues are intimately related to attention/concentration. First, school achievement is notably affected by students' ability to attend/concentrate. Second, educators need to know how to change educational environments to enhance students' ability to attend/concentrate. Finally, attentional deficits appear to be the root of some learning problems.

First, students' school achievement is notably affected by their ability to attend/concentrate (hereafter referred to as attn/con). Gibson and Rader (1979) advanced a definition of what they called "attention," which suggests that the absorption and use of information is the critical element of attention. A student who possesses "good attention" is more likely to process information more efficiently to perform a classroom task than is a student without such attention.

Researchers have studied classroom subgroups of hyperactive, inattentive, and aggressive students. The results of one such study by Kupietz and Richardson (1978) supported the general hypothesis that performance is related to a child's ability to remain attentive in the classroom. Also, several researchers who have conducted distraction studies (Aman & Turbott, 1986; Dykman, Ackerman, & Holcomb, 1984; Rosenthal & Allen, 1980) have found strong evidence that learning disabled children had distinct problems with distractibility and that these students, when compared with normal students, correctly identified fewer events, responded with more false alarms, and responded to more competing irrelevant stimuli. Second, educators need to know how to change educational environments to enhance students' ability to attn/con. Wachs (1971), Wohlwill and Heft (1977), and Walker (1985) examined how overstimulation in the educational environment affects the developing child. Wachs's original cross-sectional results were as follows:

The evidence . . . does appear to indicate that the relationship of level of stimulation to development may be curvilinear rather than linear, and that the rate of psychological development may be a function of an optimal level of certain aspects of interaction with the environment. (p. 310)

Wachs also found that when background noise was greater, subjects had difficulty maintaining attn/con and obtained lower scores on problem-solving tasks and reading achievement. Environments with too much or too little stimulation appear to differ markedly from those with optimal conditions for development. Other research on

attn/con in the classroom has been focused on (a) alertness (optimum sensitivity and readiness to receive the environment, (b) selectivity (acts of scanning the environment to select the most salient dimensions and to focus on those features while excluding others), and (c) central processing.

Researchers who have studied alertness (the state of physiologic readiness) have maintained that when the task is varied and the learning situation is kept interesting, attention (directed focus using a ready or alert mind) is held (Brophy & Willis, 1981; Keele, 1978). Selectivity (in attentive behavior) is most likely to occur when aspects of a situation coincide with what experience tells the learner is important (Norman, 1976). Studies on central processing have presented further insights into learning in the classroom milieu. Niesser (1981) suggested that information processing takes place on two levels: preattentive and focal. Preattentive or automatic processing occurs when the stimulus is familiar, which in turn causes less invasion on the conscious. Focal information process takes time and mental effort. Automaticity is a major element in increasing the amount of central processing (Piontrowski & Calfee, 1979). Norman (1976) suggested that practice is the key element: "A general rule appears to be that when a skill is highly learned--perhaps because it has been practiced for years and years--then, it becomes automated, requiring little conscious awareness" (p. 65). These are just some of the studies that have shown how the environment affects the attn/con of

the individual. In essence, the learning environment does play a critical role in children's development.

Finally, attentional deficiencies and deficits in attn/con appear to be the root of many problems, including hyperactivity, learning disability, and emotional impairment. Typically, distraction studies have investigated the contention that hyperactive and learning disabled children are unable to screen out task-irrelevant simulation. In many of these studies, researchers presented distractions (ringing telephones, flashing lights, and conflicting colors) and noted a difference between hyperactive and learning disabled children's responses. Although studies have varied, there has been no overwhelming evidence showing that hyperactive children are easily distracted; in contrast, strong evidence has indicated that learning disabled children have distinct problems with distractibility. Researchers have discovered that learning disabled students, when compared with normal students, correctly identified fewer events, responded with more false alarms, and responded to more competing irrelevant stimuli (Aman & Turbott, 1986; Dykman et al., 1984; Rosenthal & Allen, 1980). Also, children with emotional impairment have shown signs of distractibility and an inability to sustain attention.

Rutschmann, Cornblatt, and Erichmeyer-Kimling (1977) conducted a study on emotional impairment and found significant differences over time between the control group and a group at risk for the emotional impairment of schizophrenia. These researchers administered the Continuous Performance Test to a group of children

at risk for schizophrenia. This risk was determined by the subjects' environmental backgrounds and their psychobiological development. The differences between the control group and the high-risk group were largely due to the high-risk group's poor discriminability and inability to sustain attention.

In summary, attentional deficits appear to be the source of many learning problems, including hyperactivity, learning disability, and emotional impairment. As a consequence, understanding attn/con could have a profound effect on learning problems and current educational settings.

Very little applied research has been conducted in the classroom setting to help understand attn/con and the role it plays in the learning process. Despite the importance of attn/con, insufficient remedies are available for children with difficulties in this area. The literature on the subject of attn/con contains a vast array of studies; these include investigations about vigilance, persistence to task, self-efficacy, and motivation. In addition, investigations that have been conducted on hyperactivity, eye movement, and incidental learning apply, in some respects, to the process of attn/con. The research on attn/con is long on variety and short on clarity. Research on the child who has difficulties with attn/con and productive remedies that can be used to alleviate these difficulties is especially lacking. Pertinent research is needed in these areas.

### Methodological Approach

The present researcher investigated attn/con in a classroom of 5 year olds. The unit of analysis was the child; the case study method was used. Two children were chosen from this classroom: one was hyperactive and the other nonhyperactive. From the review of literature, it was apparent that numerous laboratory studies have been done on attention. At this point in the development of research on attn/con, it seems that observational research might give a clearer picture of attn/con in terms of classroom behavior.

Direct observation was thought to be the best approach for such an investigation because it is an important part of the discovery process for both the teacher and the researcher (Irwin, 1980). First, observation generates ideas. Ethologist N. Blurton-Jones (1972) considered observation to be extremely important; not only does observation lend itself to productive hypotheses and ideas, but it ultimately saves research time. It is no accident that so many theories have been developed out of the researcher's own observations (e.g., Piaget, Freud, and Lorenz). Second, observational studies are important because they provide a means to answer specific questions. For example, Ainsworth (1973) wondered what effects maternal deprivation in infancy had on a child's later adjustment. She observed such factors as (a) age of infant at separation, (b) length of separation, and (c) the kinds of alternative care used. It would be difficult to obtain these types of information from a laboratory study. Ainsworth's observational

technique was helpful in answering her questions concerning those factors.

The third reason for using observation is that this technique yields a more realistic picture of behavior and events than do other techniques, such as laboratory experiments. Through direct observation, the observer looks at freely occurring behavior in the natural setting where there is nothing artificial or contrived. Therefore, the researcher might use the information gathered to predict what would happen, but that information could apply only to similar situations. It is difficult to generalize the findings of laboratory studies to the "real" world, where many "unplanned" factors intervene to influence behavior.

A fourth reason for using observation is to gain a better understanding of children's behavior. The researcher can observe how children interact with their world. For example, some children need to be shown how to mix yellow and blue to get green, others need only to be told how to do it, and still others need only to watch the process. Each child has his/her own learning style. At times, speaking in terms of averages and other statistical measures can be misleading. Observing individual children can provide insights into the child's behavior.

A fifth function of observation is evaluation (Irwin, 1980). Children are best evaluated through observation. Young children are often unable to read and write and, at times, are not able to understand adult verbalizations. Paper-and-pencil tests can be unreliable and are often not the best way to evaluate young



children. Hence, observation is often the best method for evaluating youngsters.

In the final analysis, direct observation appeared to be the best method for this study on attn/con. The age of the children and the ongoing nature of the classroom were conducive to direct observation. In this study, the unit of analysis was the child, but the classroom situation was noted as well. Direct observation was used with the intention of gaining further understanding of children and their ability to attn/con.

#### Purposes of the Study

The purposes of this research were as follows:

1. To clarify the issues involved with attn/con so that educators can help children with these problems because attentional difficulties are the source of some learning problems.

2. To aid teachers, parents, and school personnel through the information obtained on the relationship of locus of control and self-efficacy to on-task behaviors.

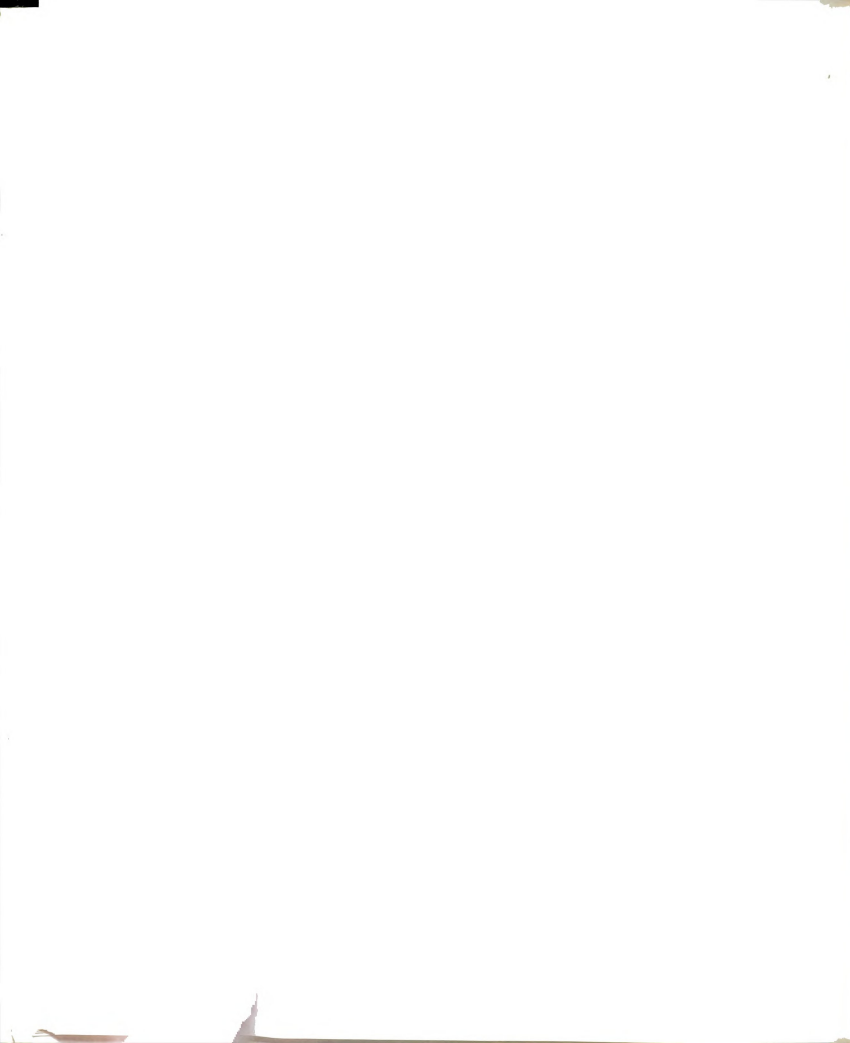
The researcher's primary purpose in conducting this study was to contribute to the current educational literature on attn/con. Many attempts have been made to clarify the concept of attention, but few have been pertinent or comprehensive. Investigations have been conducted on the issues of vigilance, persistence to task, self-efficacy, and motivation, some of which are tangential to attn/con. Research that is directly concerned with attn/con needs to be undertaken.



Another purpose of the study is to lay the groundwork for future research in this area. Some of the insights gained from this research, such as the need for researchers to focus on the depth of task processing and task completion, could spawn further research. Another area of interest is how the teacher is used in the classroom. Do hyperactive youngsters use their teacher differently than nonhyperactive pupils do? Research could also lay the groundwork for further studies on self-efficacy, persistence to task, or locus of control and their relationship to the depth of task processing.

In addition, it has been shown that problems with attn/con are the source of some learning difficulties. Investigating the problems of attn/con can help in understanding learning problems. Finally, educators, parents, and other school personnel may be aided by the information gained in this investigation. The classroom environment can be improved to enhance attn/con. Also, amounts of teacher intervention and medical intervention can be altered to attend more appropriately to the needs of the child with attentional deficits.

In summary, the primary purpose for pursuing this study was to contribute to the current educational research and to lay the groundwork for further investigations. Also, this research was intended to clarify some of the issues involved in attn/con because attentional problems are often the source of learning difficulties. Finally, the information gained from this research is intended to



help parents, educators, and medical personnel become familiar with some of the issues related to attn/con.

### Definitions of Key Terms

The following terms are defined in the context in which they are used in this dissertation.

Attention/concentration (attn/con). The initial task orientation that proceeds toward deep, intense concentration without external pressures or rewards.

Hyperactivity. A set of behaviors that has been described clinically as (a) distractibility (inability to persevere with homework and classroom assignments), (b) impulsivity (failure to think before one acts), and (c) excitability (having temper tantrums, fighting over trivial matters, and/or having a low tolerance for frustration). Secondary symptoms might include (a) antisocial behavior, (b) specific learning disabilities, and (c) some depressive symptoms that are exacerbated by low self-esteem.

Intelligence quotient. The IQ, as measured by the Wechsler Preschool and Primary Scale of Intelligence (WPPSI).

Interindividual differences. Differences in characteristics between one person and another or between one person and a group of individuals.

Intraindividual differences. Differences in characteristics within an individual.

Locus of control. The source of control as perceived by the individual. Actions and thoughts can come from internal directives (internal control) or from external forces (external control).

Parental acceptance. The feelings conveyed by the parent(s) to the child, which include regarding the child as a person with feelings and respecting the child's rights and need to express those feelings (Porter, 1954).

Perceived competence. An individual's perception of his/her capabilities.

Persistence to task. The ability to complete a chosen task.

Selective attention. The process of determining which stimulus will be attended to and which will not be attended to.

Self-efficacy. Includes the components of efficacy expectation and outcome expectation. Efficacy expectation is the conviction that one can successfully perform the behavior required to produce a particular outcome. Outcome expectation is a person's estimate that a given behavior will lead to a certain outcome.

Vigilance. A "watchkeeping" task or a focusing of attention on an activity.

### Overview

Chapter I contained a statement of the problem, the methodological approach used in the study, purposes of the research, and definitions of key terms. The related research and theoretical background of the study are presented in Chapter II. Areas of literature that were examined in relation to attn/con concerned IQ,



hyperactivity, perceived competence, self-efficacy, selective attention, vigilance, attentive behavior in the classroom, parental acceptance, and brain waves.

The methods used in gathering the data for the study are explained in Chapter III. The setting, subjects, measurement instruments, and limitations of the study are also discussed. The fourth chapter contains the case studies of Daric and Liza. At the end of the chapter, the two subjects are compared, and the results of the case studies are discussed. Chapter V includes a summary of the study, conclusions, and implications for further research.



## CHAPTER II

### RELATED RESEARCH AND THEORETICAL BACKGROUND

The review of literature in the field of attn/con includes many related areas. Because attn/con was the main topic of interest in this study, the chapter begins with a review of definitions of attn/con. The remaining sections are concerned with the variables of interest in this research project and their relationship to attn/con. These variables are IQ, hyperactivity, locus of control, perceived competence, and parental acceptance.

#### Definitions of Attention/Concentration

As early as 1890, William James wrote in Principles of Psychology, "My experience is what I agree to attend to" (p. 402). Since then, attention has been defined and redefined to help psychologists and educators understand the individual learning process. Binet (cited in Sattler, 1982) abandoned his initial theory of the development of intelligence (associationism) in favor of a theory suggesting that memory was influenced by attention and will. With this theory, Binet attempted to define attention as mental adaptation to a new situation. Virtually no clear, specific definitions of attention were proposed until recently, when relatively specific definitions of the concept have been advanced.

Gibson and Rader (1979) said that "good attention . . . refers to bringing our perception in line with our tasks by efficiently picking up information necessary to perform some task" (p. 71). This definition and other current explanations have claimed that attention is not a capacity that increases with age but, rather, that perception changes with increasing knowledge of one's self and the world, allowing one to pick up information more and more economically to perform specific tasks.

In an attempt to clarify the term "attention," Gibson and Rader delineated three types of attention:

1. Involuntary attention--an example is the infant who responds involuntarily to flashing or novel stimuli.
2. Self-directed voluntary attention--an example is the person who determines what he/she will attend to and how much time he/she will spend accomplishing a goal.
3. Other-directed attention--an example is the good but joyless student whose ego is so labile that he/she is easily guided into externally assigned tasks.

Although Collins and Hagen (1979) did not define attention specifically, they provided a descriptive analysis of the developmental process toward gaining attention. The first transition occurs from 8 to 12 months during infancy and is characterized by learned motor processes. Once these processes are incorporated in the perceptual act, the course of subsequent development of perception is set. During this time, the infant moves from unconscious to conscious perception. Salapatek (1975)



found that visual attention in the young infant is stimulus bound and focuses on parts rather than wholes. Also, by the third month, the infant exhibits a preference for novelty (Fantz, 1964). As the infant develops, greater neurological stability is established, and he/she gains more experience interacting with the environment. Consequently, the infant's orientation changes and conception determines his/her perception.

The second transition occurs more gradually over a period of years. It consists of a shift from inefficient, scattered processing to a more efficient processing that allows focused attention to be possible.

A task that is practiced for a sufficiently long period to become "automated" can be performed with little or no conscious attention, and whatever demands are placed on conscious processing resources tend to cause severe interferences with whatever other cognitive task is going on at the same time. (Norman & Babrow, 1976, p. 115)

In essence, scattered attention and inefficient processing are likely to be the norm until perceptual processing becomes well-practiced and largely automatic.

In recent years, substantial consideration has been given to attention. In the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-III), minimal brain dysfunction (MBD) has been renamed attention deficit disorder (ADD). The diagnostic criteria for ADD that have been established by the American Psychiatric Association are inattention, impulsivity, and hyperactivity. The problems begin before age 7 and last at least 6 months. The symptoms are often aggravated in situations in which

the child must work independently, such as in the classroom, but the symptoms are not always present. Following are the criteria used to define an attention deficit disorder with hyperactivity.

A. Inattention. At least three of the following:

1. Often fails to finish things he/she starts.
2. Often doesn't seem to listen.
3. Easily distracted.
4. Has difficulty concentrating on school work or other tasks requiring sustained attention.
5. Has difficulty sticking to a play activity.

B. Impulsivity. At least three of the following:

1. Often acts before thinking.
2. Shifts excessively from one activity to another.
3. Has difficulty organizing work.
4. Needs a lot of supervision.
5. Frequently calls out in class.
6. Has difficulty awaiting turn in games or group situations.

C. Hyperactivity. At least two of the following:

1. Runs about or climbs on things excessively.
2. Has difficulty sitting still or fidgets excessively.
3. Has difficulty staying seated.
4. Moves about excessively during sleep.
5. Is always "on the go" or acts as if "driven by a motor."

The definition of an ADD without hyperactivity includes all the features listed above, except the child is not hyperactive. In many

cases, attention problems and impulsivity are milder when there is no hyperactivity. Until recently, the primary emphasis has been placed on hyperactivity, but the importance of how the child attends is now being recognized. It has been suggested that ADD occurs in about 3% of all children. Such disorders, either with or without hyperactivity, are 8 to 10 times more common in boys than in girls (Friedman & Doyal, 1982).

The results of Wender, Reimherr, and Woods's (1981) study led to a change in criteria for the diagnosis of ADD, requiring in addition to the other criteria that subjects meet DSM-III criteria for this diagnosis in childhood because ADD is a relatively new label. Its identification and definition emphasize the importance of focused attention in daily functioning. This is just one of several indications of current research focus on attention. In all likelihood, this emphasis will continue with future research.

Palfrey (1981) advanced the emphasis on focused attention in daily functioning. She incorporated an activity-attention scale into the Pediatric Examination of Educational Readiness (PEER) instrument. This scale was designed to determine whether performance of age-appropriate tasks would elicit or provoke attentional weakness or activity level in a sample of pre-kindergarten children. During testing, Palfrey observed six attentional signs: (a) impulsivity-reflectivity (the extent to which a child jumped into a given task or paused to monitor his/her decision), (b) fidgetiness (e.g., overall small-muscle activity and minor body movements), (c) distractibility (the extent to which a



child was "called away" by auditory, visual, or other stimuli, (d) attentional continuance (the extent to which a given task could be pursued to completion), (e) attentional absences (the number of times a child's eyes and/or head moved away from the situation at hand), and (f) overactivity (physical disruption, major body movements).

Palfrey found significant differences on the PEER between children with and those without attentional weaknesses. The findings were striking for mastery skills (e.g., task persistence, use of time, routines, following directions), reading skills, and motor skills (e.g., catching a ball, dressing, tying shoelaces, using scissors and pencils). Children with attention-activity weaknesses seemed to have number skills comparable to those of the group without such weaknesses.

The relatively high concurrent and predictive validity of attentional findings from the PEER suggests that this is an important tool for developmentalists and pediatricians. Inter-observer reliability was tested with a sample of 150 children. Overall agreement was high (87%), reflecting the tendency of the observer and examiner to agree on children without problems. There was somewhat less agreement on children about whom there were concerns. The McCarthy Scales and Kindergarten Performance Profile were used to determine concurrent and predictive validity of PEER attention-activity observations. Analysis of the scores on the McCarthy Scales showed significant mean differences on the PEER





between children with and those without attentional weaknesses. This is one of the few scales directly concerned with attention-activity levels in children. There is an increasing demand for diagnostic precision in the assessment of children with attentional problems.

From the review of literature on attn/con, the researcher noted that certain constructs constitute the definitions of these terms. Attention is the initial phase of task orientation, which proceeds toward concentration when the conditions are right. Introducing his theory of reflective versus impulsive cognitive style, Kinsbourne and Caplan (1979) suggested that problem-solving activities have two elements: (a) initially, the individual enlists a task orientation when he/she focuses on the activity (attention), and (b) the individual processes the information necessary to proceed to completion. Kinsbourne referred to this as "concentration span."

Similarly, in the motivation literature, Maehr (1976) suggested five behavioral indices of motivation: (a) direction (the individual chooses to attend to one thing and not to another), (b) persistence (the individual concentrates on the same task or event for a greater or lesser period of time), (c) continuing motivation (there is an interruption and a spontaneous return to activity), (d) activity level (the individual appears busy), and (e) performance or a higher level of functioning. The first two indices, direction and persistence, show a strong similarity to Kinsbourne's task orientation and concentration span. In the present study, attention would be the initial phase, which, when given the right task-



processing variables, would lead to concentration. Attention and concentration, then, would be the anchor points of a continuum, as shown in Figure 2.1.

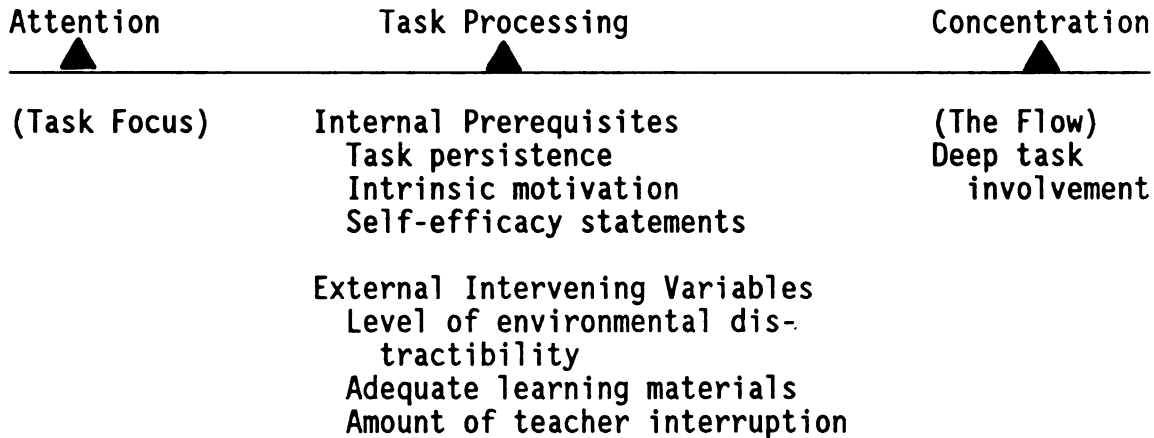


Figure 2.1: Continuum of attn/con.

Attention is the initial focusing on task, which leads to task processing and then to a deeper level of concentration. Such concentration has certain unique characteristics. Csikszentmihalyi (1975) used the term "flow," which he described as occurring

. . . when people experience direct, immediate rewards from engaging in the processes involved in activities: sense of control, clear perception of feedback, merging of thought and awareness, loss of self-consciousness, an intense feeling of enjoyment. These "flow" experiences typically occur during self-chosen recreational activities. (p. 36)

Graef, Csikszentmihalyi, and Giannino (cited in Csikszentmihalyi, 1961) also found that deep concentration can occur at work or in other compulsory settings.

Some researchers have found that self-chosen tasks enhance motivation and task persistence (Csikszentmihalyi, 1975; DeCharms,



1976; Maehr, 1969). Others have shown that deep concentration can also occur during compulsory activities (Graef et al., 1961). In the present study, voluntary, self-directed attention was investigated.

Several preceding and intervening variables influence attention progressing toward a deep concentration. These variables include (a) whether the task was self-chosen, (b) level of environmental distractibility, (c) individual persistence, (d) intrinsic motivation of the individual toward the task, (e) adequate learning materials, and (f) number of teacher interruptions. DeCharms (1976) found that, when learners chose their own tasks, there was greater task enjoyment and longer task engagement than when the tasks were chosen for them. Maehr (1976) also found greater task persistence for self-chosen tasks. Csikszentmihalyi (1975), as well, found that deep concentration typically occurred during self-chosen tasks. Wachs, Uzgiris, and McVickers-Hunt (1971) advanced the importance of minimal classroom distractions. He found that when background noise was greater, subjects had difficulty maintaining attention and obtained lower scores on problem-solving tasks and reading achievement. Researchers have found a marked difference in the performance of individuals in environments with too much or too little stimulation and those in surroundings with optimal conditions for development. Individual persistence also plays a key role in an individual's attention proceeding toward deep concentration. Bandura (1982), among others, showed that



individuals with a strong sense of self-efficacy make a greater effort to master the challenge and complete the task. Regarding intrinsic motivation, several theories have been advanced, suggesting that extrinsic rewards hamper intrinsic motivation (Deci & Ryan, 1985; Lepper, 1983). When external rewards were given for activities of high intrinsic interest and then withdrawn, the amount of time spent on the activity actually decreased.

In conclusion, attn/con can be defined theoretically as an initial task orientation that proceeds toward deep, intense concentration without external pressures or rewards.

#### Selection Variables and Attn/Con

##### Intelligence Quotient

In shaping the definition and description of hyperactivity, the relationship between intelligence (more specifically, IQ) and this disorder has been a subject of controversy. Some but not all hyperactive children have been found to have low IQs. Palkes and Stewart (1975) found that the WISC Full-Scale, Verbal, and Performance IQs were significantly lower for hyperactive children than for a matched group of normal children. However, when the group means of spelling, reading, and arithmetic scores on the Wide Range Achievement Tests were adjusted for WISC Full-Scale IQ, no significant differences were found between the scores of hyperactive and normal children. Palkes and Stewart concluded that hyperactive children learned at a rate that was normal for their measured intellectual performance. Leicht, O'Donnell, Phillips, and Marnett





(1984) used path analysis in a 4-year longitudinal study. They found that personality problems were best predicted by IQ, performance on the Bender Gestalt test, and previous personality problems.

Cantwell (1972) also conducted a study comparing a group of hyperactive children with a matched group of normal public school children. He used a regression equation technique to determine whether each normal and each hyperactive child was functioning above or below grade level in reading, spelling, and mathematics. Cantwell found that more than 75% of the hyperactive children were educationally retarded in each of these three subject areas. About 50% were behind more than one grade level. Cantwell's findings suggested that hyperactive children had difficulty with school achievement and appeared to have lower IQs than normal children but that the relationship between hyperactivity and IQ needed further investigation. In contrast to Cantwell's and Palkes and Stewart's findings, Minde et al. (1971) expressed guarded reactions about low intelligence being a main contributor to academic failure.

### Hyperactivity

More than a century ago, Heinrich Hoffman, a German physician, described hyperactivity in his poem about "fidgety Phil who couldn't sit still" (Cantwell, 1975). Since that time, such terms as "brain damage syndrome," "minimal brain damage," and "minimal brain dysfunction" have been used to describe hyperactivity. Use of these terms has had some unfortunate consequences because brain damage is



not always a part of hyperactivity. Since the early 1970s, the term "hyperactivity" has been used and describes the syndrome more accurately.

The study of hyperactivity has taken place in three distinct stages. The first period extended from 1902 to World War II. An English pediatrician by the name of Still (1902) presented a detailed description of children who were hyperactive as a result of gross lesions of the brain or other organic dysfunctions. In his sample, hyperactivity was more prevalent in boys than in girls, something Still did not find coincidental. Further, he thought hyperactivity was best treated by medication in a hospital and said the prognosis for complete recovery was fair to poor. In the early 1920s, after an outbreak of acute encephalitis, it was found that children who acquired the disease underwent a major personality change, becoming hyperactive, distractible, irritable, antisocial, and unmanageable in school. Thus, the hypothesis that hyperactivity was associated with some organic dysfunction or brain damage was perpetuated. Toward the end of this first period, Bradley (1939) prescribed benzedrine, an amphetamine, for emotionally disturbed children in an attempt to rid them of severe headaches by raising their blood pressure. To his surprise, some children became more interested in school work and appeared to have better work habits after receiving this medication. Numerous articles followed Bradley's discovery, dealing with the improvement in behavior following the use of stimulant medication.



The second period in the study of hyperactivity was from World War II to the mid-1960s. In this period, researchers found further support for the validity of a causative link between brain damage and hyperactivity. Particularly interesting were the ablation studies in animals (Cromwell, Baumeister, & Hawkins, 1963). Findings of these studies supported the association between hyperactivity and an interference in cerebral functioning. At that time, the term "minimal brain dysfunction" was in vogue, and researchers hypothesized that children who were labeled hyperactive were also probably brain damaged (Strauss & Kephart, 1955). During that period, special education techniques were almost nonexistent; this limited the treatment of the problem. In the mid-1950s, psychopharmacology was on the upswing, and there was renewed interest in using stimulant medication for problem children. Toward the end of this period (the mid-1960s), children with minimal brain dysfunction were treated with stimulant drugs and psychotherapy, and were given a favorable prognosis for the adolescent years.

The final period extends from the mid-1960s to the present. Hyperactivity is no longer viewed as a brain-damage syndrome, but rather as a complex spectrum of behaviors, with few cases involving brain damage. Psychoactive drugs are still the treatment of choice for the hyperactive child; however, some articulate spokesmen have argued against the use of drugs (Schrag & Divoky, 1975). The use of drugs to treat hyperactivity has become an issue of interest, and several critiques have emerged. Further, there is a strong trend toward mainstreaming the hyperactive child who has special needs.



This trend has been brought about by increasing demands that the school should fit the child, rather than the other way around. The medication issue and physical anomalies as indicators have been studied, and longitudinal research has advanced the knowledge regarding long-term effects of treatment. As a result of this intensive research, hyperactivity is now viewed as a behavioral problem rather than a medical one. Researchers have offered new insights into the etiology of hyperactivity and have established a new urgency for individualized therapy and education. Pertinent discoveries are discussed in the following review of literature on hyperactivity.

First, it is necessary to define hyperactivity. In the reports on hyperactivity, the following clinical description of the condition has consistently emerged: (a) distractibility (inability to persevere with homework and classroom assignments, (b) impulsivity (failure to think before one acts), and (c) excitability (having temper tantrums, fighting over trivial matters, or having a low tolerance for frustration). These symptoms are especially noticeable when a hyperactive child is in groups with other children (Barkley, 1982; O'Malley & Eisenberg, 1973). The foregoing characteristics are the cardinal symptoms of the syndrome. The following symptoms are also present in some cases: (a) antisocial (aggressive) behavior, (b) specific learning disabilities (i.e., problems with learning to read), and (c) some depressive symptoms that are exacerbated by low self-esteem (Cantwell, 1975).





Recent research findings on hyperactivity have shown the importance of the social factors that provide the context for treatment. In the case of hyperactive children, three social systems must cooperate if treatment is to be successful; these are (a) the medical system (the attending physician), (b) the educational system (the school), and (c) the home (parents). The attending physician is largely responsible for making the diagnosis and prescribing medication. The school is involved in helping the child's intellectual progress. The parents must ensure that the child's welfare is protected.

In general, adequate communication among the physician, the teacher, and the parents rarely takes place. Only 1 of the 12 teachers in Robin and Bosco's (1981) study reported talking with the doctor. In the classroom, however, the teachers reported frequent parent-teacher conferences, saying that they met with these parents an average of 4.9 times a year. Only 19% (7 of 36) of the teachers said they talked directly with the attending physician about effectiveness of the medication and changes in the hyperactive child's level of success in the classroom.

Robin and Bosco found the same disparity in the monitoring process as they found in diagnosis and identification. They sampled 42 parents, 37 teachers, and 37 physicians in a monitoring study. One of the questions they asked concerned medical check-ups. The researchers found that parents tended to report more frequent visits to the physician than the physicians themselves reported. Also, when subjects were asked who took responsibility for the medical

monitoring of the hyperactive child, 65% of the physicians said they did, whereas 63% of the parents said they did. Two-thirds of the physicians reported that they saw the child once a year or less frequently.

Another issue concerning individuals involved in the care of a hyperactive child is the "proximity-sensitivity relationship." Differences in these caregivers' attitudes have been noted (Robin & Bosco, 1981). Mothers have been found to be more favorable to treatment than fathers, practicing teachers more favorable than prospective teachers, and superintendents less favorable than teachers.

In studying the prevalence of hyperactivity in a sample of 5,212 elementary school (K-5) students, Whalen and Henker (1980) found that only about 1.19% of the population was considered hyperactive by all three social systems (home, school, and physician). Other studies that relied on teacher reports had different results. The U.S. Department of Health, Education, and Welfare in 1971 estimated that approximately 5% of elementary school children in the United States were considered hyperactive (O'Leary, 1984). This figure has generally been confirmed by investigators in Australia, China, Germany, South Africa, and New Zealand (O'Leary, 1984). The criterion used in these investigations was one of extremity. That is, if a child scored in the upper 5% of the population in terms of activity level, he/she was defined as

hyperactive. Accurate sampling and statistics on the prevalence of hyperactivity are sorely needed.

Researchers have found that substantially more males than females are labeled hyperactive. Whalen and Henker (1980) and Cantwell (1975) found that the boy/girl ratio varied from 4:1 to 9:1. Some speculations about this dramatic discrepancy have given rise to theories about a sex-linked genetic cause of hyperactivity and examinations of the presumed "feminine" orientation of the school environment.

The hyperactive child is generally brought to professional attention early in the elementary school years. Careful questioning usually reveals that symptoms have been present from early childhood (Cantwell, 1975). Bradley (1957) reported a marked decrease in hyperactivity with maturation. Likewise, Laufer and Denhoff (1957) reported that hyperactivity tended to wane and spontaneously disappear between the ages of 8 and 18. These findings were supported by other investigators, as well (Bakwin & Bakwin, 1966; Cromwell et al., 1963; Huessey & Cohen, 1976). Currently, however, clinicians are discovering that the disappearance of high activity levels in adolescence does not always alleviate the remaining problems of low educational achievement and poor social-emotional adjustment (Wallander, 1988).

Some of the etiological factors in hyperactivity that have been examined include heredity, organic factors, physiological sensitivity, psychological aspects, and environmental factors (lead, fluorescent lighting, and diet). Heredity is often considered the

cause of hyperactivity. Comparisons of natural and adoptive parents of hyperactive children have shown that more natural than adoptive parents had been considered hyperactive as children (Cantwell, 1972).

Some of the earliest writers on hyperactivity (Ebaugh, 1923; Still, 1902) attributed the condition to brain damage that occurred as a result of prenatal/perinatal difficulties or a severe illness. However, when the subject criterion was hyperactivity, a higher incidence of minor abnormalities was found in the experimental groups than in the normal control children (Firestone & Peters, 1983). Brain-dysfunction theories are based on models that emphasize the interaction of the excitatory and inhibitory systems within the central nervous system. Wender (1971) advanced the most comprehensive theory using this framework. The increased arousal in the hyperactive child has been attributed to an abnormality in the metabolism of the monoamines (serotonin, noradrenaline, and dopamine), with a consequent deficiency in the inhibitory system (Ross & Ross, 1976). If the excitatory system is at a higher level, the child is more active; if the inhibitory system is at a higher level, the child is more controlled. Giving therapeutic doses of amphetamines increases the activity of the inhibitory system, which, in turn, calms the hyperactive child. Wender cited as a support for his theories a research study done with rats, in which monoamines increased progressively with age. This finding might help explain why the hyperactive child's activity level decreases with age.



Some investigators have considered the delayed-maturation approach an alternative to the brain-dysfunction approach (Abrams, 1968; Bax, 1972). Some researchers have made a case for physiological immaturity, suggesting that this factor be considered in the educational setting when making individual planning determinations. On a psychological measure of impulsivity, Weithorn (1970) found greater similarities between older hyperactive boys and younger nonhyperactive boys than between same-age hyperactive and nonhyperactive boys. Support for the delayed-maturation theory was provided by Butler and Lapierre (1974), who compared 6- to 12-year-old hyperactive children with a normal control group on the Illinois Test of Psycholinguistic Abilities. The researchers found that children in the hyperactive group were from 18 to 24 months less mature than those in the control group.

Environmental factors that affect hyperactivity are also worth considering. Some of the most interesting research has been done in this area and has been concerned with lead poisoning, fluorescent lighting, and food additives. Lead poisoning in children was first described in 1926, when Aub, Fairhill, Minor, and Resnikoff published a monograph on the diagnosis and treatment of this syndrome. Today, lead poisoning is usually caused by eating lead-pigment paints often found in deteriorating urban houses. A chip of paint the size of a penny can contain between 50 and 100 mg of lead. For some children, eating a few paint chips a day over a 3-month period can be fatal. Another source of lead is high-octane

gasoline, which emits lead into the atmosphere. Inner-city and suburban children may inhale lead from this source.

David, Clark, and Voeller (1972) established that children with elevated body-lead exhibited hyperactive patterns of behavior. This finding confirmed their hypothesis that there was a relationship between hyperactivity and increased stores of body-lead.

Neddleman and his colleagues (1979) collected the baby teeth of a large sample of children and analyzed the teeth chemically for lead content. The researchers found that the amount of lead content was directly related to the children's level of disruptive behavior, such as aggression and lack of attention in school.

Fluorescent lighting, which is typically used in schools, can be harmful because it gives off soft X-rays through the cathode ray guns at the ends of the fluorescent tubes. Thus, fluorescent lighting may be an environmental stressor that indirectly causes hyperactivity. Frey (1965) found that animals experienced behavioral changes following repeated exposure to radio and television frequencies. Also, in Harlley's study (1974) rats that were placed in front of a color television set with unshielded cathode tubes became hyperactive within 3 to 10 days; they remained hyperactive until the thirtieth day of radiation exposure, after which they became lethargic and died.

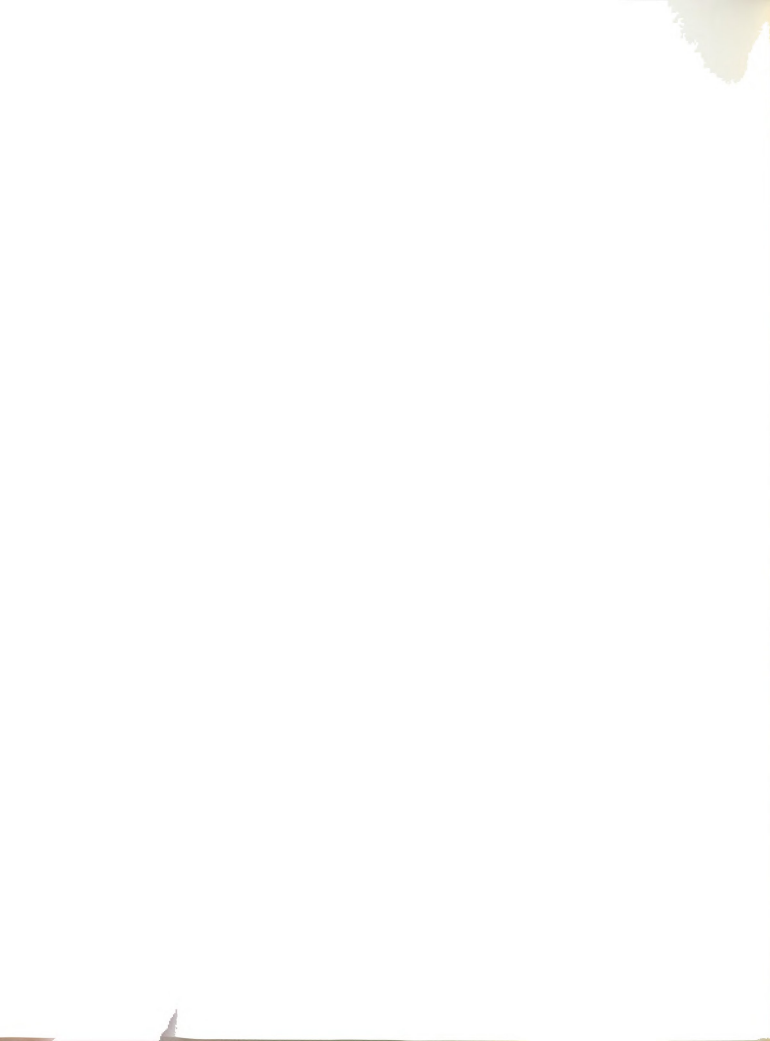
Food additives and other dietary factors are environmental stressors that are now being carefully scrutinized. Moyer (1975) advanced a theory that might explain the physiological cause of behavioral reactions. He said that allergens directly affect the





CNS by causing a noninflammatory swelling in the brain, especially in the neural connections controlling aggression, which makes these areas more sensitive to stimulation. Feingold (1975) has been an active proponent of the food-additive explanation for hyperactivity and learning disabilities. When Feingold placed 194 hyperactive children on diets free of additives, 58 children showed what the researcher termed dramatic improvement and 35 responded favorably. About half of the youngsters were able to discontinue stimulants and other medications within 10 days. The rapidity of the response to Feingold's diet appeared to be a function of age. The younger the child, the more rapid and complete the improvement. In 1980, Connors conducted several studies on the Feingold diet. He concluded that there might be some truth to Feingold's hypothesis but that it was not consistent across the hyperactive population. Bennett and Sherman (1983) and Milich and Pelham (1986) arrived at the same conclusion.

Another environmental stressor that merits consideration is maternal smoking and drinking. Researchers have determined that maternal smoking and drinking during pregnancy cause obstetrical complications, some of which are so severe that they can lead to fetal anoxia and consequent brain damage. Denson, Nanson, and McWatters (1975) conducted a study using three groups of 20 subjects each. The first group had been diagnosed as hyperactive, dyslexic children formed the second group, and normal controls formed the third group. Mothers of the hyperactive children had smoked



heavily during and after pregnancy, and their maximum daily consumption of alcohol at the time of the study exceeded that of the other two groups. In a series of reports, Jones, Smith, Streissguth, and Myrianthopoulos (1974) implicated maternal drinking as being linked to hyperactivity in children.

The last environmental stressor to be discussed is environmental constraints, primarily the lack of green space for children who live in housing with virtually no recreational outlets. Also, because of overcrowded apartments and schools, parents often fear for their children's safety. This combination of fear and lack of recreational facilities causes parents to keep their children indoors as much as possible. Characteristic of inadequate physical outlets is a pattern of behavior described as hyperactivity, attention inadequacy, lethargy, and indifference (McNamara, 1972).

In summary, much research has been done on the etiology of hyperactivity. Some results have been useful and others purely speculative in nature. The main direction of the research has been to study physiological and genetic etiologies, psychological causes, and environmental stressors. Much of the physiological research has concerned (a) organic dysfunction and its effect on hyperactivity, (b) the testing of theories to explain the actual physical processes that occur which cause the symptomatology of hyperactivity, and (c) the outcome and side effects of various drug therapies. Genetic researchers have examined the connection between parents' genetic uniqueness and family patterns and the hyperactivity of offspring. Research on psychological causes has involved evaluating home

environments and child-rearing practices and their relationship to hyperactivity. The most innovative research has involved examining such environmental stressors as fluorescent lighting, lead poisoning, food additives and diet, maternal drinking and smoking, and a constrained nonrecreational environment.

Rating scales. Rating scales play an important part in the diagnosis of hyperactivity. Such ratings also (a) help differentiate between hyperactivity and a level of activity that is at the extreme end of the normal range, (b) help identify the primary targets for change in the child's behavior, and (c) help determine the child's areas of strength (Ross & Ross, 1976). Many rating scales are available. Some scales that use parental ratings are the Werry-Weiss-Peters Activity Scale (1968), Connors's Parent's Questionnaire (1978), and the Behavior Problem Checklist (Quay & Peterson, 1967). Several teacher rating scales, such as Connors's Teacher Rating Scale and Connors's Abbreviated Teacher Rating Scale, are also available. These scales are often used to assess children's being considered for special education and other remedial services (Cohen, DuRant, & Cook, 1988). Parent and teacher rating scales can provide immediate information, a basis for planning management programs, and baseline data for subsequent evaluations of any intervention that is used.

In addition to the rating scales that are used to assess behavior, a number of mechanical devices have been developed to measure activity levels. With the kinetometer approach, a pedometer

is attached to the subject's legs and measures the number of leg movements. The actometer is used to measure vertical and horizontal axes to determine the angle of movements. The fidgetometer measures the amount of vibration that occurs when the subject moves on the surface of something, such as a chair. Sprague and Toppe (1966) developed the stabilimetric chair, which has a small cushion that records movements of 1/10 inch in any direction. In addition, traversal measures can be used; these include overhead filming, photoelectric equipment, ultrasonic generators, and radio telemetry, all of which measure and record subjects' physical activity.

Treatment. Treatment programs for hyperactive children have undergone some changes over the years. Hyperactivity is now viewed as a behavioral rather than a medical problem. The disease model has lost some appeal, and monitoring through behavior modification appears to be gaining interest. Generally, however, drug therapy still appears to be the treatment of choice in the medical profession. About 600,000 to 700,000 children in the United States received psychostimulant drugs for hyperactivity during the school year in 1983 (O'Leary, 1984).

The medication most frequently used for hyperactivity is Ritalin (trade name)/Methylphenidate (chemical name), which is used in about 82% of the cases because it takes effect almost immediately (about 30 minutes after ingestion). The second most frequently used medication is Dexedrine (trade name)/Dextroamphetamine (chemical name), which is used approximately 9% of the time. About 3% of hyperactive children receive tranquilizers such as Wellaril

(Thioridazene) or Thorzene (Chlorpromazene). Tranquilizers reduce restlessness but impair the child's attention span. Consequently, their use is usually restricted to children with severe emotional problems.

The most striking effect of hyperactivity medication is seen in the motor performance of hyperactive children (i.e., handwriting). Positive changes in social behaviors in the classroom have also been observed. Sleator and Von Neumann (1974) found a distinct relationship between dosage of medication and social behavior in the classroom. They measured the child's social behavior using Conner's Teacher Rating Scale. As the level of medication was increased, the child's behavior problem decreased.

Research has been conducted to determine whether psychostimulant drugs are addictive. Kramer and Loney (1982) and Gadow and Sprague (1980) found that adolescents who received psychostimulants as children were no more likely to depend heavily on drugs than were adolescents in the general population.

The three psychological treatments for hyperactivity that have been most successful are (a) behavior therapy, (b) cognitive therapy, and (c) psychotherapy. Behavior therapy came to the fore in the mid-1960s. Gerald Patterson, a pioneer in the treatment of aggressive children, advocated rewarding desired behavior, ignoring undesired behavior, and punishing undesired behavior. Although most of Patterson's work has been done with aggressive children, there is evidence that conflict in the homes of hyperactive children can be

reduced by using a behavior-therapy approach (Dubey, O'Leary, & Kaufman, 1983). Problems of aggression and hyperactivity in the home have clearly diminished with behavior therapy, and there has been evidence that the treatment effects persist. Better communication and better use of rewards, punishment, and reasoning can lead to a decrease in undesired behavior and an increase in rewardable behavior.

In cognitive therapy, another mode of therapeutic intervention, four methods are used: (a) self-verbalization, (b) modeling, (c) self-monitoring, and (d) self-reinforcement. Self-verbalizations are statements children make to themselves that guide and act as a controlling function over impulsive tendencies. Through self-verbalizations, children may also exhort themselves to remain alert or to persevere in the face of difficulties. Modeling is another effective technique because children's attention is more likely to be captured by a trainer who acts rather than by one who simply lectures. Self-monitoring means evaluating one's own productions from time to time. Self-reinforcement is another valuable component of cognitive therapy, whereby children virtually administer their own rewards. This helps them develop independent participation in the learning process, and they will probably develop a clearer understanding of the contingencies being taught.

Whalen and Henker (1980) investigated the training and outcomes of cognitive therapy. Their sample comprised 15 subjects between the ages of 6 and 10 years whose IQs were in the average or above-average range. After the researchers administered training tests



(story-completion tests involving frustrating events), they found that the cognitive training approach was very helpful in teaching children who had been labeled hyperactive.

One type of psychotherapy used with children is play therapy, which appears to be a relatively effective treatment for hyperactivity. The child regularly visits the therapist and the play therapy room and is free to play with the materials, talk, or do whatever he/she chooses. The therapist establishes only those limitations necessary to protect the play materials, room, child, and therapist. The therapist reflects the child's feelings back to the child and strives to convey respect and acceptance to the child. According to play therapists, children do not need to realize they have a problem before they can benefit from this type of therapy.

#### Descriptive Variables: Factors Affecting Individual Differences

##### Locus of Control and Attn/Con

Researchers have shown considerable interest in the role of locus of control and attributional processes and persistence to task (Weiner, 1972, 1984; Weiner & Kukla, 1970). Investigation of internal-external locus of control was initiated by Rotter (1954). Such research usually involved two treatment groups. When one group was told that ability only would determine success, no difference was found between subjects scoring high and low on a test measuring need for achievement. When the other group was told that success depended on both ability and effort, a difference emerged between

individuals scoring high and low on need for achievement (Henry, 1979). When effort was part of the modus operandi, those with a high need for achievement produced more than individuals with a low need for achievement. Lefcourt (1982) considered labeling individuals as "internals" or "externals" in terms of locus of control too simplistic an approach. Instead of labeling people in such a fashion, he suggested that locus of control be viewed on a continuum. The amount of control would be relative, depending on interest and particular situations.

Seligman (1984) presented a convincing case for his hypothesis on learned helplessness, which has an effect on one's locus of control. He claimed that helplessness is the psychological state that frequently results when events are uncontrollable--when nothing one does matters. In his research, Seligman used constructs similar to those used in Pavlovian conditioning. He and his colleagues discovered quite by accident that dogs who were given repeated inescapable shocks had unique reactions. At first, they struggled a bit; then, after a few seconds, they seemed to give up and to accept the shock passively. On all succeeding trials, the dogs failed to escape. Laboratory evidence has shown that when an organism has experienced trauma it cannot control, its motivation to respond in the face of later trauma wanes. Even if the organism does respond, it has trouble learning, perceiving, and believing that the response worked. Finally, its emotional balance is disturbed.

Recently, a number of studies have been conducted on learned helplessness. Passivity to stimuli ensues when the individual

perceives him/herself to be out of control and has an instructional "set" of chance and luck rather than skill. Such perceptions become deterrents to motivation and curb the persistence to goal attainment. Rholes, Blackwell, Jordon, and Walters (1980) undertook a developmental study of learned helplessness. They found that younger children were less susceptible to learned helplessness than were older children. This finding might suggest that younger children did not view failure as implying stable limitations on their performance. Research on learned helplessness has been used to explain the behavior of minority children (Pernell, 1984) and the concept of teacher burnout (Greer & Wethered, 1984).

Hiroto (1974) replicated Seligman's study on dogs, but instead he used college students for the sample. Half of the subjects were told that their performance on a particular task was due to skill; the other half were told that their score was governed by chance. Subjects who believed their score was governed by chance responded more helplessly than those who thought their performance depended on skill. Hiroto included the personality dimensions of external versus internal locus of control in his design. Half of the students in the study were externals--those who believe, as evidenced by answers on a personality inventory, that reinforcements occur in their lives by chance or luck and are not within their control. The other half were internals--those who believe they control their own reinforcers and that skill will determine those

reinforcers. Hiroto found that, in his experiment, externals became helpless more easily than internals.

Weiner (1984) considered the guiding principle of attribution theory to be that the individual searches for understanding and, in so doing, strives to find the causative source for both affiliative and achievement situations. The individual attempts to determine whether he/she can or cannot control particular life situations. Also, Weiner suggested that perceived determinants influence behavior and behavior change. The categories for attribution might be thought of in terms of locus of control and stability. Effort and ability are internal because they can be controlled by the individual. Luck and task difficulty are out of the individual's control and in someone else's hands. Ability and task difficulty remain stable, whereas luck and effort are factors that change over time.

DeCharms (1976) showed that those contextual conditions that communicate to persons that they are "origins" (internals) rather than "pawns" (externals) increase their achievement motivation. His research

. . . started with the notion that people differ along a dimension from Origin to Pawn and that the basic concept underlying the dimension was relevant to motivation. A Pawn would be at most externally motivated, while an Origin would be internally motivated. Quite frankly, it seemed that to be an Origin was better than to be a Pawn. (DeCharms, 1976, p. 3)

Origin and Pawn are two motivational states that are basic to personal causation. An Origin feels in control of his/her fate, whereas the Pawn believes he/she is controlled by someone or

something else. Individuals are not always Pawns, nor are they always Origins because situational constraints are present. Yet people appear to be characteristically one or the other, which could imply personal predispositions toward Origin or Pawn motivational states. Maehr and Stallings (1972) pointed out that freedom from external control in learning may encourage a continuing interest in and a greater willingness to engage in challenging tasks.

In summary, the motivational literature has played an important role in illuminating the cognitive and behavioral causes of attn/con. Weiner's writings on attributional processes, Rotter's and Lefcourt's research on locus of control, and Seligman's and Hiroto's writings on learned helplessness illuminate how the external personality and perceived lack of control influence motivation and persistence to task. DeCharms in his Origin-Pawn theory and Maehr in his theory of personal investment emphasized (a) the importance of the individual's sense of internal control, (b) relativity of motivation depending on the learner's interest and particular situations, and (c) the role of intrinsic motivation in one's persistence to task.

#### Perceived Competence and Social Acceptance

Perceived competence/persistence to task. Some ethnographic, cross-cultural studies regarding cultural values such as persistence to task have recently been conducted. In one such study, Shigaki (1983) gathered data throughout a year. Included in her study were 14 different Japanese nursery schools that were comparable to

American day care centers. Subjects were from 4 months to 6 years of age. A full-time participant-observer observed most of the nurseries for a full week. When the Japanese teachers were asked what kind of child they were trying to nurture, the amount of general consensus was amazing. The following four attribute clusters were ranked as most important:

1. Sympathetic-empathetic: gentle, socially conscious, kind, cooperative
2. Patient, persevering, ability to concentrate
3. Creativity
4. Inquiring, studious, thinking faculty

The second cluster of attributes, perseverance and concentration, was the most relevant to the present study.

In her study of the mother-child relationship in Japan, Lanham (cited in Shigaki, 1983) pointed out a unique feature of this relationship that might contribute to the child's achievement. This is "the mother's insistence that concentrated attention be devoted to the task at hand" (p. 324). Also, in an essay about the Japanese culture that illustrated the relationship between persistence and competence as it leads to eventual expertise, Morsbach (1978) wrote:

In order to master any worthwhile skills, the Japanese commonly expect that it will take many years of intensive teaching. A short cut, much beloved by Westerners, is seen as intrinsically harmful because it is precisely the persistence needed on the way to the goal which makes it all worthwhile. (p. 7)

Further observations made in the Japanese nursery schools indicated that persistence is a cultural value and that it is

cultivated from infancy (Shigaki, 1983). Mothers often let their toddlers struggle before stepping in to solve their "problems." Also, caregivers exhibited sensitivity to the child's persistence and intervened only when necessary before frustration set in. Such action reinforced the children's sustained efforts. Shigaki also observed that the 4 year olds had a long attention span, unlike many of their American counterparts. Caudill (1972) suggested that this difference in attention spans might stem from varied child-rearing practices in the two countries. Compared to her American counterpart, the Japanese mother is slower and more leisurely while caretaking, and her periods of caretaking are fewer and longer. As well, the daily schedule in Japanese nurseries includes large blocks of uninterrupted time.

Two research studies supported the importance of large blocks of uninterrupted time in elementary school classrooms (Farnham-Diggory & Ramsey, 1971; Nelson-Le Gall & Scott-Jones, 1983). One such study was conducted at Carnegie-Mellon on the effects of interruptions on play persistence (Farnham-Diggory & Ramsey, 1971). Fifty-six black 5-year-old girls were randomly assigned to one of four 10-minute treatments: Children in Group I were permitted to play freely with toys and puzzles. Those in Group II were allowed to play freely, but the toys were defective (i.e., pieces were missing, paint was dried out, and so on). Children in Group III played with good toys but were constantly interrupted by the experimenter, and children in Group IV were given social reinforcement on the same schedule as the interruptions. Following

these 10-minute treatments, the subjects were invited to play as long as they wanted without interruptions. The researchers found that interruption reduced subsequent persistence by about half. Nelson-Le Gall and Scott Jones (1983) corroborated this finding. These two studies refer to the external environment (i.e., the classroom). Another area of research has used the Zeigarnik paradigm (cited in Maehr, 1976), which refers to an individual's need to complete tasks or to achieve closure.

Intrinsic and extrinsic rewards can affect persistence to task both negatively and positively. Researchers have found that external reinforcement can actually undermine children's intrinsic motivation (Lepper, 1983). Lepper found that children who were rewarded for drawing lost their interest in drawing when the reward was withdrawn. Children who were never rewarded for their efforts maintained their interest in drawing. Condry (1977) clarified the specifics of the reward situation, suggesting that the negative effect occurs only for tasks that children are likely to do spontaneously. He claimed that some tasks are so unappealing and unchallenging that external reinforcement may be necessary. Also, informative praise for optimal performance has no negative effects.

Recent studies of the effects of rewards on intrinsic motivation have had similar structures. First, a base rate of intrinsic motivation was either measured or assumed. This base rate measured the amount of intrinsic motivation or willingness of the subject to do a task when there was no pressure to do so. Second,



the experimental intervention was introduced; this usually involved a reward. Any change in the level of interest from the first to the second measure was taken as the primary dependent measure of the effect of the reward on motivation. Using that format, Deci (1985) found that (a) when money was used as an external reward, intrinsic motivation tended to decrease, and (b) when verbal reinforcement was used, intrinsic motivation tended to increase. Persons with high intrinsic motivation might be expected to concentrate on the task at hand and therefore to exhibit superior task performance. Extrinsically motivated individuals, however, focus on attaining the goal, and this results in a poorer quality of task performance because the subject is preoccupied with the reward.

Perceived competence/self-efficacy. Bandura (1986) developed a self-efficacy theory to help predict and explain behavioral change. Two variables Bandura believed affect an individual's motivation to change are efficacy expectation and outcome expectation, which he defined as follows: Efficacy expectation is the conviction that one can successfully perform the behavior required to produce the outcome. Outcome expectation is a person's estimate that a given behavior will lead to a certain outcome. The key element of Bandura's theory is that the strength of a person's perception about his/her self-efficacy and expectations for treatment outcomes directly affect the amount and direction of the behavioral change.

In discussing the developmental sequence of self-efficacy, Bandura (1981) wrote, "The experiences arising from children's commerce with their environment provide the initial basis for

development of a sense of personal efficacy" (p. 211). By waving rattles and crying to bring adults, infants develop a sense of affecting the environment. They are becoming aware that they can make events occur. Active interaction between the infant and his/her environment fosters competence. Conversely, when an infant cannot arouse a response in the environment, his/her responsiveness is depressed and competence impaired. Later, during language acquisition, children develop a symbolic means to reflect on their activities. Initially, efficacy experiences are rooted in the family, but with increasing age, peers assume a greater role. Eventually, school becomes an agent for furthering or debilitating a sense of self-efficacy. Finally, in adulthood, intimate relationships, parenthood, and a career reinforce one's feelings of self-efficacy.

How do locus of control and self-efficacy relate to the development of attn/con in young children? They are important because a child's work habits in the classroom foster the development of concentration span. It is very possible that these factors influence the length and intensity of the child's ability to concentrate. Basic skills and a strong sense of self-efficacy appear to enhance one's ability to attn/con. "When beset with difficulties, people who entertain serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenge" (Bandura, 1982, p. 211).

### Parental Acceptance

Certain psychological factors have also been associated with hyperactivity. Bettelheim (1973) proposed that some children might be predisposed to hyperactivity because of physical make-up; when stressed by environmental pressures, they react with hyperactivity. Bettelheim went on to describe an unhappy dyadic relationship in which normal infants become restless and cranky because their mothers are impatient with or resentful of the trouble the infant causes them. The infant "fights back" through restlessness and resistance and becomes unable to cope with the mother's demands for quiet, compliant behavior. The youngster then moves chaotically through the preschool years. As the mother becomes increasingly anxious about the child's ability to adjust to school, she conveys her anxiety to the child directly and indirectly. The child sees him/herself as more and more of a problem, and his/her self-concept further deteriorates. The demands in the school for conformity, especially inhibition of motor movements, are often far beyond the child's capacity, and too soon teacher and peers label him/her as a failure. Bettelheim portrayed such a child as "driven" into a state of hyperactivity and advocated more warmth and acceptance on the part of women in the youngster's environment.

There has been a plethora of research to support Bettelheim's theory. Gelfand (1973) studied two groups of children with minimal brain dysfunction. In one group, children were required to perform the experimental task in the presence of their mothers. In the

other group, children performed the task in the presence of the experimenter, who encouraged them in a warm, accepting climate. Gelfand's hypothesis that children would perform better with the experimenter was confirmed. Youngsters showed greater task absorption and more exuberance with the experimenter than with their mothers.

Battle and Lacey (1973) reported correlates of hyperactivity in boys who participated in the Fels Longitudinal Study. The mothers of hyperactive male infants were critical of their difficult babies during infancy and were disapproving during later preschool years; these boys had much difficulty adapting to school.

Cantwell (1972) studied 50 nonretarded hyperactive boys from intact, two-parent families and 50 normal control boys from intact families. Forty-five percent of the patients' parents and 18% of the normal controls' parents were psychiatrically diagnosable. Paternal alcoholism, sociopathy, and maternal hysteria were among the psychiatric problems presented. Morrison and Stewart's (1971) results were similar. They reported that 33% of the patients' parents were psychiatrically diagnosable, based on the information gained from structured interviews. Only 16% of the controls' (normals) parents had presented psychiatric problems.

Paternite, Loney, and Longhorne (1976) examined relationships between hyperkinetic symptomatology and several parenting variables, along with socioeconomic status (SES) and parental reports of shortcomings. Ratings were done for six primary symptoms (high activity level, fidgetiness, inattention, judgment deficits,

negative affect, and uncoordination) and three secondary symptoms (aggressive interpersonal behavior, control deficits, and self-esteem deficits). In a series of multiple-regression analyses, Paternite et al. found that the most important independent predictors for the three secondary symptoms were parenting variables rather than SES. Generally, for all the symptoms, the researchers suggested that SES and parenting style may be related to hyperkinesis in very important ways.

Numerous researchers have examined the relationship between the home environment and the diagnosis of hyperactivity. Over the last 15 years, the results of such research have shown a marked relationship between the home environment/parenting variables and the diagnosis of hyperactivity. Thus, when determining treatment for the hyperactive child, the home environment needs to be considered.

### The Outcome Variable

#### Attention/Concentration

Literature on the topic of attention/concentration covers many related areas. Attention might be the keystone to help researchers understand these tangential topics. Of the vast array of literature, the following subareas are discussed in this section: (a) selective attention, (b) vigilance, (c) attentive behavior in the classroom, and (d) brain waves and biofeedback.

Selective attention. Selective attention refers to the stimulus chosen for detailed processing. Basically, the questions

that researchers on this area ask are: Which information does the perceiver register? What information will an individual retain?

One procedure that researchers on selective attention use is having a child make paired comparisons between things that are "the same" and "not the same." An Eye Movement Recorder is used to measure how the stimulus was seen (Mackworth, cited in Warm, 1984). This camera has a wide-angle lens with a silvered mirror placed at a 45-degree angle. The mirror reflects the subjects' eyes into the lens of a 16 mm movie camera. In one such eye-movement study, Vurpillot and Ball (1979) found that younger children scanned only a limited region before making their judgments of same or different, whereas older children tended to inspect the entire stimulus before making a judgment. In brief, older children were more thorough in their visual scanning. For both age groups (4 to 5 years and 6 to 7 years), the total number of eye movements decreased with each succeeding trial. The researcher also noted individual differences among children 4 to 9 years of age. Some children found it necessary to scan the stimulus exhaustively; this exhaustive search appeared to increase with age.

In summary, children's criteria for identification seemed to change with age from one based on a global impression of similarity to one having a clearer, more accurate conception of internal details. Age-related improvement in scanning strategies thus resulted from developmental changes in decision-making processes.

In essence, as cognitive ability increased, so did scanning strategies.

Preschool children may well detect differences among stimuli but still ignore those differences. Why do children ignore properties of the stimuli and attend carefully to others? For children, the relevance of a particular dimension often depends on the rules they use to make decisions. Also, improvements in spatial-relations skills seem to enhance correct choices in the same/different pairs. Basically, three successive steps are involved in the evolution of same/different discrimination. First, in the early period (up to 4 years), children show some ability to localize features according to vertical dimensions, but other locations are confused due to unsophisticated scanning strategies. During the second period, children accurately perceive differences in place but do not take them into account in making judgments. Third, children include differences in location in their decision rule about sameness. During this third period, when places seem to be different, they are called different. Errors sometimes arise because of the child's definition of same or different, not because of unsophisticated scanning strategies (Vurpillot & Moal, 1970). Other researchers concerned with scanning strategies and cognitive development have corroborated this change in ocular strategy (Kinchia, 1980; Klein, 1980; Vliestra, 1975).

Selective attention plays an important role in cognitive development and vice versa. People do not take in all of the available sensory information; rather, they select components of

stimuli for further study. Research on selective attention has shown that, with increasing mental age, children become better able to detect and maintain the focus of task-relevant features of the stimuli. In a study that involved the manipulation of component salience (Hale & Green, 1976), 9 year olds showed a greater tendency than 5 year olds to withdraw attention from shapes when the verbal instructions called for increasing attention to color. Broadbent (1987) found that for the selective operation of attending, a minimum necessary to perform the task was computed for efficient processing. Also, FitzGerald, Tattersall, and Broadbent (1988) found that attention was not necessarily broken down in two ways--that which was attended and that which was unattended. Lists that were given simultaneously were prioritized by the one attending.

Other investigators have examined selective attention in terms of the development of hemispheric asymmetry. Kinsbourne and Swanson (1979) conducted several studies on selective orientation to mental representation. In these studies they described the development of early neurological growth and how such growth determines selective response. This orienting response is the first act of selective attention, and it can be both anticipatory and reactive (Kinsbourne, 1978). From this beginning, the organism gradually develops more sophisticated ocular strategies, thereby enhancing cognitive skills.

Research on attentional processes and individual differences also needs to be noted. Much of the research concerns individual differences in information within and across developmental levels.



In particular, habituation studies dealing with the visual modality have received a good deal of attention (Cohen & Gelber, 1975; DeLoache, 1976; Richardson & McCluskey, 1983; Wachs & Smitherman, 1985). Habituation is defined as a decrease in the strength of the attending response as a function of repeated presentations of stimuli. Response decrement can be considered a measure of speed of model acquisition, and the amount of decrease might be associated with an efficient system of forming representations. Lewis and Baldini (1979) drew the following conclusions regarding attention processes and individual differences:

1. During infancy, redundant information does not, in general, elicit a high degree of attention.
2. Novel information (perhaps a moderate discrepancy) is preferred and does elicit attention.
3. Developmental changes occur in the process underlying these behaviors; an important transition takes place at about 2 to 3 months of age.
4. Attentional processes are critical in the child's intellectual growth.
5. Marked differences in attention exist among children, which appear to reflect individual differences in central nervous system integrity.

Weiner and Berzonsky (1975) conducted a study on selective attention that particularly concerns the different attention styles of reflective and impulsive children. The researchers administered

the Matching Familiar Figures (MFF) test to all second-, fourth-, and sixth-grade children available for testing in a rural central New York school district. Children above the class median for the MFF were considered reflective; those below the median were considered impulsive. This procedure casts some doubt on the findings, but they merit mentioning nevertheless. The writers found that reflective children generally did better than impulsive children on cognitive tasks. Sixth-grade reflective subjects were beginning to employ a selective strategy on the MFF, whereas impulsive children did not use this strategy. In general, the findings were similar to those of studies in which central learning was reported to increase with age.

Weiner and Berzonsky's research is important because it introduced the concept of cognitive tempo. The writers found that, given a certain level of alertness or arousal, the individual's cognitive tempo mediated whether he/she reflectively or impulsively selected a stimulus to attend to. In addition, the individual's cognitive tempo influenced how he/she monitored or verbally mediated information that had been attended to. Cognitive tempo also influenced whether an individual evaluated his/her behavioral responses and attended to feedback.

The writings on selective attention described the developmental sequence of attention. Understanding the development of attention is important in understanding how concentration develops. The ocular strategies and motor, cognitive, and perceptual skills are all necessary for voluntary, self-directed attention. In addition,

how one selects things from the environment and what one selects appear to show age-related patterns. If this hypothesis is true, then self-directed attention might well be precipitated by differing stimuli, contingent on the age of the individual. Further study in this area is needed.

Vigilance. Vigilance or sustained attention is "the extent to which the activities of a particular portion of the CNS [central nervous system] exhibit at any moment signs of integrative and purposive adaptation to indicate its vigilance" (Head, 1923). Head's definition was basically a physiological construct. He suggested that the word "vigilance" be used to denote a state of high-grade physiological efficiency. Head made this determination after examining decerebrate animals (i.e., a cat) and human patients with a severed spinal cord. He claimed that shortly after division, the human spinal cord, despite its movement and excitability, is in a condition of low vigilance. High vigilance is expressed in heightened extensor postural tone and acutely differentiated responses. The high state of physiological efficiency differs from a pure condition of raised excitability, "for although the threshold value of the stimulus is not of necessity lowered, it is associated not only with an increased reaction, but with highly adapted responses" (Head, 1923).

Concerning concentration, Head suggested that mechanical skills need to be automatic before an activity can be finished successfully. The performer must concentrate on the goal or

intention and trust to habitual skill for its mechanical execution. But all these aptitudes are profoundly influenced by general health or by anything that lowers physiological vitality (i.e., a cold or gastro-intestinal attack or worry can diminish mechanical skill).

In an effort to understand the physiological aspects of vigilance or sustained attention, Pillsbury (1973) probed the motor concomitants of attention. His discussion of motor effects of attention can be summarized as follows:

1. The muscles of sense organs contract to give the greatest possible effect to the stimulus.
2. The voluntary muscles and limbs and trunk undergo contractions that have previously been found useful under stimulations of the same kind.
3. There is a diffuse contraction of many voluntary muscles without reference to the nature of the stimulus (i.e., posture and limbs are directed toward the stimulus).
4. The respiratory and circulatory processes are profoundly affected (i.e., initially pulse slows, then quickens; arteries contract--less blood in the limbs and more goes to the brain; blood pressure increases; breathing has more frequent, shallow breaths followed by deep breaths).
5. The bodily processes succeed, or at most accompany, the attention. They do not precede it. (p. 25)

Beginning in the 1950s, researchers indicated an accelerated interest in the topic of vigilance, which had been introduced by Sir Henry Head 30 years before. This more recent research dealt with the attentiveness of a subject and his/her ability to detect changes in stimuli over relatively long periods of sustained observation. Much of the research in the 1950s used the Pavlovian classical-conditioning approach (Broadbent, 1953; Mackworth, cited in Warm, 1984). Mackworth advanced a comprehensive interpretation of vigilant behavior, relating observed phenomena of watchkeeping to principles of Pavlovian classical conditioning. He claimed that classical

conditioning was the original conditioning that took place in the demonstration period and that the subsequent decline in performance represented an extinction period.

Broadbent (1953) carried the analogy of watchkeeping even further. He interpreted vigilance in terms of attention and contended that stimulus selection was determined by stimulus intensity, biological importance, and novelty. Decrement in accuracy of detection was caused by stimulus competition (Levy, 1980). Jerison (1970) discovered that vigilance, which was originally viewed as a simulation of the watchkeeper's task, could also be helpful in studying orderly changes in attentiveness over a long period. Basically, Jerison (1970) found that the physiological results of his studies were consistent with habituation effects--that long interstimulus intervals allowed effects to be dissipated.

Studies have been conducted using classroom subgroups of hyperactive, inattentive, and aggressive students. The results of Kupietz and Richardson's (1978) study supported the general hypothesis that vigilant performance is related to a child's ability to remain attentive in the classroom. Levy (1979) found that social class factors, as well as age, were associated with the development of vigilance and inhibitory capacities in children.

A glaring omission of the more recent studies on vigilance is, as these researchers admitted, the failure to take into account the subjects' motivation. Hebb (1955) suggested that "the relationship between stimulus variation and responsiveness may be a motivational

one." The knowledge of results and reinforcements has led some investigators to find that vigilance decrement is largely the result of declining motivation for the task at hand (Davies & Parasuraman, 1982). Clearly, when motivation is not controlled within the study, it may become a confounding variable.

Another problem with the research on vigilance as it pertains to the present study is that all the tasks in previous investigations were "other-determined" assignments (i.e., the Continuous Performance Test and the Draw-a-Line-Slowly Test). Nevertheless, the writer found the physiological underpinnings of much of this research to be useful in understanding the process of attn/con.

In reporting the results of his research on vigilance, Pillsbury (1973) discussed the physiological dimension of attending. He observed such aftereffects of intense concentration as flushed cheeks, a motoric calmness, and a feeling of being energized. Pillsbury noted that, during intense concentration, the pulse initially slowed, then quickened, and less blood went to the limbs and more to the brain. He also found that subjects took more frequent breaths followed by deep breaths. Research on vigilance has also shown a relationship between habituation and sustained attention. Decrement in accuracy of attention could be caused by stimulus competition (Levy, 1980) and/or by long interstimulus intervals (Jerison, 1970).

Attentive behavior in the classroom. One of the more diverse areas of research concerns attentive behavior in the classroom. In

the past 5 to 10 years, much research has been conducted on the attentive behavior of the hyperactive and learning disabled child in the classroom. Another body of research included in the literature on attentive behavior in the classroom concerns the information-processing theory. Fewer but equally important studies have been undertaken on the teacher and student in the classroom environment. These three areas of research are discussed in the following pages.

Basically three types of research have been conducted on both learning disabled and hyperactive children. They are (a) studies of stimulus reduction (Hallahan, Kauffman, & Ball, 1973; Zentall, 1975, 1977; Zentall & Zentall, 1976), (b) distraction studies (Aman & Turbott, 1986; Dykman et al., 1984; Rosenthal & Allen, 1980), and (c) incidental learning studies (Doyle, 1973; Hagen & Hale, 1973; Ross, 1976).

Interesting findings have emerged from the stimulus-reduction studies. Most researchers have found no evidence to support the notion that academic performance improves when there is a reduction in stimulus. In fact, some investigators have even found increases in activity level when hyperactive children were placed in stimulus-reduced environments (Zentall & Zentall, 1976). It is difficult to interpret the results of these stimulus-reduction studies because many researchers have not consistently controlled the stimulation. Interpretation is made even more difficult because the results depend on whether the stimulation is part of the task, on the periphery of the task, or in the distal environment. This

distinction is important when one is trying to understand the effects of the stimulation. When studies were grouped according to locus of increased stimulation, no patterns emerged (Zentall, Zentall, & Barack, 1978).

In distraction studies, researchers typically have investigated the contention that children (both hyperactive and learning disabled) were unable to screen out task-irrelevant stimulation. These writers usually presented distractions, such as ringing telephones, flashing lights, and conflicting colors. Differences between hyperactive and learning disabled children have been noted in these studies. Although investigations have varied, no overwhelming evidence has shown that hyperactive children are easily distracted. On the contrary, learning disabled children have been found to have distinct problems with distractibility. When compared with normal pupils, learning disabled children attended to more competing irrelevant stimuli.

A subarea of the distraction studies is incidental learning research. Studies by Hagen and Hale (1973) and Smith and Kemler (1977) are particularly relevant. In working with school-aged children, Hagen and Hale used a central-incidental memory task. In this paradigm, children were presented with pictures containing two items, one of which was designated the central item. The researchers found that younger children, due to their mode of perceptual processing, did not heed the instructions and distributed their attention equally between the two sets of pictures, whereas the older children could better direct their attention.



The incidental-learning studies have taken a broad view that has not been restricted to the population of hyperactive and learning disabled children. Zentall et al. (1978) found that although hyperactive children responded faster than normals, they had more errors in choosing the central item across all tasks. As well, learning disabled youngsters had difficulty directing their attention to the central features of an externally provided task (Hallahan, Gajar, Cohen, & Tarver, 1978).

The information-processing approach to research in many ways parallels the study of attention. Information processing involves the formulation of theories and problem-solving tasks, such as those used in programming high-speed computers. Complex problem solving by adults has been analyzed using information-processing jargon (i.e., input and output). Through this process of analysis, interesting findings regarding the human thinking process have emerged. One such discovery, which was made by analyzing the quantity and quality of attention-demanding elements that the mind can handle, was that well-practiced responses to familiar situations demand little attention. Consequently, people can handle a large quantity of input (Piontrowski & Calfee, 1979).

Considering the other side of the issue, what might cause limitations in information processing? Keele (1978) suggested that there are limitations of time, space, and attention. Time itself is limited in two ways: (a) the length of time that stored information persists and (b) the time required for information to be transformed

into more persistent and abstract representations of events in the memory. Also, retrieving information from memory takes time. Limitations of space also influence information processing. For instance, conversing and typing interfere with each other and rarely can take place simultaneously. Another limitation is attention. One use of the term "attention" implies that when a person is attending to one thing, he/she cannot simultaneously attend to something else.

Research related to classroom attention has been concerned with (a) alertness (optimum sensitivity to the environment), (b) selectivity (scanning the environment to choose the most salient dimensions and to focus on those features while excluding others), and (c) central processing (automatic processing when the stimulus is familiar) (Piontrowski & Calfee, 1979). Writers who have conducted research on alertness have maintained that when the task is varied and the learning situation is kept interesting, one's attention is held (Brophy & Willis, 1981; Keele, 1978). Novelty, the personal approach, and humor are all successful methods for maintaining alertness in the classroom.

Selectivity of attention is another aspect of attentive behavior that has been explored in classroom studies. A person is most likely to notice aspects of a situation that are distinctive and that fit with what experience tells him/her is important (Norman, 1976). Some practical suggestions for increasing pupils' attention are that a teacher should try to emphasize critical

features of the stimuli, eliminate irrelevant features, and put an old stimulus into a new context (Piontrowski & Calfee, 1979).

Broadbent (1977) suggested that two cognitive processes are involved in selective attention: "filtering" and "pigeonholing." By filtering, one determines the salient aspects of a stimulus, and by pigeonholing one stores those aspects in long-term memory. Selectivity is influenced by external and internal sources of information. External sources are determined by the inherent properties of the stimulus, whereas internal sources depend on what is personally relevant to the perceiver. Navon (1987) found that when two words were presented simultaneously, the subject's attention was captured by the expected word; then attention was directed to where it was needed (to the unexpected word).

In summary, some distractors to task persistence and attention span were discussed in this section. These include unnecessary interventions and social reinforcement by adults, defective toys, and provision of extrinsic rewards when intrinsic motivation is present. The motivational literature, including the Origin-Pawn theory and its effect on persistence to task and Weiner's attributional theory and its effect on task motivation, was discussed. Finally, locus of control and the "external" personality have strong implications concerning one's persistence to task and motivational stance.

Because deep concentration is largely the result of voluntary, self-directed attention, the research on intrinsic motivation plays an important role in elucidating the motivational

determinants of concentration. The finding that persons with high intrinsic motivation (willingness to perform a task when there is no pressure to do so) might be expected to concentrate on the task at hand and therefore exhibit superior task performance might support the value of voluntary, self-directed attention.

The research on persistence to task also suggested that various environmental factors influence one's ability to concentrate. These factors include (a) large blocks of uninterrupted time, (b) undue interventions and interruptions, and (c) the caretaker/teacher's insistence that the child devote his/her entire attention to the task at hand.

Brain waves/biofeedback. Alpha, beta, theta, and delta waves are varying rhythms of electrical activity produced by the brain, which is like a huge telephone switchboard with billions of nerve cells. The electroencephalograph (EEG) measures these waves. These four basic wave forms have been confirmed repeatedly in EEG research (Boxerman & Spilken, 1975). From research on brain waves with the EEG, the science of biofeedback emerged. Biofeedback has been technically defined as operant conditioning, which means learning to control one's behavior (operations) by receiving constant rewards or punishments with the purpose of getting closer to one's goal (Boxerman & Spilken, 1975). Biofeedback procedures were refined during the 1970s and 1980s, and the technique has become highly sophisticated, but little biofeedback research has been done with children. One possible reason for the lack of alpha

training in children might be that "younger people have more imagination, reflected in alpha creativity, but as they get older and substitute logical thinking for the creative dreamlike state, they produce more Beta activity, and this is incorporated into their life style" (Stearn, 1976, p. 217).

In the 1970s, Satterfield conducted research using the EEG to diagnose and treat hyperactivity. He found that there may be a delayed CNS maturation in hyperkinetic children. The EEGs often showed that hyperkinetic children had "significantly lower evoked cortical response amplitudes and longer latencies than the age-matched controls" (Sullivan, 1975). Much of Satterfield's work involved testing the effects of the stimulant drug methylphenidate. As a result of this research, Satterfield, Cantwell, Saul, Lesser, and Podosin (1973) suggested that both a neurological and an EEG examination be used in assessing hyperactive children. These researchers found that subjects with abnormal EEGs had significantly more improvement when using methylphenidate than those with normal EEGs. In another study, Satterfield, Cantwell, Lesser, and Podosin (1972) found that patients with the lowest levels of arousal before treatment had the best clinical response to methylphenidate, and their EEGs suggested that the CNS-arousal effect of methylphenidate was greatest in them (Satterfield, Cantwell, Saul, Lesser, & Podosin, 1973).

Just a few studies have been done using alpha feedback devices with hyperactive children. Because there are so few studies, they have become rather important. In 1970-71, Nall conducted a pilot

study on alpha biofeedback training as a behavior modifier in hyperkinetic children with learning disabilities. The mean age of the subjects was 10 years old. All the subjects had abnormal alpha readings. One group was the no-treatment group; the other two groups received either (a) relaxation therapy only or (b) relaxation therapy plus auditory feedback from the Toomin Alpha Pacer. Nall found that the auditory-feedback group all learned to produce the alpha state. The results failed to confirm the hypothesis that alpha feedback training would produce a reduction in the hyperkinetic syndrome. Nall later tested the effect of alpha pacing on hyperkinetic youngsters. According to the final EEGs, 9 of the 16 subjects in one group and 7 of the 16 subjects in another group had an increase in amplitude of alpha waves. No significant differences in maladaptive behavior or overall achievement were noted. Nall's basic conclusion was that some children were helped by the technique and others were not.

In 1977, Gracenin and Cook conducted a follow-up study of Nall's work. They hypothesized that, by using biofeedback, learning disabled children would make significant gains in oral reading and in reading comprehension. All subjects were pre- and posttested with varying forms of the Standard Reading Inventory. The hypothesis that alpha biofeedback training would make a significant difference in reading scores was rejected. However, the subjects did gain in amplitude and duration of alpha waves. The children also showed a slight improvement in hyperkinetic and maladaptive

behavior and a significant increase in comprehension. Overall, the control group made better gains in oral reading, whereas the experimental group made better gains in comprehension.

How do brain waves affect one's ability to attend? Mulholland (1971) indicated that brain waves are faster when one is paying attention to something specific and alpha rhythms are blocked. The absence of alpha brain waves suggests an alert orientation. Mulholland attempted to train people to decrease their alpha rhythms; by so doing, the presence of beta waves would reveal a higher attention level. To test this theory, Mulholland and Runnals invented a slide projector system linked to a brain-wave-filter computer. When alpha waves returned, the pictures on the screen would disappear. To hold the image on the screen, alpha waves had to be turned off. Mulholland discovered that EEG brain-wave recordings did not provide the complete answer to understanding individual attention; intention also played a key role.

Mulholland (1971) tested the correlation between attention and brain waves. Brain-wave activity was used to check the attention subjects paid to slides of nudes and flowers. Male subjects paid attention to the slides of nudes, and, by paying attention, they flipped off alpha brain waves for beta. When their alpha waves ceased, the nude immediately disappeared because alpha production controlled the showing of the slides. The results of the study tended to show a relationship between alpha brain waves and attention; strongly directed attention shut off alpha waves.

An unexplained component of attention still remains. Ponty (cited in Nall, 1978), a noted phenomenologist, proposed that attention might really signify intention. He considered attention to be linked to an internal motivational state and thought that cultivation of particular brain-wave states might help increase attention span. Much more remains to be discovered in this largely uncharted area of mental functioning and attention.

The review of research, which has involved the many aspects of attn/con, has highlighted areas of interest to the researcher. In conjunction with the review of the literature on hyperactivity and attention, specific questions have emerged.

#### Research Questions

The following research questions were posed to guide the collection of data for this study:

1. What are the differences in patterns of attn/con between a child determined to be hyperactive and another child determined to be nonhyperactive?
2. When considering these two subjects, what are their intra-individual and interindividual differences?

Chapter III contains a detailed explanation of the design and methodology of the study.



## CHAPTER III

### METHODOLOGY

#### Methodology

To answer the research questions, a case study approach was employed in this study, in which the unit of analysis was the child. Specifically, the two subjects were Daric, a hyperactive child, and Liza, a nonhyperactive child. An ongoing extended-day classroom was videotaped. The classroom consisted of kindergarten-age children who attended school the full day (8:00 a.m. to 2:45 p.m.). From 20 hours of videotaping, 5 hours of videotapes were randomly selected. These tapes were analyzed, both Daric's and Liza's on-task and off-task behaviors were recorded, and case studies for the two subjects were compiled. (Subject-selection procedures may be found on page 87.) Other sources of data for the case studies were test evaluations, teacher evaluations, and psychological reports. The case study for each of the children included a physical description, family background, school environment, skill areas (language, pre-math, math, and a general intellectual evaluation), activity and attn/con patterns, interactions with others, classroom behaviors, indicators of self-concept, and coping style and response to frustration. This information was used in compiling a profile of each subject.

### Setting

The context of the study comprised the school, the classroom, and the other children in the class. The school was a small, private Montessori school with an enrollment of about 200 students. The socioeconomic status of the parents cut across all levels, but the majority of families were in the upper middle class. The parents typically were professionals with a strong commitment to the Montessori method of education. The school had three preschool classrooms (ages 2-1/2 to 6 years), three primary classrooms (ages 6 to 9 years), and one middle school classroom (ages 9 to 12 years). The Montessori method of education was developed in Europe by Maria Montessori, a medical doctor. The basic premise of this method is that teachers (called directresses) meet the child's developmental needs by guiding the child toward developmentally appropriate activities in the environment.

The facility had two buildings; one housed the preschool and primary classrooms, and the other housed the middle school. The school had two playgrounds, as well, one for the preschool and the other for the older children.

The extended-day classroom, where the videotaping was done, was rather small, but it was adequate for 12 children. The many shelves in the classroom were filled with hands-on activities for the children to choose. After selecting an activity, children placed the work on a table or rug and, when finished, returned it to the shelf. Thus, the tasks were self-chosen and self-initiated. At times, the directress guided the children into appropriate work.

These tasks varied from the simple to the complex. Use of the materials depended on the child's developmental level. Basically, four areas were developed: (a) pre-math and math activities; (b) pre-reading, pre-writing, and language activities; (c) sensorial activities, including geography and cultural activities; and (d) practical life and science activities. Students had hundreds of choices of available activities.

#### Overview of the Study Variables and Rationale for Their Selection

Two variables were used as part of the subject-selection process, three were used in gathering information for the case studies, and one was used as an outcome variable. The selection variables were hyperactivity and IQ. The researcher measured these characteristics and screened the classroom of 12 students for two case-study subjects, one hyperactive and the other nonhyperactive. The three descriptive variables were perceived competence and social acceptance, locus of control, and parental acceptance. Information on these variables was used to answer Research Question 2, which pertained to intra- and intersubject differences. The outcome variable was the length and frequency of attn/con. Information on the outcome variable was used to answer Research Question 1, which concerned differences in the patterns of attn/con between the two subjects.

The first selection variable, the subject's IQ, was measured with the Wechsler Preschool and Primary Scale of Intelligence

(WPPSI). Subjects with similar IQs were chosen for study to help ensure that the differences in attn/con between a hyperactive child and a nonhyperactive child were due to something other than the children's level of intellectual functioning. Also, some of the WPPSI subtests (i.e., the arithmetic subtest) are purported to test an individual's ability to concentrate. The instrument also measures the child's learning style and his/her approach to tasks (Sattler, 1982).

Hyperactivity was the other selection variable. All 12 students in the classroom were given the School Situations Questionnaire (Barkley, 1981). The test results clearly differentiate hyperactive from nonhyperactive youngsters. Of the 12 students in the classroom, Daric had the highest score on the Hyperactive Index and Liza had one of the lowest scores.

One of the descriptive variables was perceived competence and social acceptance. In their research, Harter and Pike (1984) noted the importance of this variable. They developed the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children, which is used to measure four domains of this variable: cognitive competence, physical competence, peer acceptance, and maternal acceptance. This self-appraisal scale was used in the present study because it measures constructs that are very similar to those of Bandura's (1977) research on self-efficacy, which is more cognitive in nature than the Pictorial Scale.

Bandura developed the self-efficacy theory to help predict and explain behavior change. Two factors he believed affect an

individual's motivation to change are efficacy expectations and outcome expectations. The key element of Bandura's approach is that the strength of a person's perception about his/her own self-efficacy and expectations for treatment outcomes will directly affect the amount and direction of behavior change. A strong sense of self-efficacy appears to enhance one's ability to persist with a task. Consequently, self-efficacy is an important factor in understanding why the subjects had different attending styles.

The next descriptive variable was the subject's locus of control. Internal or external locus of control was determined by means of the Stanford Preschool Internal-External Scale (SPIES) (Mischel, Zeiss, & Zeiss, 1974). This scale measures preschool children's expectancies about whether events are a result of their own action (internal control) or a result of external forces (external control). Researchers have shown that individuals who are free from external controls show a continuing interest and greater willingness to engage in challenging tasks (Maehr, 1969; Maehr & Stalling, 1972). Further, DeCharms, Carpenter, and Kuperman (1965) found that Origins (those exercising internal control) were more satisfied with their productions than were Pawns (those perceiving external control). Essentially, the research on personal causation, locus of control, and the Origin-Pawn theory has suggested: (a) the importance of the individual's sense of internal control, (b) relativity of motivation depending on the learner's interest and particular situation, and (c) the role of intrinsic motivation in

one's persistence to task. The last item was of particular interest in this study because persistence to task is necessary for long, frequent periods of attn/con.

The third descriptive variable was parental acceptance. Baumrind (1971) found that sons of authoritative parents were more friendly, cooperative, and achievement oriented than sons of any other types of parents. Daughters of authoritative parents were more dominant, achievement oriented, and independent. It appears, then, that child-rearing practices have a major influence on the child's school adjustment. Feelings of worth and competence begin in the home, and task persistence, in large part, results from the child's feelings of self-efficacy. Hence, parental acceptance was investigated to illuminate the relationship between the subjects' homes and their persistence to task and attn/con.

The outcome variable, subjects' length and frequency of attn/con, was the primary focus of the study. Attention was defined as the initial phase of task orientation, which would proceed toward concentration when the conditions were right (Kinsbourne et al., 1979). The individual initially enlists a task orientation when he/she focuses on the activity; the person then processes the information necessary to proceed toward completion. This variable was investigated in an attempt to understand the differences in attn/con between the two subjects. Figure 3.1 lists the variables selected for the study and the instrument used in gathering data on each variable.

Variable	Variable Type	Measure Used	Group Measured
IQ	Selection Variable	Wechsler Pre-School & Primary Scale of Intelligence (WPPSI)	All 12 classroom students
Hyper-activity	Selection Variable	School Situations Questionnaire	All 12 classroom students
Locus of Control	Descriptive Variable	Stanford Preschool Internal-External Scale (SPIES)	All 12 classroom students
Perceived Competence & Social Acceptance	Descriptive Variable	Pictorial Scale of Perceived Competence & Social Acceptance for Young Children	All 12 classroom students
Parental Acceptance	Descriptive Variable	Porter Parental Acceptance Scale	All 12 classroom students
Length & Frequency of Attn/Con	Outcome Variable	On-Task/Off-Task Observation Form	Liza (non-hyperactive) Daric (hyperactive)

Figure 3.1: Variable matrix.

### Instrumentation

#### The Student Situations Questionnaire and Conner's Teacher Rating Scale

The Student Situations Questionnaire (SSQ) is a teacher rating scale that is used to determine problem behaviors in school settings. (See Appendix A.) Teacher rating scales of hyperactivity tend to be more reliable than parent ratings (Barkley, 1981). The SSQ is concerned with the settings in which behavior problems occur, rather than with the types of problems. It is useful as a preliminary test to Conner's Teacher Rating Scale (TRS). Normative, reliability, and validity data on the SSQ are now under study.

Conner's TRS is a 39-item scale; the items are grouped into three general classes: group participation, classroom behavior, and attitude toward authority. (See Appendix B.) Each item is rated on a 4-point scale with 0 = not at all, 1 = just a little, 2 = pretty much, and 3 = very much. Factor analysis of the TRS revealed the following general item clusters: aggressive conduct, daydreaming, inattention, anxiety, fearfulness, hyperactivity, and sociability-cooperativeness. The TRS can be scored for the hyperactivity index (10 items); a mean score of 1.5 or higher is generally accepted as indicating hyperactivity. The scale has been shown to have acceptable test-retest reliability, and it discriminates hyperactive from normal children (Barkley, 1981; Sattler, 1980).

Barkley thought that using the SSQ and Conner's TRS together was appropriate because the SSQ is concerned with school situations and Conner's TRS is concerned with attitudes and behaviors. Barkley



suggested that, before making a diagnosis of hyperactivity, it should be determined that (a) the child has received a minimum score of 1.5 on the hyperactivity index of Conner's TRS and (b) problems with behavior should appear in at least 50% of the situations on the SSQ.

The Pictorial Scale of Perceived Competence  
and Social Acceptance for Young Children

The Pictorial Scale, developed by Harter and Pike (1984), is designed to assess perceived competence and social acceptance in children 4 to 7 years of age. (See Appendix C.) Children's self-judgments are measured within the specific domains of cognitive competence, physical competence, peer acceptance, and maternal acceptance. A pictorial format is used to make the activity more interesting and understandable to children.

The scale measures two general constructs, perceived competence and perceived social acceptance. Each of these two constructs has two subscales. The subscales for perceived competence are cognitive competence and physical competence; those for social acceptance are peer acceptance and maternal acceptance. Each of these four subscales contains six items. The scales are accompanied by separate picture plates of boys and girls, so the child responds to a pictured child of the same gender as him/herself.

The reliabilities of the individual subscales of the Pictorial Scale ranged from .50 to .85. The reliability of the total scale (24 items) was in the middle to high .80's (Harter & Pike, 1984).

However, the range of scores was skewed toward the upper end of the scale, and this restricted range led to lower statistical estimates of reliability. Intercorrelations were calculated for each of the four subscales. The two competence subscales intercorrelated moderately, and the two social acceptance subscales intercorrelated moderately high. Weak correlations were found between child and teacher ratings. These values were .37 for cognitive competence, .30 for physical competence, and .06 for social acceptance.

Validity data were also gathered for the Pictorial Scale. After administering the scale, the authors asked responding children why they felt they were or were not competent; 96% of the children readily gave specific reasons. Also, Harter and Pike thought children who had been held back in the first grade would score lower on cognitive competence than those who had been promoted to second grade. True to expectations, children who had been retained were found to be significantly lower in cognitive competence (2.4) than their peers who had been promoted (3.3). In the social domain, new children had lower mean scores (2.9) than those who had attended the school the year before (3.3). In the physical domain, children who had been born preterm had substantially lower score (2.3) than full-term children (3.1). Thus, the various subscales appeared to discriminate between subgroups in the normative sample.

Through children's self-judgments, the Pictorial Scale measures the individual's perceived competence and social acceptance. Although the scores tended to be skewed toward positive self-evaluation, the authors found that this tendency was greater for the

competence subscales than for the social acceptance subscales. In essence, although it is not a perfect measure, the Pictorial Scale is a useful tool for increasing the understanding of children's self-appraisals.

#### The Stanford Preschool Internal-External Scale

The Stanford Preschool Internal-External Scale (SPIES) (Mischel et al., 1974) measures preschool children's expectancies about whether events occur as a consequence of their own actions (internal control) or as a result of external forces (external control). (See Appendix D.) A forced-choice format is used, and the SPIES is scored in the internal direction. The scores denote expectancies for internal control of positive events.

Internal control is defined as the perception that positive or negative events are a consequence of one's own action and are thereby under personal control (Rotter et al., 1962). The scale was constructed using situations that would be appropriate to the preschool child. The SPIES consists of 14 forced-choice questions, each of which describes either a positive or a negative event that presumably could occur in a child's life. A weakness of this scale is its failure to recognize the limited attention and interest spans of young children.

Mischel et al. considered expectancies about positive and negative outcomes to be independent. Consequently, they used two subscales to yield measures of expectancies for internal versus

external control separately for positive and negative outcomes. They expected that internally controlled individuals would actively seek positive outcomes, but in the negative outcomes subtest they would actively try to avoid negative outcomes.

To obtain normative data, Mischel et al. administered the SPIES to a sample of 210 subjects (98 boys and 112 girls). They established content validity by asking six children who did not take the test about the situations posed in the SPIES (i.e., "I'm going to tell you about something that happened to boys and girls and you can tell me if you would like those things to happen to you"). Only one child disagreed with the content valence, so 97.6% of the replies were in accordance with the researchers' expectations.

To assess split-half reliability, the researchers computed Pearson product-moment correlations between the positive and negative subscales. Split-half reliability for the positive subscales was .42, for the negative subscales it was .52, and for the entire scale it was .47. Test-retest reliability was determined using a sample of 58 children, with a mean of 4 months between tests. Correlations between scores were all positive and generally significant, ranging from .21 to .72.

Validity data were obtained in a study by Mischel and Moore (1973). They investigated the effects of slide-presented attentional cues on preschool children's ability to either wait or work for delayed rewards. Half of the children had only to sit and wait passively; the other half had to work continuously by engaging in an instrumental activity (repetitively tapping a telegraph key).

Correlations for Total I scores for each of the groups were computed separately for working and waiting conditions. The relationship between the children's beliefs regarding control and their delay of behavior approached significance (Mischel et al., 1974).

In summary, the SPIES has acceptable validity and reliability. The relatively short 14-question forced-choice scale measures internal and external locus of control, as well as the expectation of locus of control for negative and positive events. The SPIES was used in this study because there appears to be a relationship between one's internal control and persistence to task.

#### The Wechsler Preschool and Primary Scale of Intelligence

The Wechsler Preschool and Primary Scale of Intelligence (WPPSI) is used to measure the IQ of children between the ages of 4 and 6-1/2 years. Average reliabilities of the test range from .77 to .87 for the individual subtests and from .93 to .96 for the three scales. Comparative validity studies between the WPPSI and the Stanford-Binet have indicated that the two scales correlate highly (median  $r = .81$ ). As well, the WPPSI correlates highly with the WISC-R.

The WPPSI was used to assess the intellectual functioning of the subjects in the study. This measure was chosen because of its excellent reliability and its diagnostic abilities. In addition, it was age appropriate for the present research, and children have expressed enjoyment in taking the test (Sattler, 1982). The instrument also has excellent psychometric properties.

### The Porter Parental Acceptance Scale

The Porter Parental Acceptance Scale (PPAS) (Porter, 1954) was used to measure the qualitative elements in the parent-child relationship. (See Appendix E.) Porter defined parental acceptance as follows:

1. He does not become emotionally disturbed because the child expresses negative feelings. He realizes that such feelings need to be expressed for the maintenance of good mental health.
2. He makes a point of accepting and returning positive feelings.
3. He encourages freedom of emotional expression; shows the child that all feelings are understandable and that it is alright [sic] to have them, but at the same time helps the child find ways of expressing his feelings so that they do not produce guilt.
4. He keeps communication channels open.
5. He listens with an open mind to the child's side of the problem when there is a conflict. He has a willingness to concede that he [the parent] is sometimes wrong.

Porter defined an accepting parent as "one who regards the child as a person with feelings and respects the child's right and need to express these feelings." His basic assumption was that the feelings and behaviors the parent displays with the child (what he called parental acceptance) can be measured quantitatively.

The PPAS has a split-half reliability of .76. The Spearman Brown Prophecy Formula was also applied, yielding a reliability of .86. Validity was tested using judges' ratings; there was only 18.67% disagreement in the responses. Thus, it appears that the PPAS has survived tests of both reliability and validity.

### The On-Task/Off-Task Observation Form

This form, developed by the researcher, was used to determine the frequency and duration of periods of attn/con. (See Appendix F.) Attn/con was operationally defined as periods of on-task behavior that lasted 5 minutes or longer. The interval length of the observational unit was 15 seconds, based on Abikoff's (1977) observation methodologies. Fifteen-second intervals were checked under the heading "on-task" or "off-task," depending on the particular behavior of the subject. Characteristics of on-task and off-task behaviors were as follows:

#### **On-Task Behaviors:**

Exclusivity of attention on the task at hand.

Daydreaming--when the child is not attending to the specific stimulus; daydreaming was scored as on-task behavior as long as it did not exceed 30 seconds.

Minor motor movement--a general measure of chair restlessness. Only buttocks movements and body and chair-rocking movements were included. This was scored as on-task behavior, provided visual focus remained on the task.

#### **Off-Task Behaviors:**

Interference as disruptiveness. Included were calling out, interruption of others during work periods, and clowning.

Solicitation--reflects how often the child sought out the teacher's attention.

Inattentiveness--indicates attention to stimuli other than the task-relevant behaviors.

Gross motor movements--refers to standing, as well as vigorous activities such as running and jumping.

Noncompliance--the child's failure to comply with the teacher's commands.

Out of chair--unless the activity was on the rug or at a kneeling table, this was considered an off-task behavior.

Physical aggression--refers to destructive physical behaviors such as hitting, pushing, and throwing objects.

Threat or verbal aggression--abusive or threatening verbalizations and physical gestures directed toward the teacher.

Extended verbalization--scored "off-task" when the child was engaging in lengthy conversations with the teacher or other students in the class.

Extended daydreaming--when visual focus off the task was greater than 30 seconds.

Two observers who helped with data collection were trained to understand these behaviors and to record them appropriately on the checklist. The two raters watched the same 2-hour preview videotape of Liza and Daric and recorded the necessary information. Raters viewed the same segment of the videotape twice, once for each subject, as they filled out the checklist. First, Liza was observed on the tape; then Daric was observed. The raters made behavior assessments at 15-second intervals and checked the appropriate box on the checklist to indicate whether the subject's behavior was on-task or off-task. The researcher and the raters discussed and clarified the criteria for what was considered on-task and off-task behavior. After the raters had completed the checklists, the researcher ran interrater reliability tests on those forms. For the videotape and checklist on Liza, there was 85% agreement between the two raters. For the videotape and checklist on Daric, there was 83% agreement between the raters. This



percentage of agreement was considered adequate to determine that the On-Task/Off-Task Checklist was reliable.

### Subjects

The subjects for the study were two pupils (Daric and Liza) chosen from a classroom of eleven 5 year olds and one 6 year old. Testing was done on all 12 students. The On-Task/Off-Task Behavior Checklist was completed for only the two subjects, Daric and Liza. The variable measured by this checklist was the length and frequency of attn/con for the two subjects.

The first reason Daric and Liza were chosen to be the subjects of the study was that their results on the WPPSI were similar (Daric had a full-scale score of 118 and Liza had a full-scale score of 134). (See Table 3.1.) They both were in the top 10% of the students in their age range. Liza was in the "very superior" classification, and Daric was in the "superior" classification. Thus, any differences that might be found between the subjects in attn/con patterns probably were not due to major differences in IQ. According to the WPPSI, Liza's strengths appeared to be in forming verbal concepts; her weaker area was her attention to detail and discerning essential from nonessential detail. Daric's strength appeared to be his responsiveness to the environment and spatial visualization. His weaker areas were his sense of detail and his impulsive, nonreflective learning style.

Table 3.1: Results on the Wechsler Preschool and Primary Scale of Intelligence

Student Number	Score		
	Verbal	Performance	Full-Scale
014 (Liza)	141	119	134
016 (Daric)	122	109	118
012	124	111	119
013	122	110	118
015	97	105	101
017	121	124	125
018	115	120	119
019	121	105	115
020	111	110	111
021	125	126	128
022	140	112	129
023	107	103	106

Note: Verbal scale mean = 120.5  
Performance scale mean = 112.8  
Full-scale mean = 119.2

The second reason Liza and Daric were selected as subjects was that they had significantly different scores on the SSQ. (See Table 3.2.) Based on the SSQ results, Daric was determined to be hyperactive and Liza to be nonhyperactive. Daric was also given Conner's TRS to verify his tendency toward hyperactivity, as determined by the SSQ. Barkley (1981) suggested that before making a diagnosis of hyperactivity, (a) the child should have received a minimum score of 1.5 on the hyperactivity index of Conner's TRS and (b) problems with behavior should have appeared in at least 50% of the situations on the SSQ. Daric received a score of 2.6 on the hyperactivity index of Conner's TRS and had behavioral problems in

all 12 situations on the SSQ. In general, Liza had no problem areas. A question mark by "during individual desk work" might suggest that Liza infrequently had some difficulty with this item. Therefore, based on the results of these tests, Daric was considered hyperactive and Liza was considered nonhyperactive.

Table 3.2: Results on the School Situations Questionnaire

Student Number	Score
014 (Liza)	0
016 (Daric)	83
012	0
013	0
015	33
017	21
018	8
019	51
020	13
021	3
022	2
023	0

Note: Group mean = 18.

The SPIES, the Pictorial Scale, and the PPAS were used to gather information concerning the descriptive variables for the 12 pupils in the classroom as a point of comparison with the two subjects chosen for the study. For the first descriptive variable, **T**ocus of control, the group mean on the SPIES (combining both **P**ositive and negative scales) was a Total I score of 3. (See Table 3 - 3.) Mischel et al. (1974) found the average Total I score to be 5 - 91. This finding suggests that the students in the present study

Table 3.3: *children's Scores on All Measures*

Student Number	SPIES	SSQ	WPPSI			Pictorial Scale				PPAS
			Verbal	Perform- ance	Full- Scale	Cogni- tive	Peer Accept.	Physical Compet.	Maternal Accept.	
014 (Liza)	5	0	141	119	134	3.83	3.17	3.50	3.17	108
016 (Dario)	2	83	122	109	118	3.50	2.83	3.00	2.83	107
012	4	0	124	111	119	3.67	2.83	3.50	2.83	101
013	5	0	122	110	118	4.00	3.17	3.50	4.00	113
015	3	33	97	105	101	2.50	3.00	3.66	2.83	NR <sup>a</sup>
017	4	21	121	214	125	4.00	3.83	3.60	4.00	NR
018	1	8	115	120	119	4.00	3.00	4.00	4.00	NR
019	4	51	121	105	115	3.83	2.30	3.83	2.50	NR
020	1	13	111	110	111	3.60	2.12	3.67	2.83	106
021	4	3	125	126	128	3.83	2.83	3.17	3.00	111
022	4	2	140	112	129	3.67	2.30	3.00	2.67	95
023	0	0	107	103	106	3.30	2.50	3.00	2.67	NR

Note: SPIES mean = 3  
PPAS mean = 106

Cognitive scale mean = 3.64  
Peer acceptance scale mean = 2.85  
Physical competence scale mean = 3.45  
Maternal acceptance scale mean = 3.11

<sup>a</sup>NR = Scale not returned.

were less internally controlled than the subjects in Mischel et al.'s research. For the second descriptive variable, perceived competence and social acceptance, the group means on the Pictorial Scale were 3.64 for cognitive competence, 2.83 for peer acceptance, 3.45 for physical competence, and 3.11 for maternal acceptance. (See Table 3.3.) This information is helpful as a point of comparison for the two subjects chosen for the study. Liza scored above the mean on all four domains. Daric scored below the mean on all domains except peer acceptance, on which he scored on the mean. These differences are discussed in the case studies of the subjects. The third descriptive variable was parental acceptance. The PPAS was sent home with all 12 pupils. Only 7 of the 12 forms were returned. On these seven, the group mean was 106. (See Table 3.3.) Both Daric's and Liza's scores were near the mean.

To measure the outcome variable, the length and frequency of attn/con, just Daric and Liza were observed and recorded. The videotaping was done during the class work time (12:30 p.m. to 1:30 p.m.). The On-Task/Off-Task Observation Form was used to note the two subjects' length and frequency of attn/con. Using direct observation, the periods of on-task behaviors were recorded.

#### Procedure

A surveillance-type video camera was donated to the researcher and was secured on the wall of the classroom. A wide-angle lens and an adapter were purchased for the camera. The children were given a week with the camera in the room and a brief discussion before the

actual filming. Filming was done from November 11 to December 6, 1985. The first week of filming was done to help the researcher determine the best camera angle and whether any changes in the physical arrangement of the classroom were necessary. It was decided that a large area in front of the camera was needed to get interactions between the youngsters and to film some group activities. These videotapes were used in training the observers and in completing the On-Task/Off-Task Behavior Checklists. Later, a 15-minute videotape was made from the 20 hours of tape filmed. Also, Daric and Liza were filmed in their second-grade classroom for this videotape and as a follow-up of the study.

#### Limitations and Generalizability of the Study

The study had three main limitations. First, the researcher was the teacher in the classroom used in the study. Consequently, there could have been some researcher bias in the choice and observations of the subjects. However, the videotapes were recorded and the On-Task/Off-Task Behavior Checklists were completed by the researcher and an impartial rater. The results of the interrater reliability tests, with more than 80% agreement between the two raters, suggested that there was not an unreasonable amount of researcher bias.

Second, measurement error could be considered a limitation of the study. The instruments used in the study might not have measured what they were purported to measure. For example, the SPIES had a reliability of .47 considering both the negative- and



positive-outcome subtests. Children are difficult to measure because of their occasional inability to understand adults' verbalizations. Therefore, measurement error could have existed in the WPPSI, the Pictorial Scale, and the SPIES.

A third limitation was that the camera provided less information than the researcher desired. The detailed expressions of the children were not visible because the camera was stationary and not positioned close enough to the children's faces. In an effort to capture the entire classroom on tape, the smaller, close-up shots had to be compromised. However, the videotapes were adequate for use in completing the On-Task/Off-Task Behavior Checklists.

The sample was small; only two students were used for the case studies. These two students were studied within the context of a classroom, so the present research has value in terms of other classroom studies. The generalizability of the study is low, however. The results of the investigation can be applied only to subjects who are very similar to Liza and Daric.





## CHAPTER IV

### RESULTS AND DISCUSSION

#### Introduction

Results of the analysis of the data generated from this study are reported in this chapter. Data were compiled on the following topics: (a) physical description of the child, (b) family background of the child, (c) the youngster's school environment, (d) skill areas, (e) activity patterns and patterns of attn/con, (f) interactions with others, (g) classroom behaviors, (h) indicators of self-concept, and (i) coping style and response to frustration. Information regarding these topics was compiled from the tests that were administered, from year-end reports, and from the scales that were sent home for parents to complete and return. Information was also obtained from a psychologist's evaluation and from a multi-disciplinary team, which comprised a social worker, a language specialist, and a school psychologist. Information on the patterns of attn/con was obtained by reviewing the 5-hour videotape that was made in the classroom during November and December 1985. These tapes were reviewed, and Daric and Liza's on-task and off-task behaviors were recorded.

From this information the researcher developed two case studies, which are presented in this chapter. The first case study



is of Daric, and the second concerns Liza. In the third section of the chapter, the two children are compared. The interindividual differences are presented and evaluated. From this section, some speculative conclusions are drawn regarding the differences between a hyperactive and a nonhyperactive child.

### Case Study 1: Daric

#### Physical Description

Daric was a high-energy child with quick brown eyes and shiny brown hair. His movements were quick and determined. Sometimes it appeared as though he had wheels instead of feet. If there was some excitement in the classroom Daric had either initiated it or was the first to arrive on the scene. His physical build lent itself to movement. He was short, light, and wiry. His laugh was a loud cackle, which usually went along with a mischievous twinkle in his eyes. His hands were short and spatulated at the finger tips; they were perpetually in motion. His head movements were quick and usually preceded the direction of body movement. His head was frequently cocked back and his chest thrust forward, giving the impression of a military person. Daric's most dominant characteristic was his high energy and his inability to focus on his work.

#### Family Background

Daric's father, a blue-collar worker, worked for the consolidated gas company. Daric's stature and his high energy were quite similar to his father's. The family lived on a farm north of



a large city. They had several animals, but only a few other children with whom to play. The father had spent much time teaching Daric survival skills and how to hunt. Daric also had a mother and a twin. Nate, his twin brother, had a profound hearing loss, which had been partially corrected by a hearing aid. In a multidisciplinary evaluation done at an elementary school on September 20, 1984, Daric's relationship with his father was characterized as follows:

Daric was described by his mother as having a very good mutual relationship with his father. Yet, Daric tries to push his father past the limits that are set for him. Daric's mother describes her husband as being inconsistent with Daric, overlooking some of his behaviors until he can no longer tolerate it and then comes down hard on Daric. At times, this makes Daric more aggressive.

Daric shared his father's love of the outdoors, and even though his parents worked full time, the three of them appeared to spend many off hours learning survival skills in the woods or doing the animal chores on the farm. In the psychological evaluation done June 8, 1985, the father was not interviewed but was quoted as saying that Daric was perfectly normal. He also stated that he himself was a "hell-raiser." It appeared to many persons that Daric and his father identified with each other.

The mother was a full-time secretary and had done some paralegal work on her job. In most cases, she had been the one to find help. She had sought evaluations from local school districts, as well as from a local psychologist. The evaluation for the school district was done by a multidisciplinary team. Members of the team

were a social worker, a teacher of the language impaired, and a school psychologist. Daric's mother considered herself the disciplinarian of the family, and she disciplined him by scolding, sitting him on a chair, spanking, or taking away privileges. At these times, according to his mother, Daric cried easily and tended to ask for reassurance. The mother also mentioned that Daric's sensitivity showed itself when he witnessed arguments between his parents. At such times, he tried to play the parental role by trying to calm the participants.

Daric's relationship with his brother was unique. Emotions in the relationship between Daric and his twin brother, Nate, ranged from a jealous possessiveness to caring and protection. At times, there appeared to be resentment and hatred. The psychological evaluation contained reports of Daric's aggression toward Nate. The mother reported that Daric had grabbed Nate's throat, bitten him, bitten him on the ear, and performed other aggressive and dangerous acts. Nate had a severe hearing loss, and Daric had acted as his guide and protector through much of their early childhood. However, Nate now had a hearing aid, and Daric's role toward his brother had changed. At times, Daric expressed anger about this displacement. In the psychological evaluation, the psychologist reported that on the Bender Gestalt test Daric revealed himself as a willful, undisciplined person who was more interested in expressing his own feelings, emotions, and motivations than in following instructions. He did not lose interest; he simply tended to go his own way and followed his own impulses. On the Rorschach test, he showed

considerably more creativity than the average child his age. He showed more preoccupation with violence, blood, fire, monsters, and threatening forces. He thought that his brother Nate did not love him (this may have been due to his brother's hearing aid and his lessened dependence on Daric). It was noted in the report that children as well as adults confuse dependency with love.

### School Environment

During the study, Daric attended a Montessori school. This school was a small, private school with an enrollment of about 200 students. It used the Montessori method of education from preschool through sixth grade. Most of the parents were white-collar workers, coming from a professional group. In a majority of the families, both parents worked. In the morning, Daric was in a preschool classroom of 18 children whose ages ranged from 2-1/2 to 6 years. In the afternoon, he was with 11 other 5 year olds in what was called an extended-day classroom. These children attended school from 8:00 in the morning until 2:45 in the afternoon. The extended-day portion of their day consisted of work that was academically oriented. Nate and Daric were consistently put in different classes at their parents' request. Generally, Daric and Nate liked school and thought it was a positive place. The Montessori philosophy encourages individual differences and promotes independent decision making in classroom choices. Daric had freedom of movement within the classroom limitations, and many hands-on activities were present in the classroom.



### Skill Areas

Much of the information concerning Daric's skill level was taken from the findings of numerous tests he was given. Some of these tests were the WPPSI, Mean Length of Utterance, Bender Gestalt, Test of Language Development (TOLD), Preschool Attainment Record, Peabody Vocabulary Test-Revised, McCarthy Scales, Bender Gestalt, Projective Drawings, Draw-a-Person, Rorschach, the SPIES, and the Pictorial Scale.

Language. Daric's score on the Mean Length of Utterance was 6.30 (Brown's Stage V+); overall, he demonstrated well-developed structures. On the TOLD, Daric demonstrated average performance in grammatic understanding and sentence limitation; syntax was also average. In grammatic completion, he performed below average; however, this may have been due to his not understanding the directions. Daric displayed good ability to comprehend, and he had a fine ability to understand in the articulation observations; some errors were due to developmental lag. The Preschool Attainment Record placed Daric at the 5 year, 6 month level in his knowledge of general information. In her final evaluation, Daric's preschool teacher noted that the child was able to express himself well orally, and he enjoyed socializing and sharing ideas with other children.

Pre-math and math. In her final report, Daric's preschool teacher stated that he had grown well in number concepts and that

his understanding of 1-100 was strong. He was also doing simple addition and subtraction with manipulatives.

Overall intellectual evaluation. Daric was functioning intellectually at the "bright normal" level. He was at the 90th percentile, which means that he was functioning in approximately the top 10% of the standardized population for children in his age range. According to the WPPSI evaluation write-up, Daric's greatest strengths were his perceptual organization and spatial visualization. Another strong area was his alertness to his environment and the apparent richness of his early educational milieu. Daric's weaker areas were his perception of detail and his ability to discern essential from nonessential details. His problem-solving abilities were somewhat limited in that he tended to rely exclusively on the trial-and-error method of problem solving and was essentially nonreflective in his approach to tasks. Daric's Verbal IQ was 122, his Performance IQ was 110, and his Full Scale IQ was 118.

According to the McCarthy Scales, Daric's General Cognitive Index was 109 (the mean being 100). Results on the McCarthy Scales indicated that Daric's overall abilities were within the upper limits of the average range for his chronological age. He demonstrated high-average verbal abilities and average abilities in perceptual/performance (nonverbal) areas; quantitative and memory areas were also average. Relative strengths were noted in his visual memory, expressive vocabulary skills, and verbal fluency/categorization abilities. Although Daric's numerical memory



(repetition of digits) was at the 3-1/2 year level, this was not considered to reflect an area of weakness because he demonstrated auditory recall for words, sentences, and story details at the 4-1/2 year level. He was able accurately to repeat nine-syllable sentences presented by the speech therapist during the evaluation. Therefore, all of Daric's abilities that were sampled were considered to be at or to exceed his chronological age level at that time. On number and counting tasks, he accurately rote counted through 14 and transposed four numbers in counting through 29. He accurately counted objects using a one-to-one correspondence through 12. Daric's visual motor development, as measured on paper-and-pencil copying tasks, was at a 4-1/2 year age-equivalency level.

#### Activity Patterns and Patterns of Attention/Concentration

From the beginning of the school year, Daric had a series of problems in the classroom. His teacher made some revealing notes at the beginning of the year. They are as follows:

9/12/85--The first day of school, Daric rolled a large cylinder across the floor.

9/17/85--Daric bit Andreas. Daric's mother was phoned during school and she talked to him. The mother later reported that he was disciplined at home.

10/3/85--Daric attempted to bite Charles. There appeared to be no provocation. The teacher intervened.

10/15/85--Was not allowed to go to gym class because he shoved and pushed in the line.

10/17/85--Conference with Daric's parents. They expressed concern, and the mother mentioned that he always chose black when doing art work. Father expressed no desire to bring him to a psychologist and was resistant to medication for hyperactivity. The mother said that Nate was often abused by Daric. The father in frustration wanted to send a squad of cops in the school to scare him, but the mother did not see the value to that. Considering the circumstances, a behavior modification program was introduced and the parents seemed to be in agreement.

10/21/85--Daric received a "Happy gram" from Barb J., the French teacher.

10/22/85--Daric's mother wanted Nate's teacher to give him a "Happy gram" because Nate was becoming the bad guy at home. The teacher said that that program was only between Daric and his teacher.

10/23/85--Daric was given another "Happy gram."

The behavior modification program continued until the spring conference. The success was temporary and sporadic. At the spring conference, it was decided that Daric take medication for hyperactivity. Generally, Daric's activity pattern was quite negative and counterproductive. From the review of the videotapes taken during November and December 1985, Daric's pattern of attn/con was disclosed. It was found that he had no periods of concentration that lasted 5 minutes or longer. Concentrated, on-task behavior was, in fact, rather rare. Figure 4.1 illustrates the number of on-task and off-task behaviors recorded from the 5 hours of an on-going classroom. The notation NOS was made on the On-Task/Off-Task Checklist when Daric was not visible on the screen. The percentage of time he was not on the screen is noted on the figure.

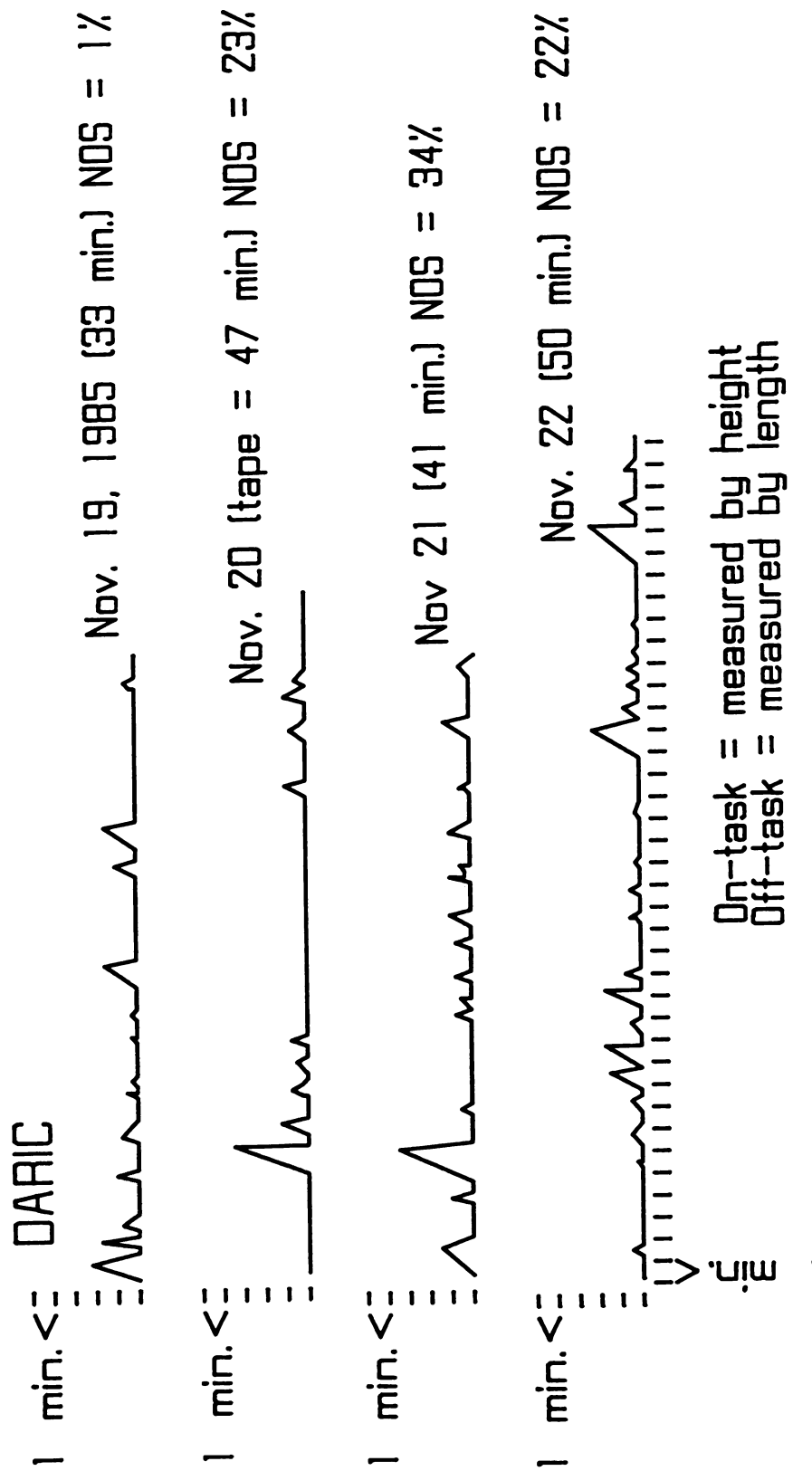


Figure 4.1: Incidence of Daric's task change.

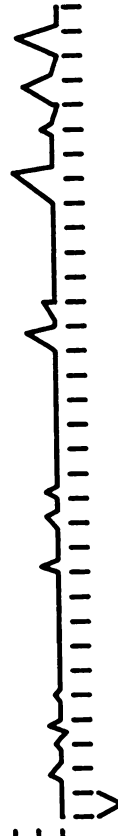
# DARIC

1 min. <= Nov. 26 (tape = 35 mins.) NDS = 25%



Dec. 4 (tape = 44 min.) NDS = 14%

1 min. <= Dec. 5 (tape = 52 min.) NDS = 40%



On-task = measured by height  
Off-task = measured by length

Figure 4.1: Continued.

### Interactions With Others

Peers at school. At the beginning of the 1985-86 school year, Daric bit other children. Both incidents appeared to be unprovoked. Daric's relationship with the children in the class was erratic and occasionally defied explanation. At the beginning of the year, the other children were somewhat afraid of him. But, despite the biting incidents, the other students enjoyed talking and working with Daric as the year progressed. Generally, he was not ostracized. At the end of the school year, however, when the other children were beginning to understand the concept of rules, Daric was accused of violating the rules of a game. This was noted in the year-end report of his extended-day teacher:

Also, the dislike the children had for him at the beginning of the year has returned since he "cheated" (according to the music teacher) during a game in music which caused the boys to lose. The boys are still upset with Daric. (April 23, 1986)

Parents. Daric's mother was deeply concerned about him, as was evident from the two evaluations (one from a psychologist and another from a multidisciplinary evaluation team). The father seemed to be quite unsure about Daric despite the fact that he had been quoted as saying that Daric was "perfectly normal." He had also stated that he himself was a "hell-raiser," too. There seemed to be a strong identification between Daric and his father. The parents completed the Porter Parental Acceptance Scale, and it was found that they placed the first priority on Daric's autonomy. The second priority was on feelings, and the third was Daric's



uniqueness. The score that Daric received in autonomy was above the mean for the extended-day classroom.

Sibling. There seemed to be intense competition between Daric and his twin brother, Nate. There also appeared to be a good guy/bad guy dynamic between the two. When Daric was given positive attention in the classroom, Nate's teacher reported that she had found him in the bathroom pulling the toilet paper onto the floor. A similar situation arose during the school year. Daric was given a note to be sent home when his behavior was good. Daric's mother asked Nate's teacher if she could send home a positive note with Nate because he was acting out at home instead of Daric. The dynamic appeared to change, depending on the reaction the boys received from the adults in their environment.

#### Classroom Behaviors

Problem behaviors were evident since the beginning of the year. Conferences were held, and different techniques were tried. A simple behavior-modification technique was used between the fall and spring conferences, a period of 5 months. Only temporary and erratic gains were made. Daric still had difficulty with his attention span and work habits. Rarely did he finish his work. His teacher administered the School Situations Questionnaire to determine if Daric was hyperactive. The score he received on the questionnaire was high enough to warrant the use of a more discriminating scale, the Teacher Rating Scale, which differentiated three areas: (a) conduct, (b) hyperactivity, and (c) passivity and

inattention. Daric's highest score was on hyperactivity. During the spring conferences, it was recommended that Daric consult a physician to pursue the use of medication for hyperactivity. The possibility of success of this treatment might make his school career more constructive. Daric's mother accepted the suggestion, and later he was put on Ritalin. Effects of the medication were somewhat evident, but long-term change was not evident because he began taking medication the last 2 weeks of school.

#### Indicators of Self-Concept

Daric was given the Harter and Pike Pictorial Scale. He consistently fell below the mean on all four domains: cognitive competence, peer acceptance, physical competence, and maternal acceptance. He fell the furthest below the class mean on maternal acceptance. Intraindividual differences were interesting. His highest score was in cognitive competence, and his lowest scores were in maternal and peer acceptance (both 2.83). It appears that Daric's feelings of efficacy were stronger in the cognitive areas than in the affective areas. Daric's self-concept in relationship to the other students in the class was below the class mean.

Daric was also given the SPIES and scored strongly in the direction of external control. He scored well below the group mean. Apparently he took his directives from adults and other external forces in the environment. He did not listen to or follow inner directives.

### Coping Style and Response to Frustration

The coping style Daric used was to become the center of attention. Daric usually had several other students near him, and he usually engaged them in quite interesting conversations. At school, he also handled his frustrations by acting out aggressively (i.e., through biting, throwing, and hitting). The psychologist noted another means of coping--shyness. One of the characteristics about which Daric's mother expressed concern, along with aggressiveness, was excessive shyness. This behavior was not apparent in the school milieu, but apparently it had manifested itself in other circumstances.

Daric initially appeared to handle himself well in a new situation. For instance, he was able to separate easily from his mother for the testing sessions, and he was attentive and cooperative during this sessions (an adult-directed endeavor). Daric did experience some trauma when his mother went to the hospital for a week. Otherwise, no traumatic situations seemed to have been part of Daric's first 5 years.

### Summary

Daric coped with this problem by being very social and, at times, disruptive. Activities in the school environment seemed to call to him equally, and he appeared unable to differentiate between what was valuable and what was not valuable. For instance, a noise in the hall called to him as much as did the work that was in his attentional field. This is true for many children, but it was

consistently true for Daric. Although his home life was supportive, situations at school were disturbing enough to cause him difficulty in his school work. He appeared to be an externally directed child and was unable to persist to task completion unless an adult was helping him follow through. Daric's patterns of attn/con were not constructive. The longest he was able to stay on task was 4 minutes. His attention patterns (see Tables 4.1 and 4.2) were very sporadic and prone to much distraction.

#### Case Study 2: Liza

##### Physical Description

Liza was a tall, slender blonde. She had large amounts of energy and an easy smile. At times, she projected a craggy image when her shoulders were hunched over and she was involved in something. Her eyes were blue and very quick, and her hands were long and slender. She liked movement, and she quickly reacted to stimuli in the classroom environment. She was quick to understand and easily comprehended new ideas. When she understood, her whole body became animated and excited. Head shakes came easily, and body response was appropriate and immediate. Liza's most pronounced characteristics were her ready smile, long straight blonde hair, quick blue eyes, and responsive motor movements.

##### Family Background

Liza lived in a suburb. Her father was an attorney, and her mother was a homemaker. She had one brother, who was 3 years



younger than she was. The home environment was very supportive of Liza's interests, and individualized education was valued. The results of the PPAS suggested that Liza's expression of her feelings was of most importance of them. The two qualities, autonomy and uniqueness, received the same score. The overall score was above the classroom mean. On the maternal acceptance domain of the Pictorial Scale, Liza scored well above the classroom mean and the mean of Harter and Pike's (1984) study.

In general, Liza appeared to have an upper-middle-class existence. The family valued individualized instruction and were willing to pay for what they considered to be quality education. The household had two parents, and it appeared that Liza's social, emotional, physical, and intellectual needs were met.

#### School Environment

For the duration of the study, Liza attended the same Montessori school as Daric did. In the morning, Liza was in a preschool classroom of 17 children whose ages ranged from 2-1/2 to 6 years. In the afternoon, she was with 11 other 5 year olds in what was called an extended-day classroom. The extended-day portion of their day consisted largely of free choice in work, but it was somewhat academically oriented. Liza liked school, especially the social aspect. Once a week, Liza missed school to attend dance classes. She had freedom of movement within the classroom limitations, and numerous hands-on activities were present in the classroom.

### Skill Areas

Language. In the evaluation report of the WPPSI, it was noted that

Liza's strengths, as indicated by the testing, appear to be in her ability to formulate verbal concepts. Included in this strength is verbal fluency and a fine associative ability. Another strength is her visual motor coordination combined with a good visual memory.

Also, in the final year-end evaluation, the teacher stated, "She expresses herself well in group share activities. She has an excellent foundation for reading. Liza has a good blend of phonetic skills and sight reading skills."

Pre-math and math. According to the final student evaluation, Liza had essentially mastered the pre-math areas and was able to read four-digit numbers. She was able to handle addition problems, and multiplication concepts were presented as well. Also, skills in linear counting were developing nicely.

Overall intellectual evaluation. Evaluation from the WPPSI stated that Liza was functioning intellectually at the "very superior" level and was in approximately the top 2% of the standardized population at her age level. Her strengths were her verbal concept formation, which included an ability to see relationships between objects in her environment. Her weaker area was her attention to detail and discerning essential from nonessential detail. The informal observations from the WPPSI noted that Liza appeared to be a well-adjusted and inquisitive 5 year old. When working through a problem, she slapped her head and said, "Oh!"

Evidently, she had discovered something. Her whole body became involved in her thinking process. At times, it was comical. Liza's attention span and persistence to task were excellent, and she seemed to enjoy a healthy challenge. Although she did some wiggling, Liza did not ask for a break; generally, her energy level was good. She asked numerous questions, but not all of them were answered to her satisfaction. She continued to ask more probing questions to satisfy her curiosity. Liza's Verbal IQ was 141, her Performance IQ was 119, and her Full-Scale IQ was 134.

#### Activity Patterns and Patterns of Attention/Concentration

All through the 1985-86 school year, Liza had ample energy. She was highly social and was well-liked by the other children. When the day began, she usually made choices easily and persisted until her work was completed. In the final evaluation, Liza's teacher stated, "She chooses challenging work and will demonstrate a very good persistence to task. She is independent and has a good sense of order, and she has good internal control."

The results of the on-task/off-task evaluation of the 5 hours of videotapes showed that Liza was able to stay on-task for relatively long periods. Also, if she was interrupted (either by herself or another), she went back to her work and continued with the task until she had completed it. During the 5 hours of videotapes, Liza had two periods of "concentration," which in this study was defined as on-task behavior that lasted 5 minutes or





longer. The following is the description of that period of concentration:

**November 19, 1985**

**Choice of work:** Metal inset, a material designed as a preparation to handwriting. It helps perfect eye-hand coordination and use of the pencil, and it also functions as a basic design that makes geometric shapes.

**Exact time of the work cycle:** 11 minutes and 50 seconds--activity finished.

**Placement of the body:** on a chair, no other children around, eyes focused on the work.

**0 to 3 minutes and 32 seconds:** Clearly, this was Liza's choice. No teacher prompting was evident from the videotape. The orientation to her work came quickly. A noisy activity was next to her. At times, Andreas's head was about 2 inches from her elbow. Liza was oblivious. At one point, she stood up, looked at her work, made a determination, and sat down again.

**3 minutes and 32 seconds to 6 minutes and 25 seconds:** Liza got up to get a new piece of paper to continue her work. She immediately sat down, quickly oriented, and began working again. Her head followed the movement of her pencil. Her head was positioned way down with clear, direct, and intense focus on her work. Liza was oblivious to the noise around her.

**6 minutes and 25 seconds to 7 minutes and 32 seconds:** Liza moved her head in the direction of the noise but turned back to her work and continued with on-task behavior. She took her shoes off



and let them rest by the side of her chair. She got up and walked around the table and then sat down and went back to work.

7 minutes and 32 seconds to 9 minutes and 35 seconds: Liza moved her left leg out beyond the chair and made her body look like a "Y." She regained focus and positioned her head on her work. Liza's head appeared to respond to the various movements of her pencil. When she made a circle, her head made a slight circular movement. When she made a straight line, her head nodded slightly.

9 minutes and 35 seconds to 11 minutes and 50 seconds. At 9 minutes and 35 seconds, Liza went to the teacher and showed the teacher her work. At 10 minutes and 26 seconds, the work was clearly done, according to Liza's perception. Her movements were direct and final. She walked over to get out her folder so she could put her finished metal inset into it. She went back to the table and put the metal inset and the pencils on her tray and put them back on the shelf. At 11 minutes and 50 seconds into the activity, Liza was completely finished.

Figure 4.2 shows the number of on-task and off-task behaviors recorded from the 5 hours of videotaping done on Liza in the classroom. The notation NOS was made on the checklist when Liza was not visible on the screen. The percentage of time she was not on the screen is noted on the figure.

### Interactions With Others

Peers at school. Liza had a nice blend of being able to work by herself and also of being a friend. She was welcomed into the



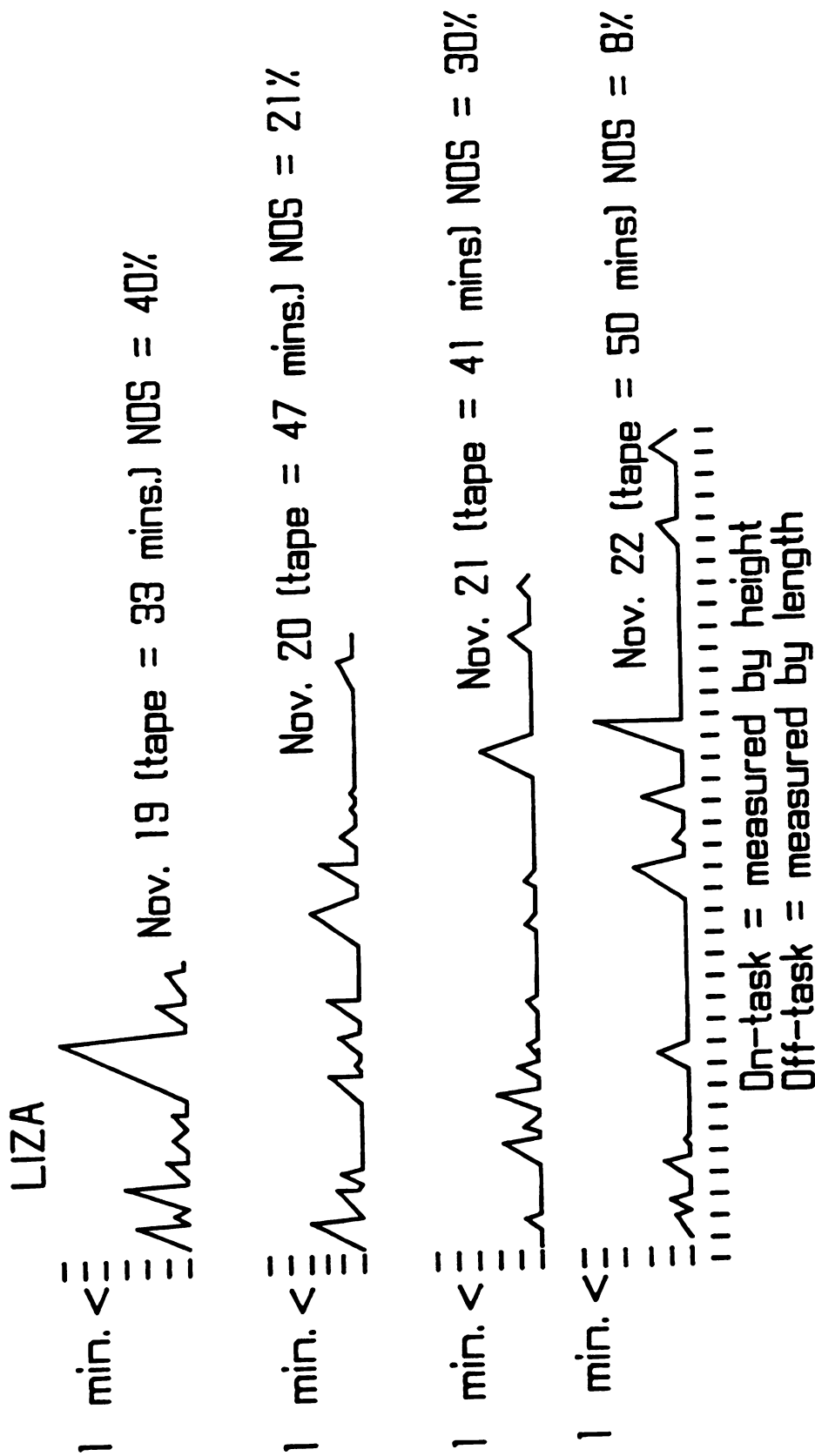
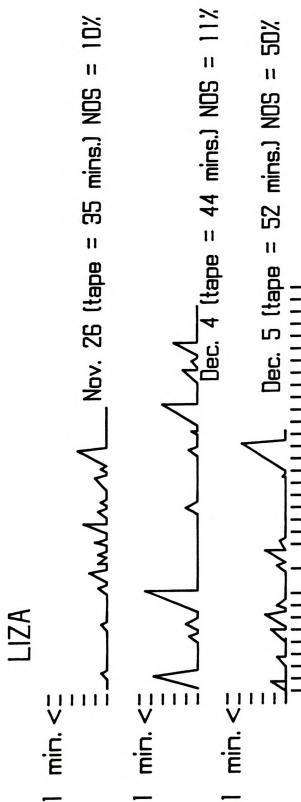


Figure 4.2: Incidence of Liza's task change.



On-task = measured by height  
Off-task = measured by length

Figure 4.2: Continued.





social groups with ease. Often she became the "helper." Another period of concentration (5 minutes or more of on-task behavior) was while she was helping a classmate with his initial sounds. With the same intensity, Liza completed the entire work cycle; she was the "teacher" in this situation. Aloneness appeared to be a choice for her rather than the status quo.

Parents. Liza's mother and father appeared to enjoy her. During the spring conferences, they did express concern for their son, who was 3 years younger than Liza. The mother noted on the Continuing Motivation Checklist that "every free minute I have, Liza wants me to play some sort of mind game with her--i.e., addition, subtraction, French, or states and capitols." Also on this checklist she noted that "Liza discusses her school day when she gets home with me and in the p.m. with her dad, and she does this every single day." Clearly, the parents supported Liza's continued interest in school, and she freely recounted the activities of the day.

Sibling. On November 19, Liza played school with her brother (according to the Continuing Motivation Checklist). The following week, her mother noted that Liza played swimming class with her brother. The relationship with her brother appeared to be one of the big sister sharing school activities with her younger brother. Liza seemed to be taking the role of "teacher" seriously in this situation.



### Classroom Behavior

Liza was a high-energy child. Even when she had on-task behavior, her movements at times seemed perpetual. She did not tire easily, and she made independent choices enthusiastically most of the time. She was able to choose to be alone or to be with a group. Liza was given the SSQ, and, in general, no classroom misbehaviors were noted. On problems during individual desk work, "1" was circled, indicating there was a "mild" concern over some of the disruptions she caused when at her desk. Clearly, although Liza had high energy and a high activity level, she could not be considered hyperactive because of her work habits, which included her persistence to task completion and her ability to stay on-task for a significant time. Generally, she had adapted well to the classroom routines and responded appropriately with the other children.

### Indicators of Self-Concept

The Harter and Pike Pictorial Scale, which measures perceived competence and social acceptance, determined Liza to be well above the mean of the class in all four domains: cognitive competence, peer acceptance, physical competence, and maternal acceptance. Her self-perception appeared to be strong. Intraindividual differences showed that her strongest self-perception was in the area of cognitive competence. The next strongest area was physical competence, and the other two domains (peer acceptance and maternal acceptance) had the same score. Again, it appeared that Liza's



strength was in the cognitive rather than the affective domain, although, across the board, she did very well in all four areas.

#### Coping Style and Response to Frustration

Most characteristic of Liza's learning style was her effective use of the adults (teachers) in her environment. When she was confused or frustrated with her school work, she appropriately solved her problems by asking the teacher for help. The skills necessary for soliciting aid included (a) being able to verbalize what her problem was; (b) being able to recognize when the teacher was available to answer her question; (c) when she had received an answer, determining if it did help her to continue working on her activity; and (d) if not, rephrasing the question and trying again. Liza appeared to have the verbal skills necessary to do this.

From the SPIES, Liza was determined to be an internally motivated individual. She took her directives from her own internal motivation rather than from the adults and other external forces in her environment. (See Table 3.3.) Therefore, when she was frustrated, Liza took it upon herself to solve her own problems.

#### Summary

Liza had superior verbal abilities, and this became apparent in how she conducted herself in the classroom. She helped other children, and she responded appropriately to the teacher and the other children in her classroom. Liza consistently persisted toward task completion and was able to attend to a task for a considerable



time. She was reflective and often planned out her work before she began. In the WPPSI evaluation it was noted,

Often she would organize her test materials first before she would proceed, and most frequently, a trial and error method was used in design construction. It was apparent to the examiner that she was able to mimic adult demonstrations with accuracy. Her attempts were characterized by unusual persistence and an ability to be reflective.

#### Discussion: Comparison of Daric and Liza

##### Physical Description

Some marked physical differences existed between Daric and Liza. Daric was male and Liza was female. Liza was relatively tall for her age, and Daric was relatively short for his age. Whereas Daric had brown eyes and brown hair, Liza had blue eyes and blonde hair. Both children had a high energy level; Daric's energy was not task oriented, whereas Liza's was task focused. The two children's mode of dress also differed somewhat. Daric wore clothes that were compatible with the out-of-doors. Liza, on the other hand, dressed in bows, flashy colors, and flamboyant jewelry. Liza's fingers were long, whereas Daric's were short and wide at the fingertips. Daric had a short, compact look; Liza had a long, lanky, sometimes craggy appearance. Both children had a very animated approach to experiences. Liza had a ready smile, and Daric had a mischievous cackle.

##### Family Background

Some basic differences were noted in the two subjects' family backgrounds, as well. Liza had a much younger brother. There might

have been some competition between the two siblings, but it would not match the apparent competition between Daric and his twin brother, Nate. This aspect of Daric's life seemed to be a confounding one for him. Liza did not appear to have this emotional stress.

Another difference was found in the occupations of the parents. Daric's father was essentially a blue-collar worker; his mother worked full time, as well. It is possible that the household was occasionally rushing, trying to meet the work demands and school expectations. Liza's household was different. Her father was a white-collar worker. Her mother did not work; she spent the day keeping the household running smoothly. From the Continuing Motivation Checklist, it was apparent that the parents took time daily to ask Liza about her day and to respond to her needs. Very possibly their household was as busy as Daric's, but the time was directed to dance lessons and other activities for the children, not to job priorities.

During the fall conferences, Liza's father asked which mode of discipline was used in the classroom. Daric's father suggested bringing in a squad of cops to scare Daric into shaping up. This lack of reflection might have been another confounding issue for Daric. In the long run, planful approaches to problems provide better solutions. Possibly Liza's father was more cognitively complex and, when discipline was necessary, used reason rather than the "scare tactics" Daric's father might use. Daric's and Liza's



different approaches to their tasks might have been a result of their parents' approaches to dealing with their problems.

### School Environment

The two children's school environment was essential identical. They both attended the same extended-day classroom at a Montessori school. Their social milieu might have differed, however. Socially, Daric briefly interacted with many classmates. Liza, however, chose to be alone a great deal of the time. She was asked over to play far more frequently than Daric. She seemed to hold onto friends longer than Daric did.

### Skill Areas

Differences between Liza and Daric were noted in the various skills. This might have been a result of Liza's greater ability to focus and absorb the meaning of an activity. She was better able to listen to and mimic a teacher's lessons when she decided to perform the activity. Table 4.1 shows the two children's results on the WPPSI, which was administered in November 1985.

Table 4.1: WPPSI Results for the Two Subjects, November 1985

Name	Performance IQ	Verbal IQ	Full-Scale IQ
Liza	119	141	134
Daric	110	122	118

Language. According to the year-end report, Daric was able to "express himself orally very well." The teacher also mentioned that he had good articulation. In the psychological and multidisciplinary evaluations, Daric usually scored a little better than average on the tests given. Liza, however, had superior language abilities. According to the year-end report, she was reading and had a good understanding of the material she read. On the other hand, Daric was not reading. He did not seem able to focus long enough to acquire the necessary skills for reading. However, this probably was a developmental characteristic and these skills will emerge in time.

Pre-math and math. Daric appeared to be doing somewhat better in math than in language. According to the year-end report, he had mastered counting from 1 to 100. The report also stated that he was doing simple addition with manipulatives. The year-end report indicated Liza had a good grasp of four-digit numbers and had done simple addition and multiplication with manipulatives.

Overall intellectual evaluation. From the evaluation following the WPPSI, it was determined that Daric was functioning intellectually at the "bright normal" level. He was at the 90th percentile, which means he was functioning in approximately the top 10% of the standardized population for children in his age range. Daric's greatest strengths were his perceptual organization and spatial visualization. Another strong area was his alertness to the



environment and the apparent richness of his early educational milieu. His weaker area was perception of details.

Liza, on the other hand, was functioning intellectually at the "very superior" level. She was at approximately the 98th percentile, meaning she was functioning in the top 2% of the standardized population of children her age. Liza's strengths appeared to be her ability to formulate verbal concepts, including verbal fluency and a fine associative ability. Another strength was fine visual motor coordination combined with a good visual memory. Liza's weaker area might have been in the ability to differentiate essential from nonessential details.

Daric had a typical trial-and-error approach to problem solving. Liza appeared to be able to learn through visual memory, auditory skills, and an ability to abstract verbal concepts. Despite these differences, according to the year-end report no major discrepancies existed between Liza's and Daric's school achievement.

#### Activity Patterns and Patterns of Attention/Concentration

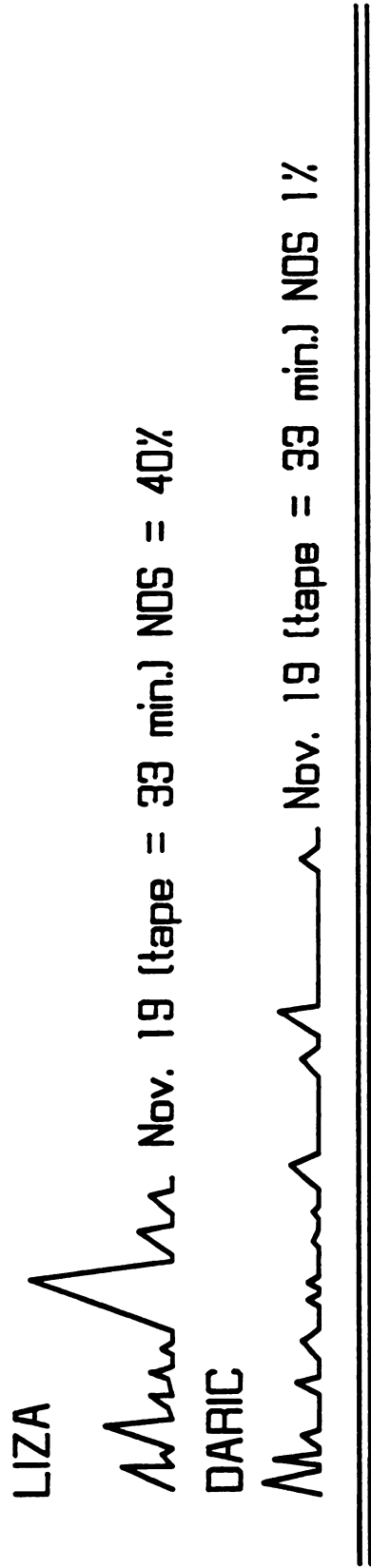
The two subjects differed most in this area of comparison. Therefore, these patterns might have been the factors contributing to the differences in skill levels and in appropriate classroom behavior. In the 5 hours of videotaping that was reviewed, Daric was not able to sustain attention any longer than about 4 minutes. On the other hand, Liza had two periods of concentration, one of which lasted more than 11 minutes. When looking at the differences between the two patterns of attn/con, it was seen that Daric's

superficial, flighty approach to tasks curbed his acquisition of skills. Liza had much higher peaks of involvement, which illustrated a longer time spent on self-chosen activities. Also, when looking at the graphs comparing Daric's and Liza's patterns of attn/con (Figure 4.3), it was apparent that Daric generally had more changes in movements. He moved from on-task to off-task more often than Liza. When she was on-task, she was on-task longer than Daric was. As well, when she was off-task she was off-task longer than Daric was. (See Figure 4.4, November 21, 22, and 26 and December 4 and 5). Daric's activity patterns appeared to be more erratic and indecisive than Liza's.

Concerning the differences in patterns of attn/con between a child determined to be hyperactive and a child determined to be nonhyperactive, the following determinations were made:

1. More activity change was evident with the hyperactive child (Daric).
2. A difference was found between the hyperactive child and the nonhyperactive child in terms of the frequency with which they had a continuous work session that lasted longer than 5 minutes.
3. Although the difference was only slight, the nonhyperactive child was on-task more of the time than the child determined to be hyperactive.

First, the hyperactive child changed more frequently from on-task to off-task orientation than did the nonhyperactive child. (See Table 4.2 and Figure 4.5.) Some variation was present from one



126

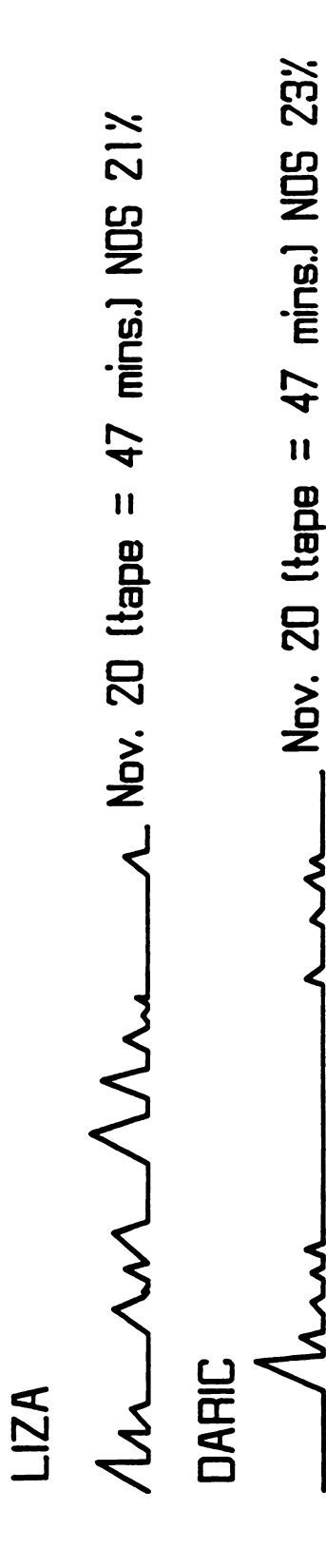


Figure 4.3: Comparison of Liza's and Daric's incidence of task change.

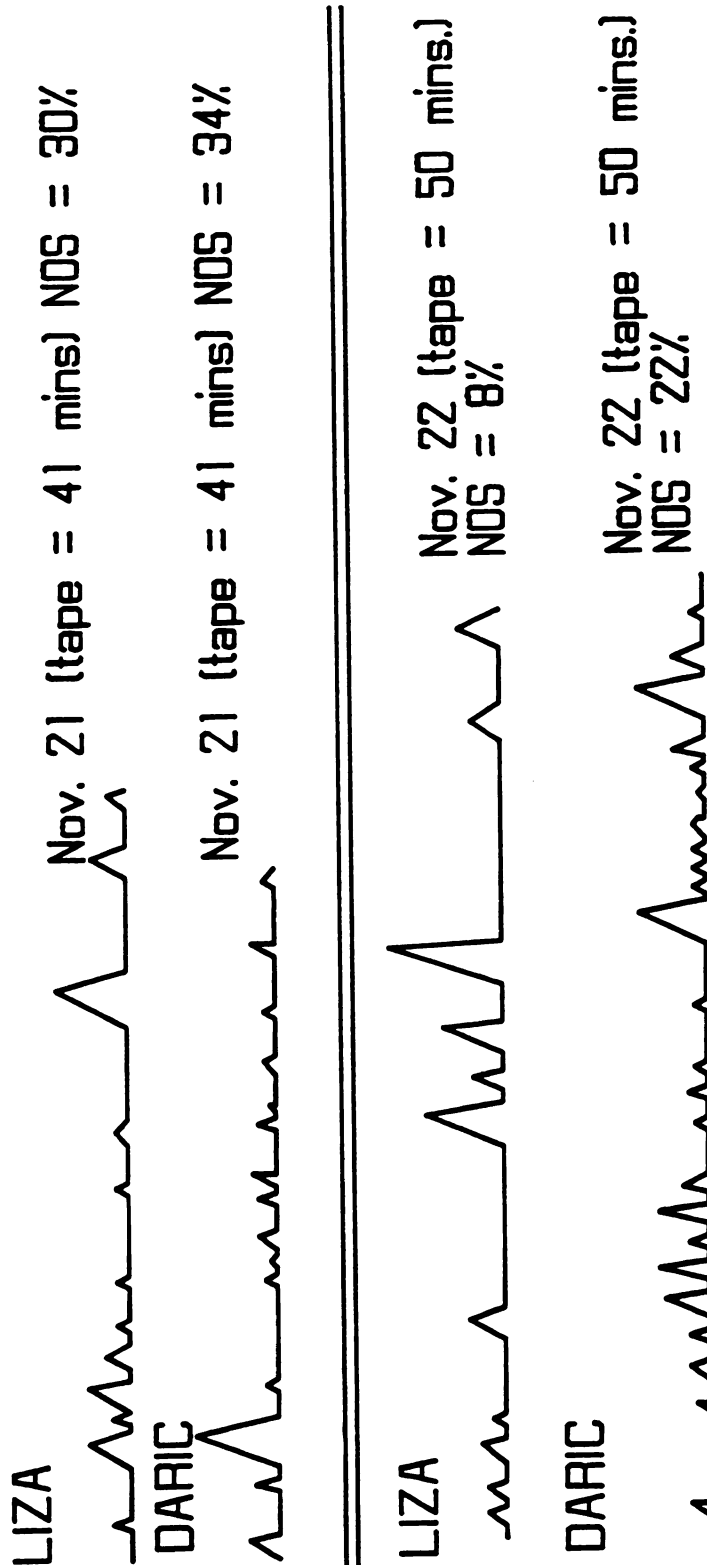


Figure 4.3: Continued.

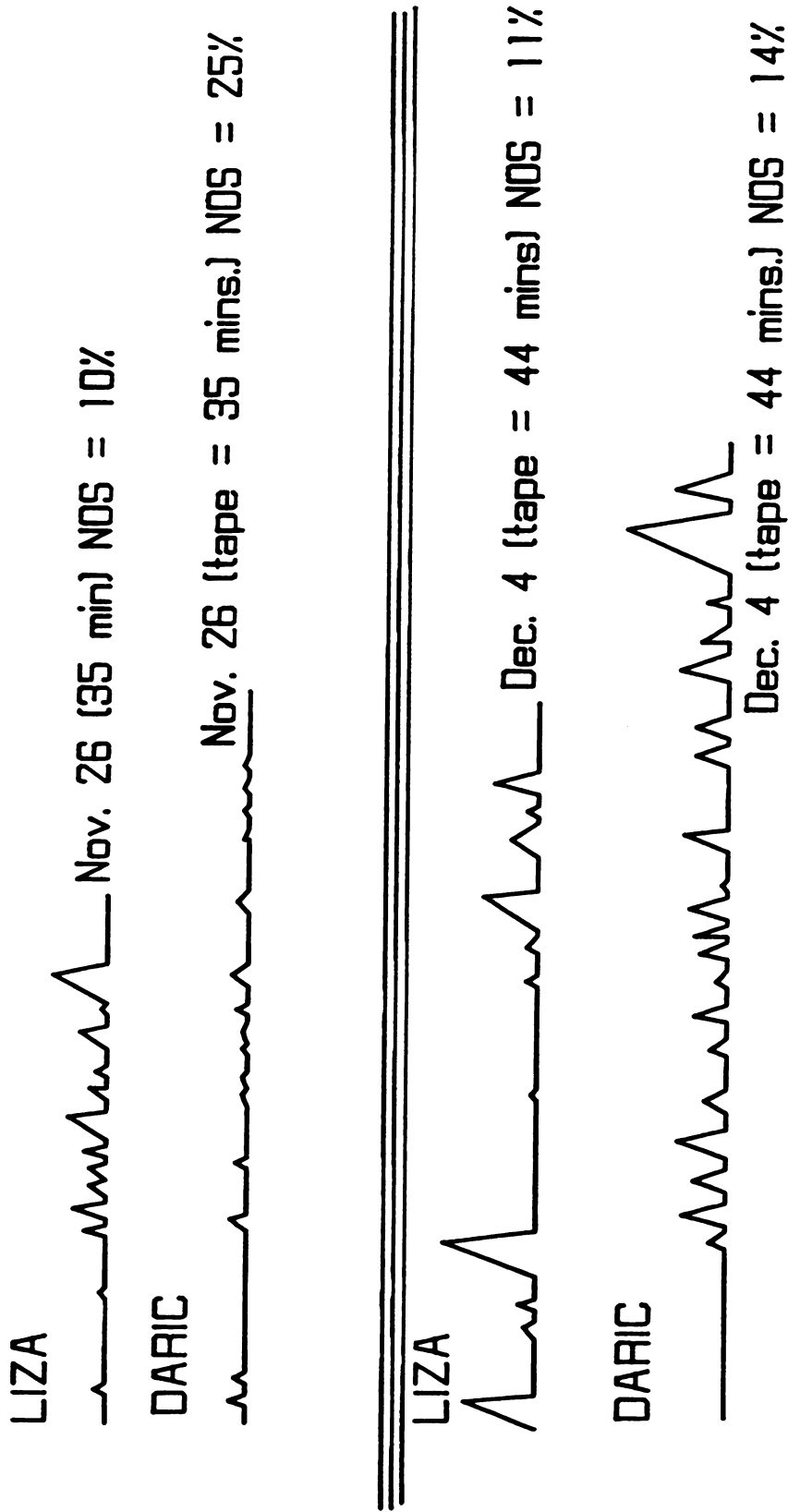


Figure 4.3: Continued.



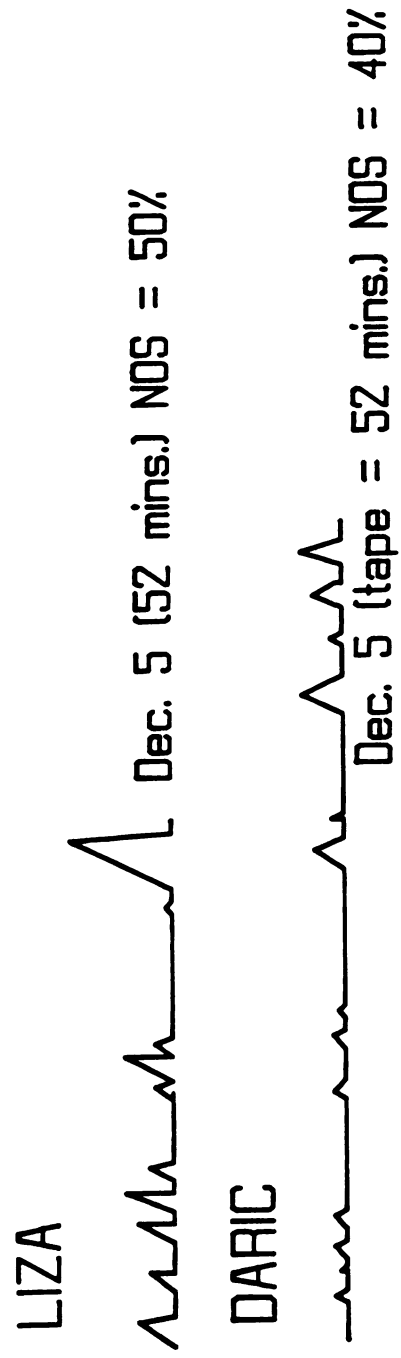


Figure 4.3: Continued.



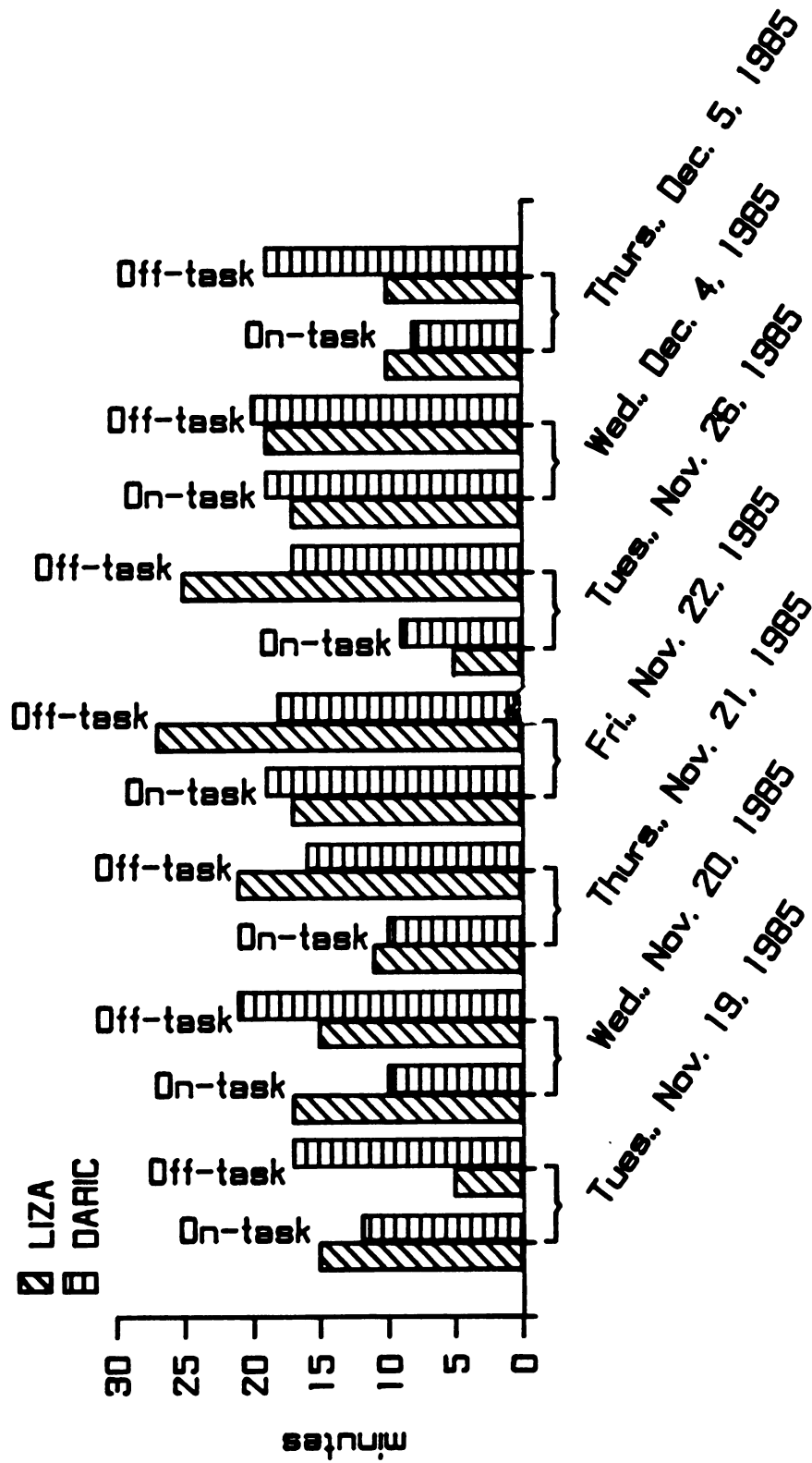


Figure 4.4: Comparison of Liza's and Daric's Incidence of On-Task and Off-Task Behavior.



Table 4.2: Changes in Orienting Activity

Date	Nonhyperactive Child (Liza)	Hyperactive Child (Daric)
November 19	14 changes	26 changes
November 20	26 changes	19 changes
November 21	24 changes	30 changes
November 22	22 changes	48 changes
November 26	26 changes	31 changes
December 4	21 changes	40 changes
December 5	19 changes	26 changes

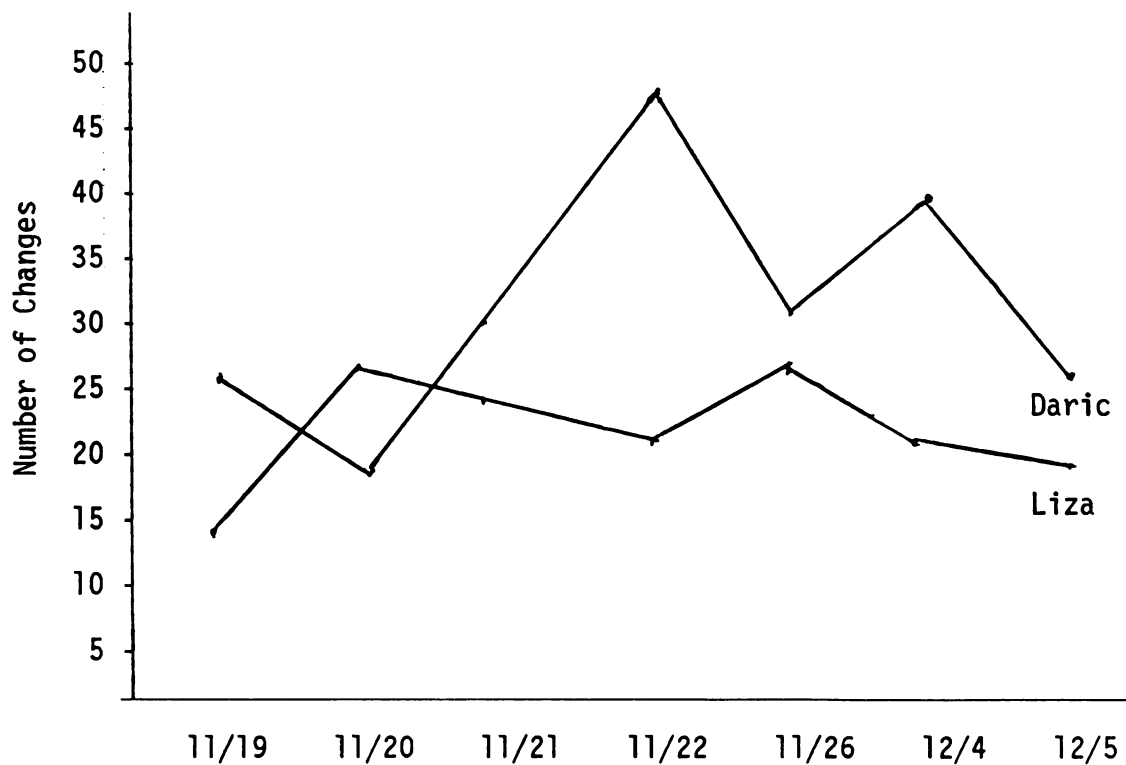


Figure 4.5: Incidence of task-orientation change.



day to another, but the hyperactive child had more changes from orientation to task to withdrawal from task orientation.

Second, a difference was found between the hyperactive child and the nonhyperactive child in terms of the amount of time spent in continuous work sessions. Periods that lasted 5 minutes or longer were behaviorally defined as periods of concentration. According to the videotapes that were analyzed, Liza had two periods of concentration (on November 19 and December 4). Daric, on the other hand, did not have any work sessions that lasted as long as 5 minutes. He moved into the off-task mode before he had concentrated 5 minutes.

Finally, it was found that Liza (nonhyperactive) was on-task more, but not substantially more, than Daric (hyperactive). (See Table 4.3.) Liza was on-task 32% of the time and Daric was on-task 31% of the time during the 5 hours of videotaping. Liza was off-task 42% of the time, whereas Daric was off-task 45% of the time. The difference in percentages of off-task behavior was greater than the difference concerning on-task behavior, but this discrepancy was not large enough to warrant firm conclusions. It was apparent that both subjects were motivated and that the difference was a result of task completions and the number of task changes.

Table 4.3: Percentages of Time On-Task and Off-Task

Name	On-Task	Off-Task	Not on Screen
Liza	32%	42%	26%
Daric	31%	45%	24%

### Interactions With Others

Daric had negative relations with his peers in school, particular at the beginning and end of the year. On the other hand, Liza seemed to be well-liked and steady and loyal about her peers and friends.

The two children differed in their relationships with parents, as well. Daric scored below the classroom mean on the maternal acceptance subscale of the Pictorial Scale, but Liza scored above the mean on that scale. Liza's relationship with her father appeared to be close because she daily shared with him what had transpired in school. Daric's relationship with his father also appeared to be strong. In the psychological report it was mentioned twice that Daric identified strongly with his father. Some inconsistency was apparent in the disciplining.

Daric's and Liza's relationships with their siblings also appeared to be quite different. Daric had a close competitor in his twin brother, whereas Liza became the "teacher" with her younger brother. Competition can bring out an individual's hostility,





whereas taking on the teacher role can foster some positive qualities.

#### Classroom Behavior

From the SSQ and Conner's TRS it was determined that Daric was hyperactive and Liza was nonhyperactive. Daric was unable to attend to tasks for any period of time, and he tended to instigate problems in the classroom. He managed to find children to collude with him in misbehavior at any time. Therefore, he could be a very negative influence in the classroom. In contrast, Liza played "teacher" and helped the other children when they needed assistance. She was responsible and knew how not to be overbearing. For the most part, Liza would be considered a compliant or "good student" and Daric would be considered a difficult one.

#### Indicators of Self-Concept

Both Daric and Liza considered their greatest strength to be their cognitive competence. Both of them fell down in the areas of peer and maternal acceptance. Daric scored below the class means on all four domains of the Pictorial Scale, whereas Liza scored above the means on those domains. At the end of the school year, Daric cheated in a game in music class. Possibly he thought he could not win fairly, and this might indicate a very low self-esteem. Further, Daric was easily put on the defensive, and he lashed out by biting his peers. This indicated he thought he could not compete on even terms and that the weapon of biting was his only recourse. Daric's inability to complete his work might have been due, in part,



to his lack of self-efficacy. Possible he thought he just could not finish his work. Liza, in contrast, had good work habits and felt confident of herself in the classroom environment.

#### Coping Style and Response to Frustration

Daric became aggressive or manipulated other children when he was responding to frustration. He found himself on the defensive most of the time, and his quick, erratic movements might have resulted from a fear of being confronted. In contrast, Liza used adults in the environment to help her solve the dilemmas she encountered. When her question had been answered, she would go back to work and persist to completion. Daric's mode of coping was self-defeating, whereas Liza's was constructive and helpful.

#### Relation of Findings to the Literature

Many of the findings of this study were confirmed by the review of literature regarding attn/con. Barkley (1982) and O'Malley and Eisenberg (1973) listed characteristics present in hyperactive children; among those characteristics were distractibility, impulsivity, and excitability. Further, Cantwell (1975) suggested that certain symptoms were present in only some cases. One of these symptoms, antisocial behavior, was characteristic of Daric because, at the beginning of the school year, he was biting other children. Thus, the findings of this study were consistent with current research.

Findings of research on locus of control were also corroborated in the present study. Daric had a lower score than Liza on the SPIES, which indicated Daric was externally controlled and Liza was internally controlled. Locus of control is a major factor in persistence to task (Lefcourt, 1982; Weiner & Kukla, 1970). Evidence from the case study suggested that Liza, who was internally controlled, had greater persistence to task than Daric, who was externally controlled. Also, Hiroto (1974) found that "externals" thought luck or chance determined their answers, whereas "internals" believed they controlled their own reinforcers. Hiroto found this perception of control to be a factor in how passive or motivated the individual was. From the case-study information, both Liza and Daric appeared to be motivated. Liza was motivated to complete academic tasks, whereas Daric treated both academic and nonacademic tasks with equal importance. DeCharm's (1976) Origin-Pawn theory also applies to Daric and Liza. Because Daric was unable to finish his tasks, the teacher became more directive, and Daric had fewer opportunities to be an Origin. Liza could complete tasks, so she had more opportunities to originate her work choices. In her case, the teacher became less directive because Liza was able to initiate and successfully to complete a work cycle on her own.

Findings of Bandura's (1986) research on self-efficacy also were consistent with the findings of the present study. Bandura postulated that the two variables that affect an individual's motivation are efficacy expectations and outcome expectations. Efficacy expectations are the individual's convictions that he/she

can successfully perform the necessary behavior to produce the outcome. Outcome expectations are the person's belief that a given behavior will lead to a certain outcome. The test used to measure perceived competence and social acceptance was the Pictorial Scale. Daric was below the mean on all four domains measured by this scale, whereas Liza was above the mean on these domains. This discrepancy, in part, explains Daric's inability to proceed to task completion and Liza's ability to finish her self-chosen tasks.

The importance of parental acceptance, as suggested by the literature (Battle & Lacey, 1973; Bettelheim, 1973), was confirmed in this study. In the Fels Longitudinal Study, mothers of hyperactive male infants were found to be critical of their difficult babies during infancy. They were disapproving during later preschool years, and these children had difficulty adapting to school. Although Daric's and Liza's scores on the PPAS did not differ appreciably, a difference was found on the maternal acceptance domain of the Pictorial Scale. Daric's lowest score on the Pictorial Scale was in maternal acceptance. Also, comments made during the parent-teacher conferences and in the psychological evaluation suggested that Daric's mother was frustrated with him.

#### Related Findings

From viewing the videotapes and from the case studies, the researcher gained further insights, which are discussed in this section. These findings are both directly and indirectly related to the research questions.

1. It was evident from observing the videotapes that the two subjects had days that went well in terms of activity choice and task processing and other days that did not go as well. The videotapes for Tuesday, November 26, showed very little on-task time for either Daric or Liza (Daric = 9 minutes on-task; Liza = 5 minutes on task). This could have been because the Thanksgiving holiday week-end was beginning the next day. Daric also had a low on-task day on November 20. Perhaps he was not feeling well or something had occurred in the morning preschool class or at home that had influenced his ability to focus.

2. Another point of interest was the different ways the two subjects used the teacher in the classroom. Liza usually approached the teacher when she was frustrated with her work. Also, just before resuming on-task work, Liza would frequently approach a teacher, almost as if she were "recharging her batteries." Liza seemed to use the adult in the environment as her guide and as someone to keep her moving in the right direction. Daric, on the other hand, rarely used the adult as a resource. If he was frustrated with or confused about his work, he would avoid the frustration and begin talking with his friends or walk away from the problem. He did not appear to be "help seeker." The teacher contact that Daric had was often negative (i.e., reminders to go back to work and reprimands for handling the material destructively or interrupting other students).

3. Differences in task orientation and task completion between the hyperactive child and the nonhyperactive child became evident from viewing the videotapes. Liza completed seven more self-chosen tasks than Daric did--12 tasks in comparison to Daric's 5. In the final analysis, Liza was able to persist to task completion; Daric did so, but somewhat infrequently.

4. Liza had a higher score than Daric on the SPIES, which suggests that she was more internally controlled than Daric. Neither Liza nor Daric was at either extreme of the range, but Daric did represent the lower end and Liza the higher end of the continuum. Daric appeared to follow external directives, whereas Liza was self-directed, following an internal guide. Differences in locus of control and in task orientation were consistently seen in the subjects' varied approaches to their work, as well as in other test results (i.e., the WPPSI and their ability to be reflective).

5. According to their responses on the PPAS, Daric's parents considered his autonomy to be the most important quality; his feelings were the second priority. Liza's parents considered expression of feelings to be the most important priority; second was a tie between autonomy and uniqueness.

6. On the Harter and Pike Pictorial Scale, a significant difference was found between Daric and Liza. Liza scored high on all four domains: cognitive competence, peer acceptance, physical competence, and maternal acceptance. Daric was below the class mean on these subtests. The findings suggest that, as Bandura (1981) noted, when one has a strong sense of self-efficacy, his/her



persistence to task is stronger. When one believes he/she can do something, it is very likely that he/she will do it. Liza's and Daric's highest score was in cognitive competence. Their second highest score was in physical competence. Liza's two lowest scores were in the affective domains, peer and maternal acceptance. Daric's lowest score was in peer acceptance, and his second lowest was in maternal acceptance.

7. Some of Daric's intraindividual differences included his facility with language, in contrast to his spatial relations and accuracy with detail. On the McCarthy and the Peabody instruments, Daric received an average score. On the Preschool Attainment he received a higher score. Daric scored at the 5-1/2 year equivalency level on items concerning personal information and factual knowledge. Daric's results on the Bender Gestalt personality measure suggested that he was quite undisciplined, was interested in expressing his own feelings, and did not like following directions. The psychologist suggested that, rather than having a short attention span, Daric attended very well to tasks of his own choosing. The data from the videotapes suggested otherwise. Daric was not able to attend to any self-chosen task for longer than 5 minutes. These observational data suggested that Daric was unable to stay on task for a significant time. Daric's performance on the Rorschach suggested that he showed more creativity than the average child his age. He also showed considerable preoccupation with violence, blood, fire, monsters, and threatening forces. In



summary, Daric's strength appeared to be in the verbal area. His highest scores were on the information, arithmetic, and comprehension subtests of the WPPSI. His weaker areas were in perception of detail and being able to discern essential from nonessential details. From the Pictorial Scale, it was evident that Daric felt competent in the cognitive and physical areas. In the affective domains (peer and maternal acceptance), Daric seemed to have less feeling of self-efficacy.

8. Liza exhibited intraindividual differences, as well. She helped her peers and used teachers to help her cope with frustration. She was reflective in her responses on the WPPSI and was able to preplan her approach to tasks. Liza's strength, as indicated by testing results, appeared to lie in her ability to formulate verbal concepts. She was fluent and strong in word-association ability. Liza had good visual motor coordination combined with a good memory. Her weakest area on the WPPSI was picture completion, which suggests she had some difficulty discerning details. Other weaker areas were the geometric design and block design subtests, which might suggest she had some difficulty with spatial relations. Results on the SPIES showed that Liza had strong internal control, especially when dealing with positive events. The Pictorial Scale revealed that Liza had strong feelings of self-efficacy in the cognitive and physical domains and had somewhat weaker feelings of self-efficacy in the affective domains--assessed by the maternal and peer acceptance subtests. Essentially, Liza's strong areas were

language, her internal control, and her strong feeling of self-efficacy.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND IMPLICATIONS

This chapter contains a summary of the study, conclusions based on the findings, and implications for further research.

#### Summary

In conducting the study, the writer focused on the following two research questions:

1. What are the differences in patterns of attn/con between a child determined to be hyperactive and another child determined to be nonhyperactive?
2. When considering these two subjects, what are their intra-individual and interindividual differences?

The two criterion variables that were used to select the subjects were IQ and hyperactivity. The subjects were chosen on the basis of similar IQs and differences in scores on tests for hyperactivity (the SSQ and Conner's TRS). Subjects with similar IQs were chosen to rule out the possibility that differences in attn/con might be attributable to variations in intellectual functioning. The descriptive variables used to examine intraindividual and interindividual differences between the two subjects included (a) locus of control, (b) perceived competence and social acceptance,

and (c) parental acceptance. The outcome variable was the length and frequency of attn/con of the two subjects. The first research question was addressed in terms of the outcome variable, and the second question was addressed in terms of the descriptive variables.

The investigative approach used in this study generated substantial information regarding the attn/con patterns of the two subjects, Daric and Liza. These data were generally consistent with the existing research findings on hyperactivity and its clinical descriptions: (a) distractibility and an inability to persevere with homework and classroom assignments, (b) impulsivity (failure to think before one acts or speaks), and (c) excitability (throwing temper tantrums, fighting over trivial matters, or having a low tolerance for frustration). These characteristics are especially noticeable when a hyperactive child is in groups with other children (O'Malley & Eisenberg, 1973). The following symptoms are also present in some cases: (a) antisocial (aggressive) behavior, (b) specific learning disabilities (i.e., problems with learning to read), and (c) some depressive symptoms that are exacerbated by low self-esteem (Cantwell, 1975). These symptoms were present in Daric and were revealed through the information compiled for his case study.

### Conclusions

The case studies and the analysis of on-task and off-task behaviors from the 5 hours of videotapes revealed some differences between Liza and Daric. Liza had more on-task and fewer off-task

behaviors than Daric. Further, she had more episodes of concentration (on-task behaviors 5 minutes or longer). Conversely, Daric had fewer on-task and more off-task behaviors. A marked difference between the two subjects was observed in the number of changes in their task orientations. Liza moved from on-task to off-task behaviors and vice versa much less frequently than Daric did. In fact, the most interesting finding of this study was the number of task changes that Daric made. Daric and Liza also differed in terms of overall time on task, but the difference was small. In addition, Daric did not have extended concentration (Liza had an 11-minute period of concentration, whereas Daric never reached a 5-minute period).

From the study findings, it was concluded that Daric, a hyperactive youngster, was similar to Liza in time on task, but Daric differed appreciably from Liza in the frequency with which he changed his task orientation from on-task to off-task and vice versa. The researcher also concluded that the amount of difference between Liza and Daric in time spent on on-task and off-task behaviors would not warrant making generalizations about hyperactive and nonhyperactive youngsters beyond these case studies unless the individuals were similar to Daric and Liza.

The literature on hyperactivity and the findings of this study confirmed the clinical definition of hyperactivity. Findings of previous research were corroborated in this study with regard to (a) locus of control and persistence to task, (b) self-efficacy (perceived competence and social acceptance), and (c) maternal and

peer acceptance. Findings of the present study did not support the notion that hyperactive youngsters have lower IQs than normal children. Also, whereas Daric did not appear to have had extensive trauma in early childhood, previous researchers had suggested that hyperactive children usually experience traumas in their early development. Finally, the findings of this study confirmed that Daric had a greater incidence of task change than did the nonhyperactive subject.

#### Implications for Further Research

1. Further research is needed on the subject of attn/con. Incidence of off-task and on-task behavior provided a minimum of information. Future researchers need to focus on depth of task processing and task completion, rather than just on on-task and off-task behaviors. Efficiency of task processing is the content of attn/con and should be investigated further. A scale might be devised that could measure the depth of task involvement. More research using the direct-observation method is also needed.

2. The study findings supported the notion that hyperactive children exhibit a greater incidence of task change than do nonhyperactive children. The next question might be, Why is this so? Understanding why this is the case might provide insights to help prevent or remediate the problems that hyperactive youngsters have in the classroom.

3. The finding that the hyperactive youngster was a "help avoider" whereas the nonhyperactive subject was a "help seeker"



might have interesting implications for further research. In this study the "help seeker" used the adults in her environment effectively; the hyperactive "help avoider" created problems in the classroom and did not know how to solve them. Determining whether a child is a "help-seeker" or a "help avoider" might help educators prevent problems at the beginning of a child's school career. Perhaps a training program could be introduced at the beginning of the school year to teach children how to "use" the teacher in the classroom environment.

4. Further considerations can be made regarding Daric's "inner life." The psychologist's report stated that the Rorschach Test that Daric had been given "showed more preoccupation with violence, blood, fire, monsters, and threatening forces." Preoccupation with this inner terror could have disrupted Daric's on-task behaviors. Further, Daric's task switching might have been due to this "inner life." The activity that Daric chose might not have quelled his inner restlessness. In an attempt to find an inner calm, he might have chosen another activity. Quite possibly, he changed activities often, hoping to quiet his internal confusion and fear.

5. With the assumption that task switching inhibits the processing necessary for task completion, it is important to ask how teachers can decrease the incidence of task switching in problem students in the classroom. From this research, it might be inferred that one's self-efficacy and one's locus of control can either increase or decrease persistence to task. Task switching in Daric's

case occurred before he had completed his previous task. This being the case, the teacher's verbally reinforcing Daric's effectiveness could increase Daric's persistence to task. As Bandura (1982) suggested, "When beset with difficulties, people who entertain serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenge" (p. 211). Initial monitoring by a helpful adult could enhance Daric's positive self-statements as he approaches a difficult task.

Further, an individual's locus of control can determine his/her persistence to task. When an individual follows directives from within (self-orders), it is more likely that self-chosen tasks will provide more enjoyment and longer task processing. To enhance internal locus of control, these suggestions might be helpful: (a) classroom curriculum could encourage freedom of choice, which would be incorporated within the structure of the curriculum; (b) discipline in the classroom could have as its goal the individual's self-control--for example, allowing the child to determine when he/she can refrain from misbehavior. Ultimately, this removes some of the teacher control and places it on the child. It is hoped that, as a result, the child will reflect on his/her misbehavior and make a serious choice in his/her determination to resume classroom activities.

6. Finally, classroom environments can be changed to promote longer periods of on-task behaviors. Large blocks of uninterrupted time could help some children increase their periods of attn/con.

Also, teacher interventions could be kept at a minimum to allow students to process their chosen activities independently. Having instructional materials that are complete, in good repair, and developmentally appropriate can enhance periods of attn/con. With these guidelines, children can approach classroom work more confidently, with a greater interest in task completion.

## APPENDICES

## APPENDIX A

### THE SCHOOL SITUATIONS QUESTIONNAIRE

## THE SCHOOL SITUATIONS QUESTIONNAIRE

Name of Child \_\_\_\_\_

Name of Person Completing This Form \_\_\_\_\_

Does this child present any behavior problems for you in any of these situations? If so, indicate how severe they are.

Situation	Yes/No (Circle one)		If yes, how severe? (Circle one)								
			Mild			Severe					
	Yes	No	1	2	3	4	5	6	7	8	9
While arriving at school											
During individual desk work	Yes	No	1	2	3	4	5	6	7	8	9
During small-group activities	Yes	No	1	2	3	4	5	6	7	8	9
During free-play time in class	Yes	No	1	2	3	4	5	6	7	8	9
During lectures to the class	Yes	No	1	2	3	4	5	6	7	8	9
During recess	Yes	No	1	2	3	4	5	6	7	8	9
During lunch	Yes	No	1	2	3	4	5	6	7	8	9
While in the hallways	Yes	No	1	2	3	4	5	6	7	8	9
While in the bathroom	Yes	No	1	2	3	4	5	6	7	8	9
During field trips	Yes	No	1	2	3	4	5	6	7	8	9
During special assemblies	Yes	No	1	2	3	4	5	6	7	8	9
While on the bus	Yes	No	1	2	3	4	5	6	7	8	9

## APPENDIX B

### CONNER'S TEACHER RATING SCALE

IV. Listed below are descriptive terms of behavior. Place a check mark in the column which best describes this child. ANSWER ALL ITEMS.

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
<b>CLASSROOM BEHAVIOR</b>				
1. Constantly fidgeting				
2. Hums and makes other odd noises				
3. Demands must be met immediately—easily frustrated				
4. Coordination poor				
5. Restless or overactive				
6. Excitable, impulsive				
7. Inattentive, easily distracted				
8. Fails to finish things he starts—short attention span				
9. Overly sensitive				
10. Overly serious or sad				
11. Daydreams				
12. Sullen or sulky				
13. Cries often and easily				
14. Disturbs other children				
15. Quarrelsome				
16. Mood changes quickly and drastically				
17. Acts "smart"				
18. Destructive				
19. Steals				
20. Lies				
21. Temper outbursts, explosive and unpredictable behavior				
<b>GROUP PARTICIPATION</b>				
22. Isolates himself from other children				
23. Appears to be unaccepted by group				
24. Appears to be easily led				
25. No sense of fair play				
26. Appears to lack leadership				
27. Does not get along with opposite sex				
28. Does not get along with same sex				
29. Teases other children or interferes with their activities				
<b>ATTITUDE TOWARD AUTHORITY</b>				
30. Submissive				
31. Defiant				
32. Impudent				
33. Shy				
34. Fearful				
35. Excessive demands for teacher's attention				
36. Stubborn				
37. Overly anxious to please				
38. Uncooperative				
39. Attendance problem				

Reproduced, by permission, from C. Keith Conners.



APPENDIX C

THE PICTORIAL SCALE OF PERCEIVED COMPETENCE AND  
SOCIAL ACCEPTANCE FOR YOUNG CHILDREN  
INDIVIDUAL RECORDING AND SCORING SHEET, FORM 1-2



**The Pictorial Scale of Perceived Competence  
and Social Acceptance for Young Children\***  
**Individual Recording and Scoring Sheet, Form 1-2**

Child's Name \_\_\_\_\_ Age \_\_\_\_\_ Gender: M F

Class/Grade \_\_\_\_\_ Teacher \_\_\_\_\_ Testing Date \_\_\_\_\_

Item Order and Description	Cognitive Competence	Peer Acceptance	Physical Competence	Maternal Acceptance
1. Good at numbers	1 _____			
2. Friends to play with		2 _____		
3. Good at swinging			3 _____	
4. Eats at friends				4 _____
5. Knows alot in school	5 _____			
6. Others share		6 _____		
7. Good at climbing			7 _____	
8. Mom takes you places				8 _____
9. Can read alone	9 _____			
10. Friends to play games with		10 _____		
11. Good at bouncing ball			11 _____	
12. Mom cooks favorite foods				12 _____
13. Good at writing words	13 _____			
14. Has friends on playground		14 _____		
15. Good at skipping			15 _____	
16. Mom reads to you				16 _____
17. Good at spelling	17 _____			
18. Gets asked to play by others		18 _____		
19. Good at running			19 _____	
20. Stays overnight at friends				20 _____
21. Good at adding	21 _____			
22. Others sit next to you		22 _____		
23. Good at jumping rope			23 _____	
24. Mom talks to you				24 _____

Column (Subscale) Total:

Column (Subscale) Mean:  
(Total Divided by 6) \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

**Comments:**



APPENDIX D

THE STANFORD PRESCHOOL INTERNAL-EXTERNAL SCALE (1)



## THE STANFORD PRESCHOOL INTERNAL-EXTERNAL SCALE (1)

1. When you are happy, are you happy  
1+(a) because you did something fun, or  
(b) because somebody was nice to you?
2. When somebody tells you that you are good, is that  
1+(a) because you really have been good, or  
(b) because he is a nice person?
3. Do you think I brought you to the surprise room (experimental room)  
1+(a) because you have been good today, or  
(b) because I'm just a nice guy (lady)?
4. When your mother gives you a cookie, is that  
1+(a) because you need a cookie, or  
(b) because she has too many cookies?
5. When somebody brings you a present, is that  
1+(a) because you are a good boy (girl), or  
(b) because they like to give people presents?
6. When you draw a whole picture without breaking your crayon, is that  
1+(a) because you were very careful, or  
(b) because it was a good crayon?
7. If you had a shiny new penny and lost it, would that be  
1-(a) because you dropped it, or  
(b) because there was a hole in your pocket?
8. When you are sad and unhappy, are you sad and unhappy  
1-(a) because you did something sad, or  
(b) because somebody wasn't very nice to you?
9. When you play a game and lose, do you lose  
1-(a) because you just didn't play well, or  
(b) because the game was hard?
10. When somebody stops playing with you, is that  
1-(a) because he doesn't like the way you play, or  
(b) because he is tired?
11. When you get a hole in your pants, is that  
1-(a) because you tore them, or  
(b) because they wore out?

12. If you had a pet turtle and he ran away, do you think that  
would be  
1-(a) because you did something to make him leave, or  
(b) because there was a hole in his cage?
13. When you are drawing a picture and your crayon breaks, is that  
1-(a) because you pushed too hard, or  
(b) because it was a bad crayon?
14. When you can't find one of your toys, is that  
1-(a) because you lost it, or  
(b) because somebody took it?





## APPENDIX E

### THE PORTER PARENTAL ACCEPTANCE SCALE



## PPAS

Listed below are several statements describing things which children do and say. Following each statement are five responses which suggest ways of feeling or courses of action.

Read each statement carefully and then fill in on the enclosed answer sheet that circle that represents the one response which most nearly describes the feeling you believe you usually had or the course of action you think you most generally took when your child said or did these things.

It is possible that you may find a few statements which describe a type of behavior which you think you may never have experienced with your child. In such cases, mark the response which most nearly describes how you think you would have felt or what you think you would have done.

Be sure that you answer every statement and mark only one response for each statement.

1. When my child would be shouting and dancing with excitement at a time when I want peace and quiet, it would:
  - a. Make me feel annoyed
  - b. Make me want to know more about what excites him/her
  - c. Make me feel like punishing him/her
  - d. Make me feel that I will be glad when she/he is past this stage
  - e. Make me feel like telling him/her to stop
2. When my child would misbehave while others in the group she/he is with are behaving well, I would:
  - a. See to it that she/he behaves as the others
  - b. Tell him/her it is important to behave well when she/he is in a group
  - c. Let him/her alone if she/he isn't disturbing the others too much
  - d. Ask him/her to tell me what she/he would like to do
  - e. Help him/her find some activity that she/he can enjoy and at the same time not disturb the group
3. When my child would be unable to do something which I think is important for him/her, it would:
  - a. Make me want to help him/her find success in the things she/he can do
  - b. Make me feel disappointed in him/her
  - c. Make me wish she/he could do it
  - d. Make me realize that she/he can't do everything
  - e. Make me want to know more about the things she/he can do

4. When my child would seem to be more fond of someone else (teacher, friend, relative) than me, it would:
  - a. Make me realize that s/he is growing up
  - b. Please me to see his/her interest widening to other people
  - c. Make me feel resentful
  - d. Make me feel that s/he doesn't appreciate what I have done for him/her
  - e. Make me wish s/he liked me more
5. When my child would be faced with two or more choices and would have to choose only one, I would:
  - a. Tell him/her which choice to make and why
  - b. Think it through with him/her
  - c. Point out the advantages and disadvantages of each, but let him/her decide for himself/herself
  - d. Tell him/her that I am sure s/he can make a wise choice and help him/her foresee the consequences
  - e. Make the decision for him/her
6. When my child would make a decision without consulting me, I would:
  - a. Punish him/her for not consulting me
  - b. Encourage him/her to make his/her own decisions if s/he can foresee the consequences
  - c. Allow him/her to make many of his/her own decisions
  - d. Suggest that we talk it over before s/he makes his/her decision
  - e. Tell him/her that s/he must consult me first before making a decision
7. When my child would kick, hit, or knock his/her things about, it would:
  - a. Make me feel like telling him/her to stop
  - b. Make me feel like punishing him/her
  - c. Please me that s/he feels free to express himself/herself
  - d. Make me feel that I will be glad when s/he is past this stage
  - e. Make me feel annoyed
8. When my child would not be interested in some of the usual activities of his/her age group, it would:
  - a. Make me realize that each child is different
  - b. Make me wish s/he were interested in the same activities
  - c. Make me feel disappointed in him/her
  - d. Make me want to help him/her find ways to make the most of his/her interest
  - e. Make me want to know more about the activities in which s/he is interested
9. When my child would act silly and giggly, I would:
  - a. Tell him/her I know how s/he feels
  - b. Pay no attention to him/her
  - c. Tell him s/he shouldn't act that way
  - d. Make him/her quit
  - e. Tell him/her it is alright to feel that way, but help him/her find other ways of expressing himself/herself.

10. When my child would prefer to do things with his/her friends rather than with his family, I would:
  - a. Encourage him/her to do things with his/her friends
  - b. Accept this as part of growing up
  - c. Plan special activities so that s/he will want to be with the family
  - d. Try to minimize his/her association with his/her friends
  - e. Make him/her stay with his/her family
11. When my child would disagree with me about something which I think is important, it would:
  - a. Make me feel like punishing him/her
  - b. Please me that s/he feels free to express himself/herself
  - c. Make me feel like persuading him/her that I am right
  - d. Make me realize s/he has ideas of his/her own
  - e. Make me feel annoyed
12. When my child would misbehave while others in the group s/he is with are behaving well, it would:
  - a. Make me realize that s/he does not always behave as others in his/her group
  - b. Make me feel embarrassed
  - c. Make me want to help him/her find the best ways to express his/her feelings
  - d. Make me wish s/he would behave like the others
  - e. Make me want to know more about his/her feelings
13. When my child would be shouting and dancing with excitement at a time when I want peace and quiet, I would:
  - a. Give him/her something quiet to do
  - b. Tell him/her that I wish s/he would stop
  - c. Make him/her be quiet
  - d. Let him/her tell me about what excites him/her
  - e. Send him/her somewhere else
14. When my child would seem to be more fond of someone else (teacher, friend, relative) than me, I would:
  - a. Try to minimize his/her association with that person
  - b. Let him/her have such associations when I think s/he is ready for them
  - c. Do some special things for him/her to remind him/her of how nice I am
  - d. Point out the weaknesses and faults of that other person
  - e. Encourage him/her to create and maintain such associations
15. When my child would say angry and hateful things about me to my face, it would
  - a. Make me feel annoyed
  - b. Make me feel that I will be glad when s/he is past this stage
  - c. Please me that s/he feels free to express himself/herself
  - d. Make me feel like punishing him/her
  - e. Make me feel like telling him/her not to talk to me that way
16. When my child would show a deep interest in something I don't think is important, it would:
  - a. Make me realize s/he has interests of his/her own
  - b. Make me want to help him/her find ways to make the most of this interest
  - c. Make me feel disappointed in him/her
  - d. Make me want to know more about his/her interests
  - e. Make me wish s/he were more interested in things I think are important for him/her

17. When my child would be unable to do some things as well as others in his group, I would:
  - a. Tell him/her s/he must try to do as well as the others
  - b. Encourage him/her to keep trying
  - c. Tell him/her that no one can do everything well
  - d. Call his/her attention to the things s/he does well
  - e. Help him/her make the most of the activities which s/he can do
18. When my child would want to do something which I am sure will lead to disappointment for him/her, I would:
  - a. Occasionally let him/her carry such an activity to its conclusion
  - b. Don't let him/her do it
  - c. Advise him/her not to do it
  - d. Help him/her with it in order to ease the disappointment
  - e. Point out what is likely to happen
19. When my child would act silly and giggly, it would:
  - a. Make me feel that I will be glad when s/he is past this stage
  - b. Please me that s/he feels free to express himself/herself
  - c. Make me feel like punishing him/her
  - d. Make me feel like telling him/her to stop
  - e. Make me feel annoyed
20. When my child would be faced with two or more choices and has to choose only one, it would:
  - a. Make me feel that I should tell him/her which choice to make and why
  - b. Make me feel that I should point out the advantages and disadvantages of c:
  - c. Make me hope that I have prepared him/her to choose wisely
  - d. Make me want to encourage him/her to make his own choice
  - e. Make me want to make the decision for him/her
21. When my child would be unable to do something which I think is important for him/her, I would:
  - a. Tell him/her s/he must do better
  - b. Help him/her make the most of the things which s/he can do
  - c. Ask him/her to tell me more about the things which s/he can do
  - d. Tell him/her that no one can do everything
  - e. Encourage him/her to keep trying
22. When my child would disagree with me about something which I think is important, I would:
  - a. Tell him/her s/he shouldn't disagree with me
  - b. Make him/her quit
  - c. Listen to his/her side of the problem and change my mind if I am wrong
  - d. Tell him/her maybe we can do it his/her way another time
  - e. Explain that I am doing what is best for him/her
23. When my child would be unable to do some things as well as others in his/her group, it would:
  - a. Make me realize that s/he can't be best in everything
  - b. Make me wish s/he could do as well
  - c. Make me feel embarrassed
  - d. Make me want to help him/her find success in the things s/he can do
  - e. Make me want to know more about the things s/he can do well

24. When my child would make decisions without consulting me it would:
  - a. Make me hope that I have prepared him/her adequately to make his/her decisions
  - b. Make me wish s/he would consult me
  - c. Make me feel disturbed
  - d. Make me want to restrict his/her freedom
  - e. Please me to see that as s/he grows s/he needs me less
25. When my child would say angry and hateful things about me to my face, I would:
  - a. Tell him/her it's all right to feel that way, but help him/her find other ways to express himself/herself
  - b. Tell him/her I know how s/he feels
  - c. Pay no attention to him/her
  - d. Tell him/her s/he shouldn't say such things to me
  - e. Make him/her quit
26. When my child would kick, hit and knock his things about, I would:
  - a. Make him/her quit
  - b. Tell him/her it is all right to feel that way, but help him/her find other ways of expressing himself/herself
  - c. Tell him/her s/he shouldn't do such things
  - d. Tell him/her I know how s/he feels
  - e. Pay no attention to him/her
27. When my child would prefer to do things with his friends rather than with his family, it would:
  - a. Make me wish s/he would spend more time with us
  - b. Make me feel resentful
  - c. Please me to see his/her interests widening to other people
  - d. Make me feel s/he doesn't appreciate us
  - e. Make me realize that s/he is growing up
28. When my child would want to do something which I am sure will lead to disappointment for him/her, it would:
  - a. Make me hope that I have prepared him/her to meet disappointment
  - b. Make me wish s/he didn't have to meet unpleasant experiences
  - c. Make me want to keep him/her from doing it
  - d. Make me realize that occasionally such an experience will be good for him
  - e. Make me want to postpone these experiences
29. When my child would be disinterested in some of the usual activities of his/her age group, I would:
  - a. Try to help him/her realize that it is important to be interested in the same things as others in his/her group
  - b. Call his/her attention to the activities in which s/he is interested
  - c. Tell him/her it is alright if s/he isn't interested in the same things
  - d. See to it that s/he does the same things as others in his/her group
  - e. Help him/her find ways of making the most of his/her interests
30. When my child would show a deep interest in something I don't think is important, I would:
  - a. Let him/her go ahead with his/her interest
  - b. Ask him/her to tell me more about this interest
  - c. Help him/her find ways to make the most of this interest
  - d. Do everything I can to discourage his/her interest in it
  - e. Try to interest him/her in more worthwhile things



## APPENDIX F

### ON-TASK/OFF-TASK OBSERVATION FORM

## ON-TASK/OFF-TASK OBSERVATION FORM

One interval = 15 seconds

	On-Task	Off-Task		On-Task	Off-Task
Interval 1			Interval 21		
Interval 2			Interval 22		
Interval 3			Interval 23		
Interval 4			Interval 24		
Interval 5			Interval 25		
Interval 6			Interval 26		
Interval 7			Interval 27		
Interval 8			Interval 28		
Interval 9			Interval 29		
Interval 10			Interval 30		
Interval 11			Interval 31		
Interval 12			Interval 32		
Interval 13			Interval 33		
Interval 14			Interval 34		
Interval 15			Interval 35		
Interval 16			Interval 36		
Interval 17			Interval 37		
Interval 18			Interval 38		
Interval 19			Interval 39		
Interval 20			Interval 40		

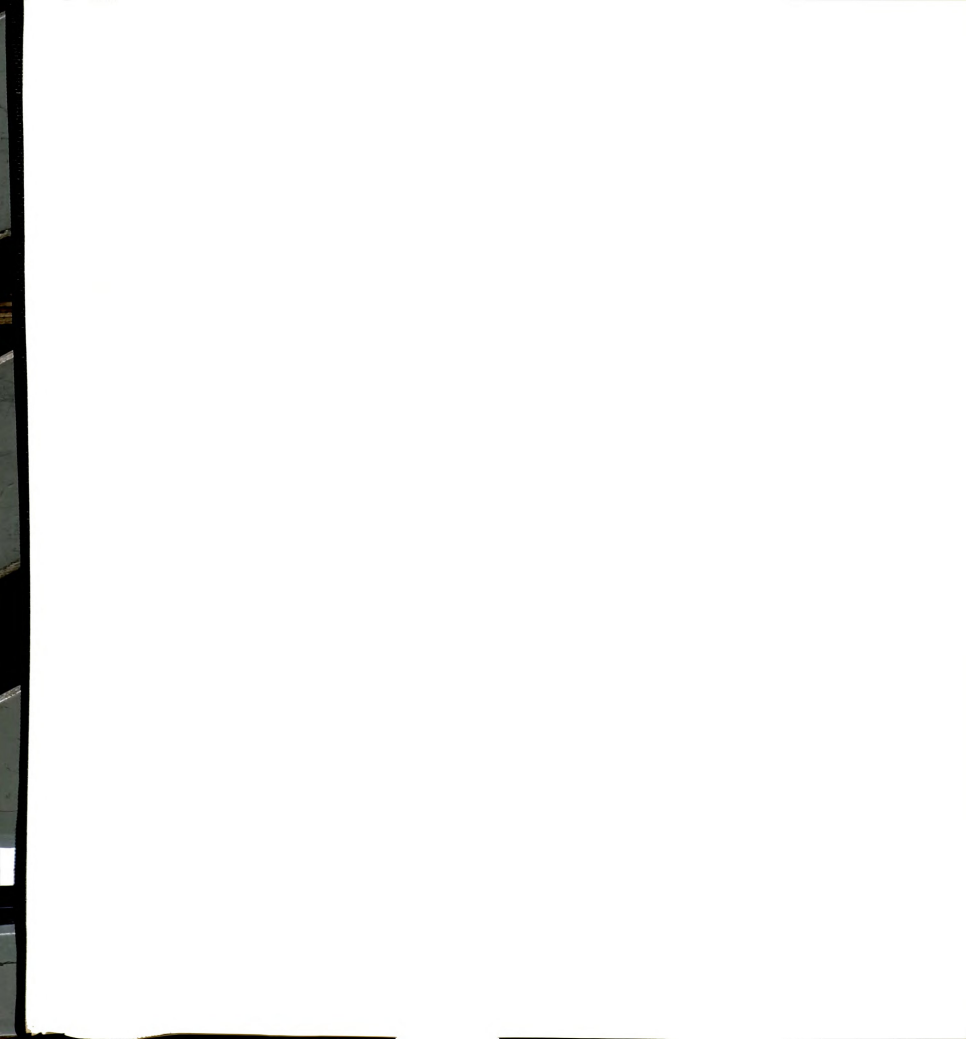
## REFERENCES



## REFERENCES

- Abikoff, H., Gittelman-Klein, R., & Klein, D. (1977). Validation of a classroom observation code for hyperactive children. Journal of Consulting and Clinical Psychology, 45, 772-783.
- Abrams, A. L. (1968). Delayed and irregular maturation versus minimal brain injury. Clinical Pediatrics, 7, 344-349.
- Ainsworth, M. D. (1973). The development of infant-mother attachment. In B. Caldwell & H. Ricciuti (Eds.), Review of child development research (Vol. 3). Chicago: University of Chicago Press.
- Aman, M. G., & Turbott, S. H. (1986). Incidental learning, distraction and sustained attention in hyperactive and control subjects. Journal of Abnormal Child Psychology, 14, 441-445.
- Aub, J. C., Fairhall, L. T., Minor, A. S., & Resnikoff, P. (1926). Lead poisoning. Baltimore, MD: Williams & Wilkins.
- Bakwin, H., & Bakwin, R. M. (1966). Clinical management of behavior disorders. Philadelphia, PA: Saunders.
- Bandura, A. (1981). Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. Ross (Eds.), Social cognitive development: Frontiers and possible futures. Cambridge: Cambridge University Press.
- Bandura, A. (1982, February). Self-efficacy mechanism in human agency. American Psychologist, 37(2), 122-147.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.
- Barker, G. P., & Graham, S. (1987). A developmental study of praise and blame on attributional cues. Journal of Educational Psychology, 19(1), 62-66.
- Barkley, R. A. (1981). Hyperactive children: A handbook for diagnosis and treatment. New York: New Guilford Press.

- Barkley, R. A. (1982). Guidelines for defining hyperactivity in children: Attention deficit disorder with hyperactivity. In B. B. Lahey & A. E. Kazdin (Eds.), Advances in clinical child psychology (Vol. 5, pp. 137-180). New York: Plenum Press.
- Battle, E. S. (1965). Motivational determinants of academic competence. Journal of Personality and Social Psychology, 2, 209-213.
- Battle, E. S., & Lacey, B. A. (1972). Context for hyperactivity in children, over time. Child Development, 43, 757-773.
- Baumrind, D. (1971). Current patterns of parental authority. Developmental Psychology Monograph, 4 (pt. 2).
- Bax, M. (1972). The active and overactive school child. Developmental Medicine and Child Neurology, 14, 83-86.
- Becker, J. W. (1971). Achievement motivation: An analysis of the literature. M. Chapman & R. Hill (Eds.). Research for Better Schools.
- Bennett, F. C., & Sherman, R. (1983). Management of childhood "hyperactivity" by primary care physicians. Journal of Developmental and Behavioral Pediatrics, 4, 88-93.
- Bettelheim, G. (1973). Bringing up children. Ladies Home Journal, 90, 28.
- Boxerman, D., & Spilken, A. (1975). Alpha brain waves. Millbrae, CA: Celestial Arts.
- Bradley, C. (1957). Characteristics and management of children with behavior problems associated with brain damage. Pediatric Clinics of North America, 4, 1049-1060.
- Broadbent, D. E. (1953). Classical conditioning and human watch-keeping. Psychological Review, 60, 331-339.
- Broadbent, D. E. (1977). The hidden preattentive process. American Psychologist, 32, 109-118.
- Broadbent, D. (1987). Structures and strategies: Where are we now? Psychological Research, 49(2/3), 73-79.
- Brophy, J., & Willis, S. (1981). Human development and behavior. New York: St. Martin's Press.
- Butler, H. J., & Lapierre, Y. D. (1974). The effect of methylphenidate on sensory perception and integration in hyperactive children. International Pharmacopsychiatry, 9, 235-244.



- Cantwell, D. P. (1972). Psychiatric illness in the families of hyperactive children. Archives of General Psychiatry, 27, 414-417.
- Cantwell, D. P. (1975). The hyperactive child's diagnosis and management: Current research. New York: Spectrum Publications.
- Caudill, W. A. (1972). Tiny dramas: Vocal communication between mother and infant in Japanese and American families. In W. P. Lebra (Ed.), Mental Health Research (Vol. 2). Honolulu: East-West Center Press.
- Cohen, M., DuRant, R. H., & Cook, Carmen. (1988, April). The Conner's Teacher Rating Scale: Effects of age, sex, and race with special education children. Psychology in the Schools, 25.
- Condry, J. (1977). Enemies of exploration: Self-initiated versus other-initiated learning. Personality and Social Psychology, 35(7), 459-477.
- Connors, C. K. (1970). Symptom patterns in hyperkinetic, neurotic and normal children. Child Development, 41, 476-483.
- Csikszentmihalyi, M. (1975). Beyond boredom and anxiety. San Francisco: Jossey-Bass, 1975.
- David, O., Clark, J., & Voeller, K. (1972). Lead and hyperactivity. Lancet, 2, 900-903.
- Davies, D. R., & Parasuraman, R. (1982). The psychology of vigilance. New York: Academic Press.
- DeCharms, R. (1976). Enhancing motivation: Change in the classroom. New York: Irvington Publishers.
- Deci, E. L., & Ryan, R. M. (1971). The General Causality Orientations Scale: Self-determination in personality. Journal of Research in Personality, 19, 109-134.
- DeLoache, J. S. (1976). Rate of habituation and visual memory in infants. Child Development, 47, 145-154.
- Denson, R., Nanson, J. L., & McWatters, M. A. (1975). Hyperkinesis and maternal smoking. Canadian Psychiatric Association Journal, 20, 183-187.



- Doyle, A. A. (1973). Listening to distraction: A developmental study of selective attention. Journal of Experimental Child Psychology, 15, 100-115.
- Dubey, D. R., O'Leary, S. G., & Kaufman, K. F. (1983). Training of parents of hyperactive children in child management: A comparative outcome study. Journal of Abnormal Child Psychology, 11, 229-246.
- Dykman, R. A., Ackerman, P. T., & Holcomb, P. J. (1984, August 24-28). Reading disabled and ADD children: Similarities and differences. Paper presented at the 92nd annual conference of the American Psychological Association, Toronto, Canada.
- Ebaugh, F. G. (1923). Neuropsychiatric sequelae of acute epidemic encephalitis in children. American Journal of Diseases of Children, 25, 89-97.
- Fantz, R. L. (1964). Visual experience in infants: Decreased attention to familiar patterns relative to novel ones. Science, 146, 668-670.
- Farham-Diggory, N., & Ramsey, B. (1971). Play persistence: Some effects of interruptions, social reinforcement, and defective toys. Developmental Psychology, 4(2), 297-298.
- Feingold, B. F. (1975). Hyperkinesis and learning disabilities linked to artificial food flavors and colors. American Journal of Nursing, 75, 797-803.
- Firestone, P., & Peters, S. (1983, December). Minor physical anomalies and behavior in children: A review. Journal of Autism and Developmental Disorders, 13, 411-425.
- FitzGerald, P., Tattersall, A., & Broadbent, D. (1988). Separating central mechanism by POC's evidence for an output buffer. Quarterly Journal of Experimental Psychology, 40, 109-134.
- Friedman, R. J., & Doyal, G. T. (1982). The hyperactive child. Danville, IL: Interstate Printers & Publishers.
- Frey, A. H. (1965). Behavioral biophysics. Psychological Bulletin, 63, 322-357.
- Gadow, H., & Sprague, R. L. (1980, September). An anterospective follow-up study of hyperactive children into adolescence: Licit and illicit drug use. Paper presented at the meeting of the American Psychological Association, Montreal.
- Gelfand, C. C. (1973). The effects of an altered interpersonal environment on minimally brain-damaged children. Dissertation Abstracts International, 34B, 1270-1275.

- Gibson, E. H., & Rader, N. (1979). The perceiver as performer. In G. A. Hale & M. Lewis (Eds.), Attention and cognitive development. New York: Plenum.
- Gracinin, C. T., & Cook, J. E. (1977). Alpha biofeedback and L.D. children. Academic Therapy, 12(3), 275-279.
- Greer, J. G., & Wethered, C. E. (1984, April). Learned helplessness: A piece of the burnout puzzle. Exceptional Children, 50(6).
- Hagen, J. W., & Hale, G. A. (1973). The development of attention in children. In A. D. Peck (Ed.), Minnesota symposia on child psychology (Vol. 7). Minneapolis: University of Minnesota Press.
- Hale, G. A., & Green, R. Z. (1976). Children's attention to stimulus components with variation in relative salience of components and degree of stimulus integration. Journal of Experimental Child Psychology, 21, 446-459.
- Hallahan, D. P., Gajar, A., Cohen, S., & Tarver, S. (1978, April). Selective attention and locus of control in learning disabled and normal children. Journal of Learning Disabilities, 11(4), 47-54.
- Hallahan, D. P., Kauffman, J. M., & Ball, D. S. (1973). Selective attention and cognitive tempo of low achieving and high achieving sixth grade males. Perceptual Motor Skills, 36, 579-583.
- Hartsough, C. S., & Lamber, N. M. (1987). Patterns and progression of drug use among hyperactives and controls: A prospective short-term longitudinal study. Journal of Child Psychology and Psychiatry, 28(4), 543-553.
- Harter, S., & Pike, R. (1981). The pictorial scale of perceived competence and social acceptance for young children. Child Development, 55, 1969-1982.
- Hartley, E. R. (1974). Radiation that's good for you. Science Digest, 76, 39-45.
- Head, H. (1923). The conception of nervous and mental Energy: II. Vigilance: A physiological state of the nervous system. British Journal of Psychology, 14.
- Hebb, D. O. (1955). Drives and the D.N.S. (conceptual nervous system). Psychological Review, 62, 243-254.

- Henry, R. C. (1979). Predicting television viewing behavior in elementary school children: A test of self-efficacy theory. Unpublished doctoral dissertation, Michigan State University.
- Hiroto, D. S. (1974). Locus of control and learned helplessness. Journal of Experimental Psychology, 102, 187-193.
- Hirst, W. (1986). Attend to this. Contemporary Psychology, 31(2), 116-118.
- Huessy, H. R., & Cohen, A. H. (1976). Hyperkinetic behaviors and learning disabilities followed over seven years. Pediatrics, 57, 4-10.
- Irwin, D. M., & Bushnell, M. M. (1980). Observational strategies for child study. New York: Holt, Rinehart & Winston.
- James, W. (1899). The principles of psychology. New York: Henry Holt.
- Jencks, C. (1973). Inequality--A reassessment of the effect of family and schooling in America. New York: Harper & Row.
- Jerison, H. J. (1970). Vigilance: A paradigm and some physiological speculations. In A. T. Sanders (Ed.), Attention and performance III (pp. 367-380).
- Jones, K. L., Smith, D. W., Streissguth, A. P., & Myrianthopoulos, N. C. (1974). Outcome in offspring of chronic alcoholic women. Lancet, 1, 1976-1978.
- Keele, S. W. (1978). Attention in human performance. Pacific Palisades, CA: Goodyear.
- Kinchia, R. A. (1980). The measurement of attention. In R. S. Nickerson (Ed.), Attention and human performance VIII (pp. 213-238). Hillsdale, NJ: Erlbaum.
- Kinsbourne, M., & Caplan, P. (1979). Children's learning and attention problems. Boston: Little, Brown.
- Kinsbourne, M., & Swanson, P. (1985). Developmental aspects of selective orientation. In G. Hale & M. Lewis (Eds.), Attention and cognitive development (pp. 119-134). New York: Plenum.
- Klein, R. (1980). Does oculomotor readiness mediate cognitive control of visual attention? In R. S. Nickerson (Ed.), Attention and human performance VIII (pp. 259-276). Hillsdale, NJ: Erlbaum.

- Kramer, J., & Loney, J. (1982). Childhood hyperactivity and substance abuse: A review of literature. In K. D. Gadow & I. Bialer (Eds.), Advances in learning and behavioral disabilities (Vol. 1). Greenwich, CN: J. A. I. Press.
- Kupietz, S., & Richardson, E. (1978). Children's vigilance, performance and inattentiveness in the classroom. Journal of Child Psychology and Psychiatry, 19, 145-154.
- Lanham, B. B. (1966). The psychological orientation of the mother-child relationship in Japan. Monumenta Nipponica, 21, 322-333.
- Lefcourt, H. M. (1966). Internal versus external control of reinforcement: A review. Psychological Bulletin, 65, 206-220.
- Lefcourt, H. M. (1976). Locus of control: Current trends in theory and research. Hillsdale, NJ: Erlbaum.
- Leicht, D. J., O'Donnell, J. P., Phillips, F. L., & Marnett, J. P. (1984, May 3-5). Prediction of childhood behavior problems over a four-year period. Paper presented at the annual meeting of the Midwest Psychological Association, Chicago, IL.
- Lepper, M. (1983). Extrinsic reward and intrinsic motivation: Implications for the classroom. In J. M. Levine & M. C. Wang (Eds.), Teacher and student perceptions: Implications for learning. Hillsdale, NJ: Erlbaum.
- Lewis, M., & Baldini, D. (1979). A review of models of attention and memory. In G. A. Hale & M. Lewis (Eds.), Attention and cognitive development. New York: Plenum.
- Levy, F. (1980). The development of sustained attention (vigilance) and inhibition in children: Some normative data. Journal of Child Psychology and Psychiatry, 21, 77-84.
- Maehr, M. (1976, Fall). Continuing motivation: An analysis of a seldom considered educational outcome. Review of Educational Research, 46(3), 443-462.
- Maehr, M., & Stallings, W. M. (1972). Freedom from external evaluation. Child Development, 43, 177-185.
- McNamara, J. J. (1972). Hyperactivity in the apartment bound child. Clinical Pediatrics, 11, 371-372.
- Milich, R., & Pelham, W. (1986). Effects of sugar ingestion on the classroom and playgroup behavior of attention deficit disordered boys. Journal of Consulting and Clinical Psychology, 5, 714-718.

- Minde, K., Lewin, O., Weiss, G., Lavigueur, H., Douglas, V., & Sykes, E. (1971). The hyperactive child in the elementary school: A five-year controlled follow-up study. Exceptional Child, 38, 215-219.
- Mischel, W., & Moore, B. (1973). Effects of attention symbolically presented rewards on self-control. Journal of Personality and Social Psychology, 28, 172-179.
- Mischel, W., & Zeiss, A. (1974). Internal-external control and persistence: Validation and implications of the Stanford Preschool Internal-External Scale. Journal of Personality and Social Psychology, 29, 265-278.
- Morrison, J. R., & Stewart, M. (1971). A family study of the hyperactive child syndrome. Biological Psychiatry, 3, 187-195.
- Morsbach, H. (1978, December 20). Socio-psychological aspects of persistence in Japan. The Japan Times, p. 7.
- Moyer, K. E. (1975). Allergy and aggression: The physiology of violence. Psychology Today, 9, 76-79.
- Mulholland, T. (1971). Can you really turn on with alpha? Paper presented at the meeting of the Massachusetts Psychological Association, Boston, MA.
- Nall, A. (1978, Fall). Alpha training and the hyperkinetic child-- Is it effective? Academic Therapy, 9(1), 5-20.
- Navon, D., Sukenik, M., & Norman, J. (1987). Is attention allocation sensitive to word informativeness? Psychological Research, 49, 131-137.
- Neddleman, H. L., Gunnoe, C., Leviton, A., Reed, R., Peresie, H., Maher, C., & Barret, B. S. (1979). Deficits in psychological and classroom performance of children with elevated dentine lead levels. New England Journal of Medicine, 300(13), 689-695.
- Nelson-Le Gall, S., & Scott-Jones, D. (1983, April 11-14). Teachers' and young children's perception of task persistence. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.
- Niesser, U. (1981). The concept of intelligence. Intelligence, 3, 217-227.
- Norman, D. A., & Babrow, D. G. (1976). On the role of active memory processes to perception and cognition. In C. N. Cafer (Ed.), The structure of human memory. San Francisco: W. H. Freeman.

- Nunnally, J. C., & Lemond, L. C. (1973). Explanatory behavior and human development. In H. W. Reise (Ed.), Advances in Child Development and Behavior (Vol. 8, pp. 60-109). New York: Academic.
- O'Leary, D. K. (1984). Mommy, I can't sit still: Coping with hyperactive and aggressive children. New York: New Horizon Press.
- O'Leary, D. K., Rosenbaum, A., & Hughes, P. C. (1978). Fluorescent lighting: A purported source of hyperactive behavior. Journal of Abnormal Child Psychology, 6, 285-289.
- O'Malley, J., & Eisenberg, L. (1973). The hyperkinetic syndrome. Seminars in Psychiatry, 5, 95-103.
- Palfrey, J. S., Levine, M., Oberklaid, F., Lerner, M., & Aufuser, C. (1981). Journal of Pediatrics, 98(6), 1006-1011.
- Palkes, H., & Stewart, M. (1975). Intellectual ability and performance of hyperactive children. American Journal of Orthopsychiatry, 42, 35-39.
- Paternite, C. E., Loney, J., & Longhorne, J. E., Jr. (1976). Relationships between symptomatology and SES-related factors in hyperkinetic MBD boys. American Journal of Orthopsychiatry, 46, 291-301.
- Pernell, E., Jr. (1984, Summer). The influence of race and social behavior on teachers: Recommendations for special services. Michigan Association of Teachers of Emotionally Disturbed Children Information Bulletin, 2(1).
- Pillsbury, W. B. (1973). Attention. New York: Arno.
- Piontrowski, D., & Calfee, R. (1979). Attention in the classroom. In G. Hale & M. Lewis (Eds.), Attention and cognitive development (pp. 297-329). New York: Plenum.
- Porges, S., & Ward, K. S. (1980). Defining hyperactivity: Psychophysiological and behavioral Strategies. In C. B. Whalen & B. Henker (Eds.), Hyperactive children: The social ecology of identification and treatment (pp. 75-104). New York: Academic.
- Porter, B. M. (1954, March). Measurement of parental acceptance of children. Journal of Home Economics, pp. 176-182.

- Quay, H. C., & Peterson, D. R. (1967). Manual for the Behavior Problem Checklist. Champaign: Children's Research Center, University of Illinois.
- Rholes, W. S., Backwell, C. J., & Walters, C. (1980). A developmental study of learned helplessness. Developmental Psychology, 16(6), 616-624.
- Richardson, G. A., & McCluskey, R. A. (1983). Subject loss in infancy research: How biasing is it? Infant Behavior and Development, 6, 235-239.
- Robin, S., & Bosco, J. (1981). Parent, teacher, and physician in the life of the hyperactive child. Springfield, IL: Charles E. Thomas.
- Rosenthal, R. H., & Allen, T. W. (1980). Intratask distractibility in hyperkinetic and nonhyperkinetic children. Journal of Abnormal Child Psychology, 8, 175-187.
- Ross, A. C. (1976). Psychological aspects of learning disabilities and reading disorders. New York: McGraw-Hill.
- Ross, D., & Ross, S. (1976). Hyperactivity: Research, theory, and action. New York: John Wiley & Sons.
- Rotter, J. B. (1954). Social learning and clinical psychology. Englewood Cliffs, NJ: Prentice-Hall.
- Rotter, J. B., Seeman, M., & Liverant, S. (1962). Internal versus external control of reinforcements: A major variable in behavior theory. In N. F. Washburn (Ed.), Decisions, values and groups (Vol. 2). London: Pergamon.
- Rutschmann, D., Cornblatt, B., & Erichmeyer-Kimling, J. (1977, May). Disturbed attention in children at risk for schizophrenia. Archives of General Psychiatry, 56.
- Satterfield, J. H., Cantwell, D. P., Lesser, L., & Podosin, R. L. (1972, May). Physiological studies of hyperkinetic children. American Journal of Psychiatry, 128, 11.
- Satterfield, J. H., Cantwell, D. P., Saul, R. E., Lesser, L. I., & Podosin, R. L. (1973). Response to stimulant drug treatment in hyperactive children: Prediction from EEG and neurological findings. Journal of Autism and Childhood Schizophrenia, 3(1), 36-48.
- Sattler, J. M. (1982). Assessment of children's intelligence and special abilities. Boston: Allyn & Bacon.

- Schrag, P., & Divoky, D. (1975). The myth of the hyperactive child. New York: Dell.
- Seligman, M. E., Kaslow, N. J., Allay, L. B., Peterson, C., Tanenbaum, R. L., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. Journal of Abnormal Psychology, 93, 235-238.
- Shigaki, I. S. (1983, May). Child care practices in Japan and the United States: How do they reflect cultural values in young children? Young Children, 38(4), 13-24.
- Sleator, E. K., & Von Neumann, A. (1974). Methylphenidate in the treatment of hyperkinetic children. Clinical Pediatrics, 13, 19-24.
- Sprague, R. L., & Toppe, L. K. (1966). Relationship between activity level and delay of reinforcement in the retarded. Journal of Experimental Child Psychology, 3, 390-397.
- Stearn, J. (1976). The power of alpha-thinking--Miracle of the mind. New York: William Morrow.
- Still, G. F. (1902). The Coulstonian lectures on some abnormal physical conditions in children. Lancet, 1, 1008-1012, 1077-1082, 1163-1168.
- Strauss, A. A., & Kephart, N. C. (1955). Psychopathology and education of the brain injured child: Vol. II. Progress in theory and clinic. New York: Grune & Stratton.
- Sullivan, E. A. (1975). The future: Human ecology and education. Homewood, IL: ETC Publications.
- Titchener, E. B. (1908). Lectures on the elementary psychology of feelings and attention. New York: Macmillan.
- Trabasso, T. H., & Bower, G. A. (1968). Attention in learning: Theory and research. New York: Wiley.
- Vurpillot, E., & Ball, W. A. (1979). The concept of identity and children's selective attention. In G. A. Hale & M. Lewis (Eds.), Attention and cognitive development (pp. 23-42). New York: Plenum Press.
- Wachs, T. D., & Smitherman, C. H. (1985, August). Infant temperament and subject loss in a habituation procedure. Child Development, 56, 861-867.



- Wachs, T. D., Uzgiris, I. C., & McVickers-Hunt, J. (1971). Cognitive development in infants of different age levels and from different environmental backgrounds: An exploratory investigation. Merrill Palmer Quarterly, 17, 283-317.
- Wallander, J. L. (1988, January). The relationship between attention problems in childhood and antisocial behavior eight years later. Journal of Child Psychology and Psychiatry, 29(1), 53-61.
- Walker, H. M. (1985). Teacher behavior standards and expectations as determinants of classroom ecology, teacher behavior, and child outcome. Eugene: University of Oregon, Center for Educational Policy and Management.
- Warm, J. S. (1984). An introduction to vigilance. In J. S. Warm (Ed.), Sustained attention in human performance. Chichester: Wiley.
- Weiner, A. S., & Bergonsky, M. D. (1975). Development of selective attention in reflective and impulsive children. Child Development, 46, 545-551.
- Weiner, B. (1984). Principles for a theory of student motivation and their application within an attributional framework. In R. E. Ames & C. Ames (Eds.), Research in motivation in education (Vol. 1, pp. 15-38).
- Weiner, B., & Kukla, A. (1970). An attributional analysis of achievement motivation. Journal of Personality and Social Psychology, 15, 1-120.
- Weithorn, C. J. (1970). The relationship between hyperactivity and impulsive responsiveness in elementary school children. Dissertation Abstracts International, 30B, 3899.
- Wender, P. H. (1971). Minimal brain dysfunction in children. New York: Wiley Interscience.
- Wender, P. H., Reimherr, F. W., & Woods, D. (1981, April). Attention deficit disorder in adults. Archives of General Psychiatry, 38.
- Whalen, C. K., & Henker, B. (Eds.). (1981). Hyperactive children: The social ecology of identification and treatment. New York: Academic.
- Wohlwill, J. F., & Heft, H. (1977). Environment's fit for the developing child. In H. McGurk (Ed.), Ecological factors in human development. Amsterdam: North Holland.

- Zentall, S. E. (1975). Optimal stimulation as theoretical basis of hyperactivity. American Journal of Orthopsychiatry, 45, 549-583.
- Zentall, S. E. (1977). Environmental stimulation model. Exceptional Children, 43, 502-510.
- Zentall, S. E., & Zentall, T. R. (1976). Activity and task performance of hyperactive children as a function of environmental stimulation. Journal of Consulting and Clinical Psychology, 44, 693-697.
- Zentall, S. E., Zentall, T. R., & Barack, R. C. (1978, November). Distraction as a function of within-task stimulation for hyperactive and normal children. Journal of Learning Disabilities, 2(9), 13-21.



MICHIGAN STATE UNIV. LIBRARIES



31293005506617